MAC

COMMONWEALTH OF MASSACHUSETTS

CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	609409-133236
P.V. =	$51,304,000.00
PLANS	YES

FOR

Federal Aid Project No. HIP(NGB)-003S(924)
Bridge Replacement, S-24-016, Armory Street over CSX Mainline
& S-24-026, Armory Street over Abandoned CSX

in the City of

SPRINGFIELD

In accordance with the STANDARD SPECIFICATIONS
for HIGHWAYS and BRIDGES dated 2025

This Proposal to be opened and read: **TUESDAY, MARCH 17, 2026 at 2:00 P.M.**

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DOCUMENT 00104

NOTICE TO CONTRACTORS

Electronic proposals for the following project will be received through the internet using www.bidx.com until the date and time stated below and will be posted on www.bidx.com forthwith after the bid submission deadline. No paper copies of bids will be accepted. All Bidders must have a valid vendor code issued by MassDOT in order to bid on projects. Bidders need to apply for a Digital ID at least 14 days prior to a scheduled bid opening date with www.bidx.com.

TUESDAY, MARCH 17, 2026 at 2:00 P.M. **
SPRINGFIELD
Federal Aid Project No. HIP(NGB)-003S(924)
Bridge Replacement, S-24-016, Armory Street over CSX Mainline
& S-24-026, Armory Street over Abandoned CSX

****Date Subject to Change**

PROJECT VALUE = $51,304,000.00

Bidders must be pre-qualified by the Department in the BRIDGE - CONSTRUCTION category to bid on the above project. An award will not be made to a Contractor who is not pre-qualified by the Department prior to the opening of Proposals.

All prospective Bidders who intend to bid on this project must obtain "Request Proposal Form (R109)". The blank "Request Proposal Form (R109)" can be obtained at: https://www.mass.gov/prequalification-of-horizontal-construction-firms.

All prospective Bidders must complete and e-mail an electronic copy of "Request Proposal Form (R109)" to the MassDOT Director of Prequalification for approval: prequal.r109@dot.state.ma.us.

Proposal documents for official bidders are posted on www.bidx.com. Other interested parties may receive informational Contract Documents containing the Plans and Special Provisions, free of charge.

Bids will be considered, and the contract awarded in accordance with statutes governing such contracts in accordance with Massachusetts General Laws Chapter 30 § 39M.

The Project Bids File Attachments folder for proposals at www.bidx.com shall be used for submitting at the time of bid required information such as the Bid Bond required document, and other documents that may be requested in the proposal.

NOTICE TO CONTRACTORS (Continued)

All parties who wish to have access to information plans and specification must send a "Request for Informational Documents" to MassDOTBidDocuments@dot.state.ma.us.

A Proposal Guaranty in the amount of 5% of the value of the bid is required.

This project is subject to the schedule of prevailing wage rates as determined by the Commissioner of the Massachusetts Department of Labor and Workforce Development, and the Division of Occupational Safety, and the United States Department of Labor.

The Massachusetts Department of Transportation, in accordance with Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby affirmatively ensures that for any contract entered into pursuant to this advertisement, all bidders, including disadvantaged business enterprises, will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration for an Award.

This Proposal contains the "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)". The goals and timetables applicable to this proposal for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all work, are contained in Appendices A and B-80 of the above specifications.

The Contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract as contained in Appendices C and D of the above specifications.

NOTICE TO CONTRACTORS (Continued)

PRICE ADJUSTMENTS

This Contract contains price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel, and gasoline. For reference the base prices are as follows: liquid asphalt $615.00 per ton, Portland cement $425.13 per ton, diesel fuel $2.805 per gallon, and gasoline $2.145 per gallon, and Steel Base Price Index 373.6. MassDOT posts the **Price Adjustments** on their Highway Division's website at
https://www.mass.gov/massdot-contract-price-adjustments

This Contract contains Price Adjustments for steel. See Document 00813 - PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL for their application and base prices.

MassDOT projects are subject to the rules and regulations of the Architectural Access Board (521 CMR 1.00 et seq.)

Prospective bidders and interested parties can access this information and more via the internet at WWW.COMMBUYS.COM.

BY: Phillip Eng, Interim MassDOT Secretary
Jonathan L. Gulliver, Undersecretary and Highway Administrator
SATURDAY, DECEMBER 20, 2025

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DOCUMENT 00210

REQUIREMENTS OF MASSACHUSETTS GENERAL LAWS
CHAPTER 30, SECTION 39R;s
CHAPTER 30, SECTION 39O

July 1, 1981, updated October 2016

M.G.L. c. 30, § 39R. Award of Contracts; Accounting Statements; Annual Financial Statements; Definitions.

(a) The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) “Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

(2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive, of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars.

(3) “Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

(4) “Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

(5) “Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(6) "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

(7) “Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.

(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and

(2) Until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and

(3) If the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his description the date of the change and reasons therefor, and shall accompany said description with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(4) If the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and

(5) If the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and its subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

(2) transactions are recorded as necessary

i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. to maintain accountability for assets;

(3) access to assets is permitted only in accordance with management's general or specific authorization; and

(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request.

(e) The office of inspector general, the commissioner of capital asset management and maintenance and any other awarding authority shall enforce the provisions of this section. The commissioner of capital asset management and maintenance may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

M.G.L. c. 30, § 39O: Suspension, Delay, or Interruption or Failure to Act by Awarding Authority; Adjustment in Contract Price; Submission of Claims.

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.

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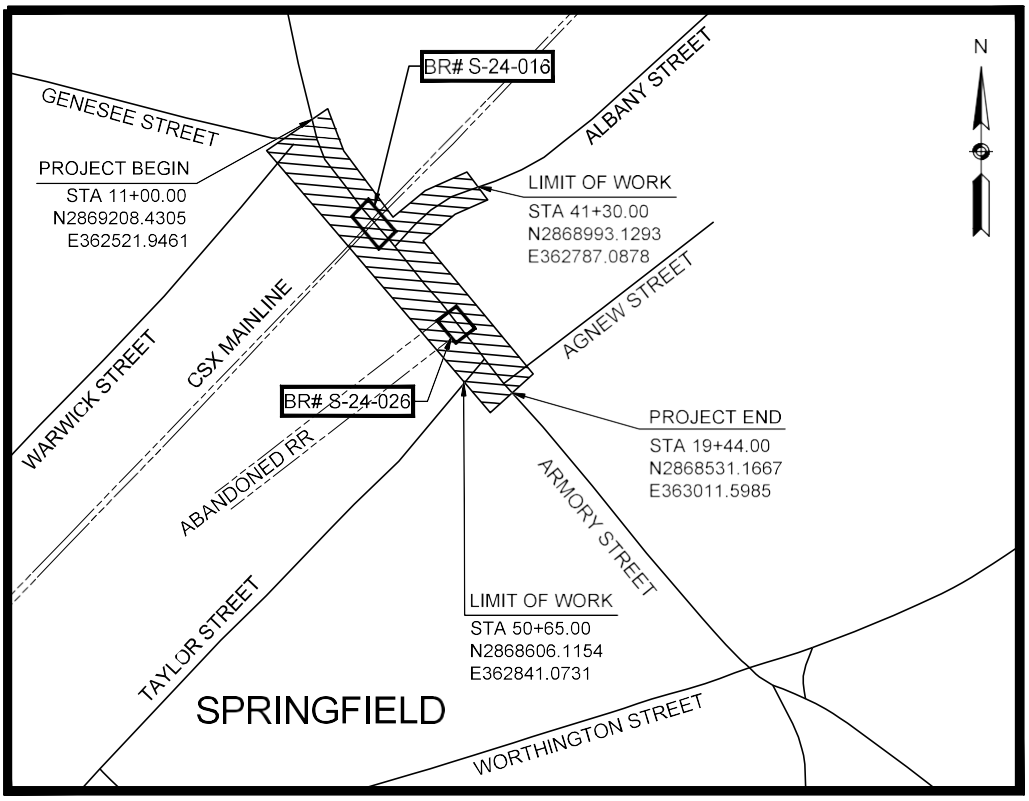
DOCUMENT 00331

LOCUS MAP

SPRINGFIELD
Federal Aid Project No. HIP(NGB)-003S(924)
Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX



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DOCUMENT 00439

Final Report ☐

Interim Report ☐

CONTRACTOR PROJECT EVALUATION FORM

For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010

Date: _____

City/Town: _____ Contractor:_____

Project: _____ Address:_____

F.A. No. _____ Contract Number: _____

Bid Price: _____ Notice to Proceed: _____

Funds: State: _____ Fed Aid:_____ Current Contract Completion Date:_____

Date Work Started: _____ Date Work Completed*: _____

Contractor's Superintendent: _____

Division: (indicates class of work) Highway:_____Bridge:_____Maintenance: _____

*If work was NOT completed within specified time (including extensions) give reasons on following page.

	Excellent 10	Very Good 9	Average 8	7	Fair 6	5	Poor 4	% Rating
1. Workmanship								x 2=
2. Safety								x 2=
3. Schedule								x 1.5=
4. Home Office Support								x 1=
5. Subcontractors Performance								x 1=
6. Field Supervision/ Superintendent								x 1=
7. Contract Compliance								x 0.5=
8. Equipment								x 0.5=
9. Payment of Accounts								x 0.5=
(use back for additional comments)						**Overall Rating:**		

(Give explanation of items 1 through 9 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)

_____ _____

District Construction Engineer's Signature/Date Resident Engineer's Signature/Date

_____

Contractor's Signature Acknowledging Report/Date

Contractor Requests Meeting with the District: No ☐ Yes ☐ Date Meeting Held:_____

Contractor's Comments/Meeting Notes (extra sheets may be added to this form and noted here if needed):

_____

_____

CONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number:_____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.
A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR
(*Write Yes or No in space provided*)

I recommend a deduction for Contractor's unsatisfactory performance: _____

I recommend a deduction for project completed late:_____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 9:_____

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WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

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Revised: 04/28/17

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DOCUMENT 00440

Final Report ☐

Interim Report ☐

SUBCONTRACTOR PROJECT EVALUATION FORM

For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010

Date: _____

City/Town: _____ Subcontractor: _____

Project: _____ Address:_____

F.A. No.:_____ Contract Number: _____

Prime Contractor _____ Current Contract Completion Date:_____

Date Work Started:_____ Date Work Completed*: _____

Subcontractor's Superintendent:_____

Type of Work Performed by Subcontractor: _____

*If work was NOT completed within specified time (including extensions) give reasons on following page.

	Excellent 10	Very Good 9	Average 8	7	Fair 6	5	Poor 4	% Rating
1. Workmanship								x 2=
2. Safety								x 2=
3. Schedule								x 1.5=
4. Home Office Support								x 1.5=
5. Field Supervision/ Superintendent								x 1=
6. Contract Compliance								x 1=
7. Equipment								x 0.5=
8. Payment of Accounts								x 0.5=
(use back for additional comments)							**Overall Rating:**	

(Give explanation of items 1 through 8 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)

_____ _____

District Construction Engineer's Signature/Date Resident Engineer's Signature/Date

_____ _____

Contractor Signature Acknowledging Report/Date Subcontractor Signature Acknowledging Report/Date

Subcontractor Requests Meeting with the District: No ☐ Yes ☐ Date Meeting Held:_____

Subcontractor's Comments / Meeting Notes (extra sheets may be added to this form and noted here if needed):

_____

_____

Contractor's Comments:_____

_____

SUBCONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number:_____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.
A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR
(*Write Yes or No in space provided*)

I recommend a deduction for Contractor's unsatisfactory performance: _____

I recommend a deduction for project completed late:_____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 8: _____

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WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

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Revised: 04/28/17

*** END OF DOCUMENT ***

DOCUMENT 00710
GENERAL CONTRACT PROVISIONS
Revised: 04-16-25

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2025, the SUPPLEMENTAL SPECIFICATIONS, the 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; the 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING and the CONSTRUCTION STANDARD DETAILS are available online at https://www.mass.gov/massdot-highway-division-manuals-and-publications

SPECIAL PROVISIONS FOR RIGHT-TO-KNOW ACT REQUIREMENTS

The Contractor's attention is directed to Massachusetts General Laws, Chapter 111F, commonly known as the Right-To-Know Act, and to the regulations promulgated pursuant thereto. Among the provisions of the Right-To-Know Act is a requirement that employers make available to employees Materials Safety Data Sheets (MSDS) for any substance on the Massachusetts Substance List (MSL) to which employees are, have been, or may be exposed.

To ensure prompt compliance with these regulations and legislation, the Contractor shall:

1. Deliver to the Department, prior to the start of any work under this contract, copies of MSDS for all MSL substances to be used, stored, processed or manufactured at the worksite by the Contractor.

2. Train employees of the Department, who may be exposed to MSL substances as a result of the Contractor's work under this contract, with regard to those specific substances in accordance with requirements of the Right-To-Know Act.

3. Observe all safety precautions recommended on the MSDS for any MSL substance to be used, stored, processed, or manufactured at the worksite by the Contractor.

4. Inform the Department in writing regarding specific protective equipment recommended in the MSDS for MSL substances to which employees of the Department may be exposed as a result of the Contractor's work under this contract.

The Department shall not be liable for any delay or suspension of work caused by the refusal of its employees to perform any work due to the Contractor's failure to comply with the Right-To-Know Act. The Contractor agrees to hold the Department or the Commissioner of the Department harmless and fully indemnified for any and all claims, demands, fines, actions, complaints, and causes of action resulting from or arising out of the Contractor's failure to comply with the requirements of the Right-To-Know Act.

ALTERNATIVE DISPUTE RESOLUTION
Forum, Choice of Law and Mediations:

Any actions arising out of a contract shall be governed by the laws of Massachusetts and shall be brought and maintained in a State or federal court in Massachusetts which shall have exclusive jurisdiction thereof. MassDOT and the Contractor may both agree to mediation of any claim and will share the costs of such mediation pro rata based on the number of parties involved.

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DOCUMENT 00715

SUPPLEMENTAL SPECIFICATIONS

SEPTEMBER 30, 2025

The 2025 *Standard Specifications for Highways and Bridges* are amended by the following modifications, additions and deletions. These Supplemental Specifications prevail over those published in the Standard Specifications.

The Specifications Committee has issued these Supplemental Specifications for inclusion into each proposal until such time as they are updated or incorporated into the next Standard Specifications.

Contractors are cautioned that these Supplemental Specifications are dated and will change as they are updated.

DIVISION I

GENERAL REQUIREMENTS AND COVENANTS

SECTION 2.00: PROPOSAL REQUIREMENTS AND CONDITIONS

Subsection 2.09: Rejection of Proposals
Replace the first bullet in the third paragraph with the following:

- award of the contract would result in the Bidder exceeding the Aggregate Bonding Capacity or the Single Bonding Capacity established by its Surety Company, or the Bidder's Proposal exceeds its Single Contract Limit, or the Bidder was not prequalified in the specified class of work on or before the time of bid opening; or

SECTION 3.00: AWARD AND EXECUTION OF THE CONTRACT

Subsection 3.02: Award of Contract
Replace the third paragraph with the following:

The successful bidder will be notified by mail or otherwise that their bid has been accepted and that they have been awarded the Contract.

SECTION 7.00: LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Subsection 7.01: Laws to be Observed
In paragraph 701.G Buy America Provisions change Federally-aid to Federal-aid.

Subsection 7.05: Insurance Requirements
Change the title of paragraph A to Workers' Compensation Insurance

Subsection 7.22: Labor, Lodging, Board, Maximum Hours of Employment, Weekly Payment, Keeping of Payroll Records.
Replace this subsection with the following;

Subsection 7.22: Labor, Lodging, Board; Maximum Hours of Employment; Minimum Wage Rates; Payment of Wages; Keeping of Payroll Records

Every employee in public work shall lodge, board and trade where and with whom he elects; and no person or their agents or employees under contract with the commonwealth, a county, city or town, or with a department, board, commission or officer acting therefor, for the doing of public work shall directly or indirectly require, as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the contract for such employment. (M.G.L. c. 149, § 25).

Every contract, except for the purchase of material or supplies, involving the employment of laborers, workers, mechanics, foremen or inspectors, to which the commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, worker, mechanic, foreman or inspector working within the commonwealth, in the employ of the contractor, sub-contractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency, or, in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one day, except as aforesaid; provided, that in contracts entered into by the department of highways [a predecessor agency to MassDOT] for the construction or reconstruction of highways there may be inserted in said stipulation a provision that said department, or any contractor or sub-contractor for said department, may employ laborers, workers, mechanics, foreman and inspectors for more than eight hours in any one day in such construction or reconstruction when, in the opinion of the commissioner [currently defined in M.G.L. c. 149, § 1 as the director of the Department of Labor Standards], public necessity so requires. Every such contract not containing the aforesaid stipulation shall be null and void. (M.G.L. c. 149, § 34).

Attention of Bidders is called to M.G.L. c. 149, § 26-27H (the Prevailing Wage Law), requiring that the rate per hour of the wages paid to mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works shall not be less than the rate or rates of wages to be determined by the director of the department of labor standards, and M.G.L. c. 149, § 148 requiring the weekly or bi-weekly payment of employees.

The Contractor shall furnish certified copies of any or all payrolls for the Contract, showing the name, address, and occupational classification of each employee on said works, and the hours worked by, and the wages paid to each such employee. Such payroll shall also include the rates paid for rented trucks or rental equipment of any kind used on the work. This requirement shall also apply to the work of any Subcontractor, having a Subcontract for any of the work performed on the project. Such records shall be kept in such manner as the Director of Labor Standards shall prescribe, and shall be open to inspection by the Engineer or any authorized representative of the Department of Labor Standards at any reasonable time and as often as may be necessary.

SECTION 8.00: PROSECUTION AND PROGRESS

Subsection 8.01: Subletting or Assignment of Contract

In the first bullet of the third paragraph replace the title of Subsection 7.22 Labor, Lodging, Board; Maximum Hours of Employment; Minimum Wage Rates; Payment of Wages; Keeping of Payroll Records

SECTION 9.00: MEASUREMENT AND PAYMENT

Subsection 9.03: Payment for Extra Work

Replace 903.B, first paragraph, numbers (2) and (3) with the following.

(2) Plus 13 percent of direct labor, for the estimated costs of Federal Insurance Contribution Act (FICA) including Medicare; Federal Unemployment Tax Act (FUTA); State Unemployment Tax Act (SUTA), which includes Unemployment Insurance, the Workforce Training Fund Program,-Employer Medical Assistance Contribution, and COVID-19 Recovery Assessment; Earned Sick Time (EST) Law (940 CMR 33.00); and Paid Family and Medical Leave (PFML) Act (458 CMR 2.00); or, as an alternative to the above 13 percent, the Contractor may elect to use actual rates for FICA, FUTA, SUTA, EST and PFML provided the actual rates are supported with verifiable documentation and shall be subject to review by MassDOT Audit Operations.

(3) Plus the estimated cost of Workers' Compensation and Liability Insurance, Health, Welfare and Pension benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;

In 903.B, second paragraph, number (3), replace the word "Workmen's" with "Workers'" .

DIVISION II

CONSTRUCTION DETAILS

SECTION 300: WATER SYSTEMS

SUBSECTION 301: WATER SYSTEMS

Subsection 301.60G: Laying Pipe
Revise the third paragraph to read as follows:

Pipe sections shall be laid with the bell on the upgrade end. Before laying the pipe, the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry.

Subsection 301.80: Method of Measurement
Delete the words cast iron in the first paragraph.

Replace the second paragraph with the following;

Fittings, consisting of bends, tees, caps, wyes, sleeves, reducers, increasers, blow-off fittings and other special fittings, apply only when new materials are necessary and which are not specifically provided for under other items in the Proposal. Fittings other than new will not be paid separately but only under the applicable pipe items. When new fittings are measured separately for payment, the length of pipe occupied by the fittings will not be measured for payment.

SECTION 700: INCIDENTAL WORK

SUBSECTION 715: RURAL MAIL BOXES REMOVED AND RESET

Subsection 715: Rural Mail Boxes Removed and Reset
Change the words mail box and mail boxes to the word mailbox or mailboxes where encountered in the title, and all subsections.

SECTION 800: TRAFFIC CONTROL DEVICES

SUBSECTION 850: TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS

Subsection 850.29: Temporary Barrier and Temporary Barrier Removed and Reset
Delete this subsection.

Subsection 850.49: Temporary Barrier
Delete this subsection.

Subsection 850.69: Temporary Barrier and Temporary Barrier Removed and Reset
Delete this subsection.

Subsection 850.80: Method of Measurement
Delete the fifth paragraph from the end of this subsection.

Subsection 850.81: Basis of Payment
Delete the sixth and seventh paragraphs from the end of this subsection.

SUBSECTION 853: TEMPORARY BARRIER

Subsection 853.: Temporary Barrier
Add this new subsection:

DESCRIPTION

853.20: General

Work under this Subsection consists of furnishing, placing, adjusting, resetting, maintaining, and removing temporary barrier.

MATERIALS

853.40: General

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Material	Section
Precast, Prestressed, and Prefabricated Concrete Products	M4.09.0
Temporary Barrier	M10.16.0
Limited Deflection Temporary Barrier	M10.16.1
Delineators for Temporary Barrier	M10.16.2

The Contractor shall supply a temporary barrier system that meets or exceeds the Test Level (TL) designated in the description of the bid item.

If the Contractor uses a proprietary temporary barrier system, it shall be listed on the QTCE.

Temporary barrier segments that appear to be damaged or in otherwise unsuitable condition may be rejected or ordered to be replaced by the Engineer at no additional cost.

853.41: Deflection

The deflection of a temporary barrier system is defined as the measured deflection, permanent and/or dynamic, during MASH Test Designation 2-11 (for TL-2) or Test Designation 3-11 (for TL-3).

The Contractor shall supply a temporary barrier system that is equal to or less than the maximum allowable deflection (permanent and/or dynamic) for each run of temporary barrier, as shown in the Plans or stated in the Special Provisions. If no distinction between permanent and temporary deflection is shown in the plans or Special Provisions, then dynamic deflection shall govern.

853.42: Precast Concrete Barriers

Precast Concrete Barriers used as temporary barriers shall be fabricated in accordance with M4.09.0: Precast, Prestressed, and Prefabricated Concrete Products. The Contractor shall submit a Certificate of Compliance (CoC) attesting to meeting this requirement.

853.43: Delineation

Delineators installed at 20-ft intervals throughout the entire barrier run shall be included. The delineators shall conform to M10.16.2: Delineators for Temporary Barrier. Delineators that may act as a washer on a bolted connection shall not be used unless specifically allowed by the barrier manufacturer. Delineators that are damaged, are no longer reflective, or go missing while temporary barrier is deployed shall be replaced in kind by the Contractor.

Delineators may be top or side-mounted to the barrier and oriented in a manner to maximize reflectivity to approaching traffic.

Temporary barrier placed on the right side of the travel way, or top-mounted and separating two or more lanes traveling in the same direction, shall use white delineators. Temporary barrier placed on the left side of the travel way shall use amber or yellow delineators; if separating two-way traffic and top-mounted, the delineator shall be double-sided.

853.44: Anchored Barrier

Temporary barrier systems that include an anchor system in order to meet performance requirements of the contract and/or meet MASH testing requirements may be accepted for use at the discretion of the Department.

Barrier that utilizes an anchor system shall use the same pattern, placement, and material of anchors that was used in MASH crash testing.

853.45: Shop Drawings

Within 30 days of the Notice to Proceed, the Contractor shall provide Shop Drawings showing the proposed temporary barrier system and confirming that it conforms to 853.40: General and will meet the allowable deflection requirements as described in 853.41: Deflection.

If anchors are proposed, the means, methods, pattern, placement, and materials for anchoring and subsequent pavement and/or deck repairs following removal of the temporary barrier system shall be included in the Shop Drawing submittal. If the use of an anchor system is rejected by the Department, the Contractor shall select an unanchored system that meets or exceeds the contract specified performance requirements, at no additional cost.

Shop Drawings for proprietary barrier systems shall include manufacturer's instructions for installation.

CONSTRUCTION METHODS

853.60: General

A Traffic Management Plan approved by the Department is required prior to the installation of the temporary barrier system.

The Contractor shall install temporary barrier systems in accordance with the Plans.

Barrier ends shall not be exposed to approaching traffic during installation. Crashworthy shielding or attenuation shall be provided at all times.

Proprietary temporary barrier systems shall be installed per the manufacturer's instructions.

The Contractor shall not place any breaks in the temporary barrier system that will result in sections that are shorter than the tested minimum length-of-need (LON) under MASH Test 2-11 (for TL-2) or 3-11 (for TL-3). Exceptions shall be allowed for gate systems or changeable length segments placed over expansion joints, if those barrier segment types have been determined to be crashworthy per MASH.

Temporary barrier shall not be placed on unpaved surfaces, unless otherwise shown in the Plans.

The Contractor shall not store materials, vehicles, or other equipment within the measured dynamic deflection envelope, as defined in 853.41: Deflection.

853.61: Temporary Barrier Removed and Reset

Temporary Barrier Removed and Reset consists of relocating a string of temporary barrier from one alignment to another to support the sequence and phasing of construction, as shown in the Plans.

Temporary Barrier Removed and Reset does not include moving all or a portion of the temporary barrier system to gain access to a work area, for the convenience of the Contractor, or to realign units that have moved due to construction activities or a traffic incident.

853.62: Quality Control Inspection

After temporary barrier installation is completed, the Contractor shall perform a Quality Control (QC) Inspection in the presence of the Engineer. QC Inspection activities shall include, but are not limited to the following reviews:

- Installation location per the approved Plans.
- Alignment and connection mechanism between adjacent barrier segments.
- Alignment and connection mechanism between barrier segment and attenuator, if present.
- Anchor system installation, if present.

For proprietary barrier systems, the QC Inspection shall also include any manufacturer-specific inspection details or criteria found in the installation instructions.

Work behind the barrier shall not commence until the QC Inspection has been accepted by the Engineer.

COMPENSATION

853.80: Method of Measurement

Temporary Barrier will be measured by the foot installed, in place.

Temporary Barrier Removed and Reset will be measured by the foot removed and reset.

853.81: Basis of Payment

Temporary Barrier will be paid for at the contract unit price per foot which shall provide full compensation for fabrication, storage, transport, furnishment, installation, delineation, alignment, maintenance, repair, and final removal of the temporary barrier.

Temporary Barrier Removed and Reset will be paid for at the contract unit price per foot which shall provide full compensation for removing, relocating, transporting, and installing new anchorage (if used). If more than one accepted temporary barrier system is approved for use in a single contract, the unit cost for Temporary Barrier Removed and Reset shall not differ among systems.

All costs associated with fabrication, installation, and maintenance of temporary barrier delineators shall be considered incidental to the cost of the item.

All costs associated with Shop Drawings and COCs shall be considered incidental to the item.

All costs associated with patching or repairing the road surface or bridge deck due to the installation and removal of temporary barrier and/or anchors for a temporary barrier system shall be considered incidental to the cost of the item.

853.82: Payment Items

Item number	Description	Unit
853.2	Temporary Barrier (TL-2)	Foot
853.21	Temporary Barrier Removed and Reset	Foot
853.23	Temporary Barrier (TL-3)	Foot
853.33	Temporary Barrier – Limited Deflection (TL-3)	Foot

SECTION 900: STRUCTURES

SUBSECTION 902: ULTRA HIGH PERFORMANCE CONCRETE

Subsection 902.32: Mockup

In Table 902.32-1 change the Link Slab width to 2 ft – 0 in. and change the Joint Header width to 0 ft – 6 in. .

Subsection 902.32: - 902.38

Renumber section 902.32 Surface Preparation to 902.33 Surface Preparation and renumber section 902.33 through 902.38 to 902.34 through 902.39.

DIVISION III

MATERIALS SPECIFICATIONS

SECTION M2: AGGREGATES AND RELATED MATERIALS

Subsection M2.01.0 Crushed Stone
Replace the fourth paragraph and the associated asterisk notes with the following;

The crushed stone shall have a maximum 45% wear as determined by the Los Angeles Abrasion Test (AASHTO T 96)

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUIT

Subsection M5.01.0 Joint Materials for Pipe
Replace this subsection with the following;

- Jute or oakum furnished for use in pipe joints shall be of an accepted grade approved for common usage.
- Mortar shall conform to the requirements of M4.04.0: Cementitious Grout, Mortar and Concrete Products
- Standard couplers as approved by the manufacturer shall be used to join corrugated metal pipe
- Rubber ring or plastic gaskets for concrete pipe joints, or manholes section joints shall be of tough, flexible, chemical-resistant material, and of such size and shape as to ensure satisfactory pipe joints when incorporated in the work and shall conform to AWWA C153.
- Rubber gasket joints for ductile iron pipe shall be Styrene-Butadiene Rubber (SBR), Ethylene Propylene Diene Monomer (EPDM) or Nitrile and conform to AWWA C111

Subsection M5.05.03.B Gate Valves
Replace this subsection with the following;

Gate valves shall conform to the requirements of AWWA Standard C500 and/or to the type used by the municipality as specified in the Special Provisions.

SECTION M7: PAINTS, PROTECTIVE COATINGS AND PAVEMENT MARKINGS

Subsection M7.01.04 Fast Drying White and Yellow Waterborne Traffic Paint
Replace the subsection with the following;

Approved waterborne traffic paint shall be tested in accordance with AASHTO M 348 and be listed on the QCML The dry paint film shall be under the Toxicity Characteristic Leaching Procedure (TCLP) limits for all contaminants listed in 40 CFR 261.24. The markings shall be installed using reflective glass beads meeting the requirements of M7.01.07. For waterborne yellow paint use Organic Yellow No. 65 or No. 75 pigment.

SECTION M9: MISCELLANEOUS MATERIALS

Subsection M9.12.0 Reflectors for Barriers
Delete this subsection.

SECTION M10: TRAFFIC CONTROL DEVICES

Subsection M10.16.0: Temporary Barrier
Subsection M10.16.1: Limited Deflection Temporary Barrier
Subsection M10.16.2: Delineators for Temporary Barrier
Add these new subsections.

M10.16.0: Temporary Barrier

All Temporary Barrier shall be tested to MASH crash testing standards and the results of the following crash test designations must fall within the acceptable impact tolerances and evaluation criteria shown in Table 2-2A of MASH:

- Test Level 2: 2-10, 2-11
- Test Level 3: 3-10, 3-11

M10.16.1: Limited Deflection Temporary Barrier

To be classified as a Limited Deflection Temporary Barrier, the results of MASH Test Designation 3-11 must result in a measured dynamic deflection of 24 in. or less.

M10.16.2: Delineators for Temporary Barrier

Delineators for Temporary Barrier shall consist of a housing, retroreflective material, and an adhesive or mechanical fastener.

Housings for Delineators for Temporary Barrier shall be fabricated from a lightweight polymer material. Metal housings shall not be permitted.

Retroreflection shall be achieved using an acrylic reflector or retroreflective sheeting directly applied to the housing. If used, retroreflective sheeting shall be factory applied and conform to ASTM D4956 Type IV, Type V, or Type IX. A minimum of 8 $in.^2$ of reflective material shall be visible on any traffic-facing portion of the delineator.

Delineators shall be attached to temporary barriers using a manufacturer-approved adhesive or mechanical fastener.

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END OF SUPPLEMENTAL SPECIFICATIONS

DOCUMENT 00760

FHWA-1273 – Revised October 23, 2023

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Non-segregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
XI. Certification Regarding Use of Contract Funds for Lobbying
XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than $10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH–1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to DBAconformance@dol.gov. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the “Statement of Compliance” required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* $31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B) This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

DOCUMENT 00811

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
Revised: 02/03/2023

This provision applies to all projects using greater than 100 tons of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

Price Adjustments will be based on the variance in price, for the liquid asphalt component only, between the Base Price and the Period Price. They shall not include transportation or other charges. Price Adjustments will occur on a monthly basis.

Base Price
The Base Price of liquid asphalt on a project as listed in the Notice to Contractors section of the bid documents is a fixed price determined by the Department at the time of the bid using the same method as the determination of the Period Price detailed below. The Base Price shall be used in all bids.

Period Price
The Period Price is the price of liquid asphalt for each monthly period as determined by the Department using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. The Department will post this Period Price on its website at https://www.mass.gov/service-details/massdot-current-contract-price-adjustments following its receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted the Department the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

Price Adjustment Determination, Calculation and Payment
The Contract Price of the HMA mixture will be paid under the respective item in the Contract. Price Adjustments, as herein provided, either upwards or downwards, will be made after the work has been performed using the monthly period price for the month during which the work was performed.

Price Adjustments will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the approved Job Mix Formula.

Price Adjustments will be separate payment items. The pay item numbers are 999.401 for a positive price adjustment (a payment) and 999.402 for a negative price adjustment (a deduction). Price Adjustments will be calculated using the following equation:

Price Adjustment = Tons of HMA Placed X Liquid Asphalt Content % X RAP Factor X (Period Price - Base Price)

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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DOCUMENT 00812

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE –
ENGLISH UNITS
Revised: 02/01/2021

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site https://www.mass.gov/service-details/massdot-current-contract-price-adjustments for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply only to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS	
	Diesel	**Gasoline**
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144, 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY.	0.15 Gallons / CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply

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DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

February 4, 2026

This special provision applies to all projects containing the use of structural steel and/or reinforcing steel as specified elsewhere in the Contract work. It applies to all structural steel and all reinforcing steel, as defined below, on the project. Compliance with this provision is mandatory, i.e., there are no "opt-in" or "opt-out" clauses. Price adjustments will be handled as described below and shall only apply to unfabricated reinforcing steel bars and unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings.

Price adjustments will be variances between Base Prices and Period Prices. Base Prices and Period Prices are defined below.

Price adjustments will only be made if the variances between Base Prices and Period Prices are 5% or more. A variance can result in the Period Price being either higher or lower than the Base Price. Once the 5% threshold has been achieved, the adjustment will apply to the full variance between the Base Price and the Period Price.

Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars on a project by the index factor calculated as shown below under Example of a Period Price Calculation.

Price adjustments will ***not*** include guardrail panels or the costs of shop drawing preparation, handling, fabrication, coatings, transportation, storage, installation, profit, overhead, fuel costs, fuel surcharges, or other such charges not related to the cost of the unfabricated structural steel and unfabricated reinforcing steel.

The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

Base Prices and Period Prices are defined as follows:

Base Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are fixed prices determined by the Department and found in the table below. While it is the intention of the Department to make this table comprehensive, some of a project's unfabricated structural steel and/or unfabricated reinforcing steel may be inadvertently omitted. Should this occur, the Contractor shall bring the omission to the Department's attention so that a contract alteration may be processed that adds the missing steel to the table and its price adjustments to the Contract.

The Base Price Date is the month and year of the most recent finalized period price index at the time that MassDOT opened bids for the project. The Base Price Index for this contract is the Steel PPI listed in the Notice to Contractors.

Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices that have been calculated using the Period Price Date and an index of steel prices to adjust the Base Price.

The Period Price Date is the date the steel was delivered to the fabricator as evidenced by an official bill of lading submitted to the Department containing a description of the shipped materials, weights of the shipped materials and the date of shipment. This date is used to select the Period Price Index.

The index used for the calculation of Period Prices is the U.S. Department of Labor Bureau of Labor Statistics Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four (4) months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a "(P)".

Period Prices are determined as follows:

Period Price = Base Price X Index Factor
Index Factor = Period Price Index / Base Price Index

Example of a Period Price Calculation:

Calculate the Period Price for December 2009 using a Base Price from March 2009 of $0.82/Pound for 1,000 Pounds of ASTM A709 (AASHTO M270) Grade A36 Structural Steel Plate.

The Period Price Date is December 2009. From the PPI website*, the Period Price Index = 218.0.

The Base Price Date is March 2009. From the PPI website*, the Base Price Index = 229.4.

Index Factor = Period Price Index / Base Price Index = 218.0 / 229.4 = 0.950
Period Price = Base Price X Index Factor = $0.82/Pound X 0.950 = $0.78/Pound

Since $0.82 - $0.78 = $0.04 is less than 5% of $0.82, no price adjustment is required.

If the $0.04 difference shown above was greater than 5% of the Base Price, then the price adjustment would be 1,000 Pounds X $0.04/Pound = $40.00. Since the Period Price of $0.78/Pound is less than the Base Price of $0.82/Pound, indicating a drop in the price of steel between the bid and the delivery of material, a credit of $40.00 would be owed to MassDOT. When the Period Price is higher than the Base Price, the price adjustment is owed to the Contractor.

* To access the PPI website and obtain a Base Price Index or a Period Price Index, go to http://data.bls.gov/cgi-bin/srgate

End of example.

The Contractor will be paid for unfabricated structural steel and unfabricated reinforcing steel under the respective contract pay items for all components constructed of either structural steel or reinforced Portland cement concrete under their respective Contract Pay Items.

Price adjustments, as herein provided for, will be paid separately as follows:

Structural Steel
Pay Item Number 999.449 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.457 for negative (-) pay adjustments (credits to MassDOT Highway Division)

Reinforcing Steel
Pay Item Number 999.466 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.467 for negative (-) pay adjustments (credits to MassDOT Highway Division)

No price adjustment will be made for price changes after the Contract Completion Date, unless the MassDOT Highway Division has approved an extension of Contract Time for the Contract.

TABLE

Steel Type		Price per Pound
1	ASTM A615/A615M Grade 60 (AASHTO M31 Grade 60 or 420) Reinforcing Steel	$0.57
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note below.)	$0.80
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	$0.80
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	$0.83
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	$0.87
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	$0.82
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	$0.87
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	$0.82
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	$0.90
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	$0.83
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	$0.90
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	$0.83
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	$0.94
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	$1.01
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	$1.55
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	$0.90
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	$0.83
18	ASTM A276 Type 316 Stainless Steel	$4.65
19	ASTM A240 Type 316 Stainless Steel	$4.65
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	$1.60
21	ASTM A53 Grade B Structural Steel Pipe	$1.01
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	$1.01
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	$0.80
24	ASTM 252, Grade 2 Permanent Steel Casing	$0.80
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	$0.85
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	$1.53
27	ASTM A572 / A572M, Grade 50 Sheetpiling	$1.53
28	ASTM A36/36M, Grade 50	$0.87
29	ASTM A570, Grade 50	$0.85
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	$0.87
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	$1.01
32	AREA 140 LB Rail and Track Accessories	$0.52

NOTE: Steel Castings are generally used only on moveable bridges. Cast iron frames, grates and pipe are not “steel” castings and will not be considered for price adjustments.

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DOCUMENT 00814

SPECIAL PROVISIONS
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the **Construction Economics** section of *ENR Engineering News-Record* magazine or at the ENR website http://www.enr.com under **Construction Economics**. The Period Price will be posted on the MassDOT website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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DOCUMENT 00820

THE COMMONWEALTH OF MASSACHUSETTS SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM

I. Definitions

For purposes of this contract,

"Minority" means a person who meets one or more of the following definitions:

(a) American Indian or Native American means: all persons having origins in any of the original peoples of North America and who are recognized as an Indian by a tribe or tribal organization.
(b) Asian means: All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian sub-continent, or the Pacific Islands, including, but Not limited to China, Japan, Korea, Samoa, India, and the Philippine Islands.
(c) Black means: All persons having origins in any of the Black racial groups of Africa, including, but not limited to, African-Americans, and all persons having origins in any of the original peoples of the Cape Verdean Islands.
(d) Eskimo or Aleut means: All persons having origins in any of the peoples of Northern Canada, Greenland, Alaska, and Eastern Siberia.
(e) Hispanic means: All persons having their origins in any of the Spanish-speaking peoples of Mexico, Puerto Rico, Cuba, Central or South America, or the Caribbean Islands.

"State construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility, or a contract for the construction, reconstruction, alteration, remodeling or repair of a public work undertaken by a department, agency, board, or commission of the commonwealth.

"State assisted construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility undertaken by a political subdivision of the commonwealth, or two or more political subdivisions thereof, an authority, or other instrumentality and whose costs of the contract are paid for, reimbursed, grant funded, or otherwise supported, in whole or in part, by the commonwealth.

II. Equal Opportunity, Non-Discrimination and Affirmative Action

During the performance of this Contract, the Contractor and all subcontractors (hereinafter collectively referred to as "the Contractor") for a state construction contract or a state assisted construction contract, for him/herself, his/her assignees and successors in interest, agree to comply with all applicable equal employment opportunity, non-discrimination and affirmative action requirements, including but not limited to the following:

In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability, shall not discriminate in the selection or retention of subcontractors, and shall not discriminate in the procurement of materials and rentals of equipment.

The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion, or transfer; recruitment advertising, layoff or termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship or on-the-job training opportunity. The Contractor shall comply with the provisions of chapter 151B of the Massachusetts General Laws, as amended, and all other applicable anti-discrimination and equal opportunity laws, all of which are herein incorporated by reference and made a part of this Contract.

The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the Massachusetts Commission Against Discrimination setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter l51 B).

In connection with the performance of work under this contract, the Contractor shall undertake, in good faith, affirmative action measures to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. Such affirmative action measures shall entail positive and aggressive measures to ensure nondiscrimination and to promote equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, apprenticeship and on-the-job training programs. A list of positive and aggressive measures shall include, but not be limited to, advertising employment opportunities in minority and other community news media; notifying minority, women and other community-based organizations of employment opportunities; validating all job specifications, selection requirements, and tests; maintaining a file of names and addresses of each worker referred to the Contractor and what action was taken concerning such worker; and notifying the administering agency in writing when a union with whom the Contractor has a collective bargaining agreement has failed to refer a minority or woman worker. These and other affirmative action measures shall include all actions required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. One purpose of this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this and future Commonwealth public construction projects.

III. Minority and Women Workforce Participation

Pursuant to his/her obligations under the preceding section, the Contractor shall strive to achieve on this project the labor participation goals contained herein. Said participation goals shall apply in each job category on this project including but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers and those classes of work enumerated in Section 44F of Chapter 149 of the Massachusetts General Laws. The participation goals for this project shall be 15.3% for minorities and 6.9% for women. The participation goals, as set forth herein, shall not be construed as quotas or set-asides; rather, such participation goals will be used to measure the progress of the Commonwealth's equal opportunity, non-discrimination and affirmative action program. Additionally, the participation goals contained herein should not be seen or treated as a floor or as a ceiling for the employment of particular individuals or group of individuals.

IV. Liaison Committee

At the discretion of the agency that administers the contract for the construction project there may be established for the life of the contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the agency or agencies administering the contract for the construction project, hereinafter called the administering agency, a representative from the Office of Affirmative action, and such other representatives as may be designated by the administering agency. The Contractor (or his/her agent, if any, designated by him/her as the on-site equal employment opportunity officer) shall recognize the Liaison Committee as an affirmative action body, and shall establish a continuing working relationship with the Liaison Committee, consulting with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

V. Reports and Records

The Contractor shall prepare projected workforce tables on a quarterly basis when required by the administering agency. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and also, when updated, to the administering agency and the Liaison Committee when required.

The Contractor shall prepare weekly reports in a form approved by the administering agency, unless information required is required to be reported electronically by the administering agency, the number of hours worked in each trade by each employee, identified as woman, minority, or non-minority. Copies of these shall be provided at the end of each such week to the administering agency and the Liaison Committee.

Records of employment referral orders, prepared by the Contractor, shall be made available to the administering agency on request.

The Contractor will provide all information and reports required by the administering agency on instructions issued by the administering agency and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the administering agency to effect the employment of personnel. This provision shall apply only to information pertinent to the Commonwealth's supplementary non-discrimination, equal opportunity and access and opportunity contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the administering agency and shall set forth what efforts he has made to obtain the information.

VI. Access to Work Site

A designee of the administering agency and a designee of the Liaison Committee shall each have a right to access the work site.

VII. Solicitations for Subcontracts, and for the Procurement of Materials and Equipment

In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under this contract relative to non-discrimination and equal opportunity.

VIII. Sanctions

Whenever the administering agency believes the General or Prime Contractor or any subcontractor may not be operating in compliance with the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter 151B), the administering agency may refer the matter to the Massachusetts Commission Against Discrimination ("Commission") for investigation.

Following the referral of a matter by the administering agency to the Massachusetts Commission Against Discrimination, and while the matter is pending before the MCAD, the administering agency may withhold payments from contractors and subcontractors when it has documentation that the contractor or subcontractor has violated the Fair Employment Practices Law with respect to its activities on the Project, or if the administering agency determines that the contractor has materially failed to comply with its obligations and the requirements of this Section. The amount withheld shall not exceed a withhold of payment to the General or Prime Contractor of 1/100 or 1% of the contract award price or $5,000, whichever sum is greater, or, if a subcontractor is in non-compliance, a withhold by the administering agency from the General Contractor, to be assessed by the General Contractor as a charge against the subcontractor, of 1/100 or 1% of the subcontractor price, or $1,000 whichever sum is greater, for each violation of the applicable law or contract requirements. The total withheld from anyone General or Prime Contractor or subcontractor on a Project shall not exceed $20,000 overall. No withhold of payments or investigation by the Commission or its agent shall be initiated without the administering agency providing prior notice to the Contractor.

If, after investigation, the Massachusetts Commission Against Discrimination finds that a General or Prime Contractor or subcontractor, in commission of a state construction contract or state-assisted construction contract, violated the provisions of the Fair Employment Practices Law, the administering agency may convert the amount withheld as set forth above into a permanent sanction, as a permanent deduct from payments to the General or Prime Contractor or subcontractor, which sanction will be in addition to any such sanctions, fines or penalties imposed by the Massachusetts Commission Against Discrimination.

No sanction enumerated under this Section shall be imposed by the administering agency except after notice to the General or Prime Contractor or subcontractor and an adjudicatory proceeding, as that term is used, under Massachusetts General Laws Chapter 30A, has been conducted.

IX. Severability

The provisions of this section are severable, and if any of these provisions shall be held unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

X. Contractor's Certification

After award and prior to the execution of any contract for a state construction contract or a state assisted construction contract, the Prime or General Contractor shall certify that it will comply with all provisions of this Document 00820 Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, by executing Document 00859 Contractor/Subcontractor Certification Form.

XI. Subcontractor Requirements

Prior to the award of any subcontract for a state construction contract or a state assisted construction contract, the Prime or General Contractor shall provide all prospective subcontractors with a complete copy of this Document 00820 entitled "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" and will incorporate the provisions of this Document 00820 into any and all contracts or work orders for all subcontractors providing work on the Project. In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the prime contract, the Prime or General Contractor shall certify in writing to the administering agency that it has complied with the requirements as set forth in the preceeding paragraph by executing Document 00859 Contractor/Subcontractor Certification Form.

Rev'd 03/07/14

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DOCUMENT 00821

ELECTRONIC REPORTING REQUIREMENTS
CIVIL RIGHTS PROGRAMS AND CERTIFIED PAYROLL

Implemented on March 2, 2009 Revised June 04, 2019

The Massachusetts Department Of Transportation (MassDOT) has replaced the CHAMP reporting system with Equitable Business Opportunity Solution (EBO), a new web-based civil rights reporting software system. This system is capable of handling both civil rights reporting requirements and certified payrolls. The program's functions include the administration of Equal Employment Opportunity (EEO) requirements, On-The-Job Training requirements (OJT), Disadvantage Business Enterprise (DBE) and/or Minority / Women's Business Enterprise (M/WBE) subcontracting requirements, and the electronic collection of certified payrolls associated with MassDOT projects. In addition, this system is used to generate various data required as part of the American Recovery and Reinvestment Act (ARRA). Contractors are responsible for all coordination with all sub-contractors to ensure timely and accurate electronic submission of all required data.

Contractor and Sub-Contractor EBO User Certification

All contractors and sub-contractors must use the EBO software system. The software vendor, Internet Government Solutions (IGS), has developed an online EBO Training Module that is available to contractors and sub-contractors. This module is a self-tutorial which allows all users in the company to access the training, complete the tutorial, and become certified as EBO users for a one time fee of $75.00. This is the only cost to contractors and sub-contractors associated with the EBO software system. The online EBO Training Module can be accessed at www.ebotraining.com. Click the "Register My Company" button on the login page to begin your training registration. Questions regarding EBO online training should be directed to Gerry Anguilano, IGS at (440) 238-1684.

MassDOT will track contractors and sub-contractors who have successfully completed the on-line training module. All persons performing civil rights program and/or certified payroll functions should be EBO certified.

Vetting of Firms and Designated Firm Individuals

Contractors must authorize a Primary Log-In ID Holder who has completed EBO on-line training to have access to the EBO system by completing and submitting the "Request For EBO System Log-In/Password Form" located on the MassDOT website at: https://www.mass.gov/how-to/how-to-get-an-ebo-login
Contractors must also agree to comply with the EBO system user agreement located on the MassDOT website.

All subcontracts entered into on a project must include language that identifies the submission and training requirements that the sub-contractor must perform. Sub-contractors will be approved by the respective District Office of MassDOT through the existing approval process. When new sub-contractors, who have not previously worked for MassDOT, are initially selected by a general contractor, the new sub-contractor must be approved by the District before taking the EBO on-line training module.

Interim Reporting Requirements

Until MassDOT is satisfied that the EBO system is fully operational and functioning as designed, contractors and sub-contractors will be required to submit certified payrolls manually. There will be a transition period where dual reporting, through manual and electronic submission, will be required. MassDOT, however, will notify contractors and sub-contractors when they may cease manual submission of certified payrolls.

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DOCUMENT 00859

CONTRACTOR/SUBCONTRACTOR CERTIFICATION FORM ‡

The contractor shall submit this completed document 00859 to MassDOT for each subcontract.

_____ **(Contractor)** **Date:**_____

_____**(Subcontractor)** ☐ District Approved **S**ubcontractor

Contract No: 133236 **Project No.** 609409 **Federal Aid No.:** HIP(NGB)-003S(924)

Location: SPRINGFIELD

Project Description: Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX

PART 1 CONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that to the best of my knowledge, information and belief, the company is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices, that the company will not discriminate in their employment practices, that the company will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained in Contract Document 00820 The Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, and that the company will comply with the special provisions and documentation indicated below (as checked).

I further hereby certify, as an authorized official of this company, that the special provisions and documentation indicated below (as checked) have been or are included in, and made part of, the Subcontractor Agreement entered into with the firm named above.

☐ **This is not a Federally-aided construction project**

Document #

☐ 00718 –Participation By Minority Or Women's Business Enterprises and SDVOBE†
☐ 00761 –Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program
☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs, and Certified Payroll
☐ 00859 – Contractor/Subcontractor Certification Form (this document)
☐ 00860 – MA Employment Laws
☐ 00861 – Applicable State Wage Rates in the Contract Proposal**
☐ B00842 – MA Schedule of Participation By Minority or Women Business Enterprises (M/WBEs)†
☐ B00843 – MA Letter of Intent – M/WBEs†

** Does not apply to Material Suppliers, unless performing work on-site
† Applies only if Subcontractor is a M/WBE; only include these forms for the particular M/WBE Entity

☐ B00844 - Schedule of Participation By SDVOBE
☐ B00845 - Letter of Intent – SDVOBE
☐ B00846 – M/WBE or SDVOBE Joint Check Arrangement Approval Form
☐ B00847 – Joint Venture Affidavit

☐ **This is a Federally-aided construction project (Federal Aid Number is present)**

Document #

☐ 00719 – Special Provisions for Participation by Disadvantaged Business Enterprises†
☐ 00760 - Form FHWA 1273 - Required Contract Provisions for Federal-Aid Construction Contracts
☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program
☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs and Certified Payroll
☐ 00859 – Contractor/Subcontractor Certification Form (this document)
☐ 00860 – MA Employment Laws
☐ 00870 – Standard Federal Equal Employment Opportunity Construction Contract Specifications Executive Order 11246, (41 CFR Parts 60-4.2 and 60-4.3 (Solicitations and Equal Opportunity Clauses)*
☐ 00875 – Federal Trainee Special Provisions

☐ B00853 – Schedule of Participation by Disadvantaged Business Enterprise†
☐ B00854 – Letter of Intent – DBEs†
☐ B00855 – DBE Joint Check Arrangement Approval Form
☐ B00856 – Joint Venture Affidavit
☐ 00861/00880 - Applicable state and federal wage rates from Contract Proposal**

*Applicable only to Contracts or Subcontracts in excess of $10,000
**Does not apply to Material Suppliers, unless performing work on-site
† Applies only if Subcontractor is a DBE; only include these forms for the particular DBE Entity

Signed this _____ Day of _____, 20_____ Under The Pains And Penalties Of Perjury.

_____ _____
(Print Name and Title) (Authorized Signature)

PART 2

PART 2 SUBCONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that the required documents in Part 1 above were physically incorporated in our Agreement/Subcontract with the Contractor and give assurance that this company will fully comply or make every good faith effort to comply with the same. I further certify that:

1. This company recognizes that if this is a Federal-Aid Project, then this Contract is covered by the equal employment opportunity laws administered and enforced by the United States Department of Labor ("USDOL"), Office of Federal Contract Compliance Programs ('OFCCP"). By signing below, we acknowledge that this company has certain reporting obligations to the OFCCP, as specified by 41 CFR Part 60-4.2.
2. This company further acknowledges that any contractor with fifty (50) or more employees on a Federal-aid Contract with a value of fifty-thousand ($50,000) dollars or more must annually file an EEO-1 Report (SF 100) to the EEOC, Joint Reporting Committee, on or before September 30th, each year, as specified by 41 CFR Part 60-1.7a.
3. For more information regarding the federal reporting requirements, please contact the USDOL, OFCCP Regional Office, at 1-646-264-3170 or EEO-1, Joint Reporting Committee at 1-866-286-6440.
4. This company ☐ has, ☐ has not, participated in a previous contract or subcontract subject to the Equal Opportunity clauses set forth in 41 CFR Part 60-4 and Executive Order 11246, and where required, has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs or the EEO Commission all reports due under the applicable filing requirements.
5. This company is in full compliance with applicable Federal and Commonwealth of Massachusetts laws, rules, and regulations and is not currently debarred or disqualified from bidding on or participating in construction contracts in any jurisdiction of the United States. See : https://www.mass.gov/service-details/contractors-and-vendors-suspended-or-debarred-by-massdot
6. This company is properly registered and in good standing with the Office of the Secretary of the Commonwealth.

Signed this _____ Day of _____, 20_____, Under The Pains And Penalties Of Perjury.

Firm: _____
Address: _____
_____
_____
Telephone Number:_____
Federal I.D. Number:_____
Estimated Start Date:_____
Estimated Completion Date:_____
Estimated Dollar Amount:_____

_____
(Print Name and Title)

_____
(Authorized Signature)

_____
(Date)

Rev'd 09/02/22

*** END OF DOCUMENT ***

DOCUMENT 00860

COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS

Revised February 20, 2019

The Contractor's attention is directed to Massachusetts General Laws, Chapter 149, Sections 26 through 27H, and 150A. This contract is considered to fall within the ambit of that law, which provides that in general, the Prevailing Rate or Total Rate must be paid to employees working on projects funded by the Commonwealth of Massachusetts or any political subdivision including Massachusetts Department of Transportation (MassDOT).

A Federal Aid project is also subject to the Federal Minimum Wage Rate law for construction. When comparing a state minimum wage rate, monitored by the Massachusetts Attorney General, versus federal minimum wage rate, monitored by the U.S. Department of Labor Wage and Hour Division, for a particular job classification the higher wage is at all times to be paid to the affected employee.

Every contractor or subcontractor engaged in this contract to which sections twenty-seven and twenty-seven A apply will keep a true and accurate record of all mechanics and apprentices, teamsters, chauffeurs and laborers employed thereon, showing the name, address and occupational classification of each such employee on this contract, and the hours worked by, and the wages paid to, each such employee, and shall furnish to the MassDOT's Resident Engineer, on a weekly basis, a copy of said record, in a form approved by MassDOT and in accordance with M.G.L. c. 149, § 27B, signed by the employer or his/her authorized agent under the penalties of perjury.

Each such contractor or subcontractor shall preserve its payroll records for a period of three years from the date of completion of the contract.

The Prevailing Wage Rate generally includes the following:

> Minimum Hourly Wage + Employer Contributions to Benefit Plans = Prevailing Wage Rate or Total Rate
>
> Any employer who does not make contributions to Benefit Plans must pay the total Prevailing Wage Rate directly to the employee.

Any deduction from the Prevailing Wage Rate or Total Rate for contributions to benefit plans can only be for a Health & Welfare, Pension, or Supplementary Unemployment plan meeting the requirements of the Employee Retirement Income Security Act (ERISA) of 1974. The maximum allowable deduction for these benefits from the prevailing wage rate cannot be greater than the amount allowed by Executive Office of Labor (EOL) for the specified benefits. Any additional expense of providing benefits to the employees is to be borne by the employer and cannot be deducted from the Minimum Hourly Wage. If the employer's benefit expense is less than that so provided by EOL the difference will be paid directly to the employee. The rate established must be paid to all employees who perform work on the project.

When an employer makes deductions from the Minimum Hourly Wage for an employee's contribution to social security, state taxes, federal taxes, and/or other contribution programs, allowed by law, the employer shall furnish each employee a suitable pay slip, check stub or envelope notifying the employee of the amount of the deductions.

No contractor or subcontractor contracting for any part of the contract week shall require or permit any laborer or mechanic to be employed on such work in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of forty hours in such workweek, whichever is the greater number of overtime hours.

Apprentice Rates are permitted only when there is an Apprentice Agreement registered with the Massachusetts Division of Apprentice Training in accordance with M.G.L. c. 23, § 11E-11L.

The Prevailing Wage Rates issued for each project shall be the rates paid for the entire project. The Prevailing Wage Rates must be posted on the job site at all times and be visible from a public way.

In addition, each such contractor and subcontractor shall furnish to the MassDOT's Resident Engineer, within fifteen days after completion of its portion of the work, a statement, executed by the contractor or subcontractor or by any authorized officer or employee of the contractor or subcontractor who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

Date: _____

I , _____do hereby state:
(Name of signatory party) (Title)

That I pay or supervise the payment of the persons employed by:

_____
(Contractor or Subcontractor)

on the _____
(MassDOT Project Location and Contract Number)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty-nine of the General Laws.

Signature _____

Title _____

The above-mentioned copies of payroll records and statements of compliance shall be available for inspection by any interested party filing a written request to the MassDOT's Resident Engineer for such inspection and copying.

Massachusetts General Laws c. 149, §27, requires annual updates to prevailing wage schedules for all public construction contracts lasting longer than one year. MassDOT will request the required updates and furnish them to the Contractor. The Contractor is required to pay no less than the wage rates indicated on the annual updated wage schedules.

MassDOT will request the updates no later that two week before the anniversary of the Notice to Proceed date of the contract to allow for adequate processing by the Department of Labor Standards (DLS). The effective date for the new rates will be the anniversary date of the contract (i.e. the notice to proceed date), regardless of the date of issuance on the schedule from DLS.

All bidders are cautioned that the aforementioned laws require that employers pay to covered employees no less than the applicable minimum wages. In addition, the same laws require that the applicable prevailing wages become incorporated as part of this contract. The prevailing minimum wage law establishes serious civil and criminal penalties for violations, including imprisonment and exclusion from future public contracts. Bidders are cautioned to carefully read the relevant sections of the Massachusetts General Laws.

*** END OF DOCUMENT ***

DOCUMENT 00861

STATE PREVAILING WAGE RATES

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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS
Prevailing Wage Rates

MAURA HEALY
Governor
KIM DRISCOLL
Lt. Governor

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority:	Massachusetts Highway	**City/Town:**	SPRINGFIELD
Contract Number:	133236		
Description of Work:	SPRINGFIELD – FAP No. HIP(NGB)-003S(924) Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX		
Job Location:	Armory St over CSX Mainline and over Abandoned CSX		

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F “rental of equipment” contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/1/2025	$40.95	$15.57	$21.78	$0.00	$0.00	$78.30
	1/1/2026	$40.95	$16.17	$21.78	$0.00	$0.00	$78.90
	6/1/2026	$41.95	$16.17	$21.78	$0.00	$0.00	$79.90
	12/1/2026	$41.95	$16.17	$23.52	$0.00	$0.00	$81.64
	1/1/2027	$41.95	$16.77	$23.52	$0.00	$0.00	$82.24
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/1/2025	$41.02	$15.57	$21.78	$0.00	$0.00	$78.37
	1/1/2026	$41.02	$16.17	$21.78	$0.00	$0.00	$78.97
	6/1/2026	$42.02	$16.17	$21.78	$0.00	$0.00	$79.97
	12/1/2026	$42.02	$16.17	$23.52	$0.00	$0.00	$81.71
	1/1/2027	$42.02	$16.77	$23.52	$0.00	$0.00	$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/1/2025	$41.14	$15.57	$21.78	$0.00	$0.00	$78.49
	1/1/2026	$41.14	$16.17	$21.78	$0.00	$0.00	$79.09
	6/1/2026	$42.14	$16.17	$21.78	$0.00	$0.00	$80.09
	12/1/2026	$42.14	$16.17	$23.52	$0.00	$0.00	$81.83
	1/1/2027	$42.14	$16.77	$23.52	$0.00	$0.00	$82.43
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 3) For apprentice rates see "Apprentice- PILE DRIVER"	8/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
AIR TRACK OPERATOR LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.50	$10.15	$9.50	$8.57	$0.00	$65.72
	6/1/2026	$38.80	$10.15	$9.50	$8.57	$0.00	$67.02
	12/7/2026	$40.10	$10.15	$9.50	$8.57	$0.00	$68.32
	6/7/2027	$41.50	$10.15	$9.50	$8.57	$0.00	$69.72
	12/6/2027	$42.90	$10.15	$9.50	$8.57	$0.00	$71.12
	6/5/2028	$44.40	$10.15	$9.50	$8.57	$0.00	$72.62
	12/4/2028	$45.90	$10.15	$9.50	$8.57	$0.00	$74.12
For apprentice rates see "Apprentice- LABORER"							
AIR TRACK OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$37.49	$10.15	$9.50	$6.56	$0.00	$63.70
	6/1/2026	$38.79	$10.15	$9.50	$6.56	$0.00	$65.00
	12/1/2026	$40.08	$10.15	$9.50	$6.56	$0.00	$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASBESTOS WORKER (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)	12/1/2025	$40.32	$14.50	$4.30	$6.25	$0.00	$65.37
ASPHALT RAKER LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ASPHALT RAKER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.56	$13.78	$12.15	$3.00	$0.00	$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BACKHOE/FRONT-END LOADER OPERATOR OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.56	$13.78	$12.15	$3.00	$0.00	$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BARCO-TYPE JUMPING TAMPER LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
BATCH/CEMENT PLANT - ON SITE OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.03	$13.78	$12.15	$3.00	$0.00	$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BLOCK PAVER, RAMMER / CURB SETTER LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.50	$10.15	$9.50	$8.57	$0.00	$65.72
	6/1/2026	$38.80	$10.15	$9.50	$8.57	$0.00	$67.02
	12/7/2026	$40.10	$10.15	$9.50	$8.57	$0.00	$68.32
	6/7/2027	$41.50	$10.15	$9.50	$8.57	$0.00	$69.72
	12/6/2027	$42.90	$10.15	$9.50	$8.57	$0.00	$71.12
	6/5/2028	$44.40	$10.15	$9.50	$8.57	$0.00	$72.62
	12/4/2028	$45.90	$10.15	$9.50	$8.57	$0.00	$74.12
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$37.49	$10.15	$9.50	$6.56	$0.00	$63.70
	6/1/2026	$38.79	$10.15	$9.50	$6.56	$0.00	$65.00
	12/1/2026	$40.08	$10.15	$9.50	$6.56	$0.00	$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
BOILER MAKER BOILERMAKERS LOCAL 29 BOILERMAKERS LOCAL 29	1/1/2024	$48.12	$7.07	$14.60	$6.00	$0.00	$75.79

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
2	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
3	70.00	$33.68	$7.07	$10.03	$4.20	$0.00	$54.98
4	75.00	$36.09	$7.07	$10.74	$4.50	$0.00	$58.40
5	80.00	$38.50	$7.07	$11.45	$4.80	$0.00	$61.82
6	85.00	$40.90	$7.07	$12.18	$5.10	$0.00	$65.25
7	90.00	$43.31	$7.07	$12.88	$5.40	$0.00	$68.66
8	95.00	$45.71	$7.07	$13.62	$5.70	$0.00	$72.10

Apprentice to Journeyworker Ratio: 1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	8/1/2025	$56.36	$11.49	$15.57	$5.89	$0.00	$89.31
	2/1/2026	$57.71	$11.49	$15.57	$5.89	$0.00	$90.66
	8/1/2026	$59.91	$11.49	$15.57	$5.89	$0.00	$92.86
	2/1/2027	$61.31	$11.49	$15.57	$5.89	$0.00	$94.26

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$28.18	$11.49	$15.57	$5.89	$0.00	$61.13
2	60.00	$33.82	$11.49	$15.57	$5.89	$0.00	$66.77
3	70.00	$39.45	$11.49	$15.57	$5.89	$0.00	$72.40
4	80.00	$45.09	$11.49	$15.57	$5.89	$0.00	$78.04
5	90.00	$50.72	$11.49	$15.57	$5.89	$0.00	$83.67

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$28.86	$11.49	$15.57	$5.89	$0.00	$61.81
2	60.00	$34.63	$11.49	$15.57	$5.89	$0.00	$67.58
3	70.00	$40.40	$11.49	$15.57	$5.89	$0.00	$73.35
4	80.00	$46.17	$11.49	$15.57	$5.89	$0.00	$79.12
5	90.00	$51.94	$11.49	$15.57	$5.89	$0.00	$84.89

Apprentice to Journeyworker Ratio: 1:5

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.56	$13.78	$12.15	$3.00	$0.00	$68.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING BOTTOM MAN LABORERS LABORERS - FOUNDATION AND MARINE	12/1/2025	$49.85	$10.15	$9.50	$9.80	$0.00	$79.30
	6/1/2026	$51.40	$10.15	$9.50	$9.80	$0.00	$80.85
	12/1/2026	$52.90	$10.15	$9.50	$9.80	$0.00	$82.35
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING LABORER LABORERS LABORERS - FOUNDATION AND MARINE	12/1/2025	$48.70	$10.15	$9.50	$9.80	$0.00	$78.15
	6/1/2026	$50.25	$10.15	$9.50	$9.80	$0.00	$79.70
	12/1/2026	$51.75	$10.15	$9.50	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING TOP MAN LABORERS LABORERS - FOUNDATION AND MARINE	12/1/2025	$49.03	$10.15	$9.50	$9.80	$0.00	$78.48
	6/1/2026	$50.58	$10.15	$9.50	$9.80	$0.00	$80.03
	12/1/2026	$52.08	$10.15	$9.50	$9.80	$0.00	$81.53
For apprentice rates see "Apprentice- LABORER"							
CARBIDE CORE DRILL OPERATOR LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
CARPENTER CARPENTERS CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN	9/1/2025	$43.54	$8.56	$11.25	$6.90	$0.00	$70.25
	3/1/2026	$44.44	$8.56	$11.25	$6.90	$0.00	$71.15
	9/1/2026	$45.39	$8.56	$11.25	$6.90	$0.00	$72.10
	3/1/2027	$46.29	$8.56	$11.25	$6.90	$0.00	$73.00

Apprentice: CARPENTER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$19.59	$8.56	$0.00	$1.38	$0.00	$29.53
2	45.00	$19.59	$8.56	$0.00	$1.38	$0.00	$29.53
3	55.00	$23.95	$8.56	$0.00	$2.76	$0.00	$35.27
4	55.00	$23.95	$8.56	$0.00	$2.76	$0.00	$35.27
5	70.00	$30.48	$8.56	$11.25	$4.14	$0.00	$54.43
6	70.00	$30.48	$8.56	$11.25	$4.14	$0.00	$54.43
7	80.00	$34.83	$8.56	$11.25	$5.52	$0.00	$60.16
8	80.00	$34.83	$8.56	$11.25	$5.52	$0.00	$60.16

Apprentice: CARPENTER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$20.00	$8.56	$0.00	$1.38	$0.00	$29.94

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	10/1/2025	$27.75	$7.02	$3.80	$1.00	$0.00	$39.57
CARPENTERS	10/1/2026	$28.85	$7.02	$3.80	$1.00	$0.00	$40.67
CARPENTERS-ZONE 3 (Wood Frame)							

All Aspects of New Wood Frame Work

Apprentice: CARPENTER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	45.00	$20.00	$0.65	$0.00	$1.38	$0.00	$22.03
3	55.00	$24.44	$8.56	$0.00	$2.76	$0.00	$35.76
4	55.00	$24.44	$8.56	$0.00	$2.76	$0.00	$35.76
5	70.00	$31.11	$8.56	$11.25	$4.14	$0.00	$55.06
6	70.00	$31.11	$8.56	$11.25	$4.14	$0.00	$55.06
7	80.00	$35.55	$8.56	$11.25	$5.52	$0.00	$60.88
8	80.00	$35.55	$8.56	$11.25	$5.52	$0.00	$60.88

Apprentice to Journeyworker Ratio: 1:5

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$16.65	$7.02	$0.00	$0.00	$0.00	$23.67
2	60.00	$16.65	$7.02	$0.00	$0.00	$0.00	$23.67
3	65.00	$18.04	$7.02	$0.00	$1.00	$0.00	$26.06
4	70.00	$19.43	$7.02	$0.00	$1.00	$0.00	$27.45
5	75.00	$20.81	$7.02	$3.80	$1.00	$0.00	$32.63
6	80.00	$22.20	$7.02	$3.80	$1.00	$0.00	$34.02
7	85.00	$23.59	$7.02	$3.80	$1.00	$0.00	$35.41
8	90.00	$24.98	$7.02	$3.80	$1.00	$0.00	$36.80

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$17.31	$7.02	$0.00	$0.00	$0.00	$24.33
2	60.00	$17.31	$7.02	$0.00	$0.00	$0.00	$24.33
3	65.00	$18.75	$7.02	$0.00	$1.00	$0.00	$26.77
4	70.00	$20.20	$7.02	$0.00	$1.00	$0.00	$28.22
5	75.00	$21.64	$7.02	$3.80	$1.00	$0.00	$33.46
6	80.00	$23.08	$7.02	$3.80	$1.00	$0.00	$34.90
7	85.00	$24.52	$7.02	$3.80	$1.00	$0.00	$36.34
8	90.00	$25.97	$7.02	$3.80	$1.00	$0.00	$37.79

Apprentice to Journeyworker Ratio: 1:5

CEMENT MASONRY/PLASTERING	7/1/2024	$44.56	$13.20	$16.30	$2.93	$1.69	$78.68

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)							

Apprentice: CEMENT MASONRY/PLASTERING

Effective Date: 7/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$22.28	$13.20	$16.30	$0.00	$0.00	$51.78
2	60.00	$26.74	$13.20	$16.30	$2.93	$1.69	$60.86
3	65.00	$28.96	$13.20	$16.30	$2.93	$1.69	$63.08
4	70.00	$31.19	$13.20	$16.30	$2.93	$1.69	$65.31
5	75.00	$33.42	$13.20	$16.30	$2.93	$1.69	$67.54
6	80.00	$35.65	$13.20	$16.30	$2.93	$1.69	$69.77
7	90.00	$40.10	$13.20	$16.30	$2.93	$1.69	$74.22

Apprentice to Journeyworker Ratio: 1:3

CHAIN SAW OPERATOR LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.03	$13.78	$12.15	$3.00	$0.00	$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
CRANE OPERATOR OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$43.06	$13.78	$12.15	$3.00	$0.00	$71.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DELEADER (BRIDGE) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 3	7/1/2025	$58.51	$10.30	$11.95	$12.50	$0.00	$93.26
	1/1/2026	$59.56	$10.35	$12.00	$12.60	$0.00	$94.51

Apprentice: DELEADER (BRIDGE)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.26	$10.30	$0.00	$0.00	$0.00	$39.56
2	55.00	$32.18	$10.30	$0.00	$6.88	$0.00	$49.36
3	60.00	$35.11	$10.30	$0.00	$7.50	$0.00	$52.91
4	65.00	$38.03	$10.30	$0.00	$8.13	$0.00	$56.46
5	70.00	$40.96	$10.30	$11.95	$8.75	$0.00	$71.96

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: DELEADER (BRIDGE)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
6	75.00	$43.88	$10.30	$11.95	$9.38	$0.00	$75.51
7	80.00	$46.81	$10.30	$11.95	$10.00	$0.00	$79.06
8	90.00	$52.66	$10.30	$11.95	$11.25	$0.00	$86.16

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

DEMO: ADZEMAN	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
LABORERS	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	12/1/2025	$49.75	$10.15	$9.50	$9.65	$0.00	$79.05
LABORERS	6/1/2026	$51.30	$10.15	$9.50	$9.65	$0.00	$80.60
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$52.80	$10.15	$9.50	$9.65	$0.00	$82.10
	6/7/2027	$54.40	$10.15	$9.50	$9.65	$0.00	$83.70
	12/6/2027	$56.00	$10.15	$9.50	$9.65	$0.00	$85.30
	6/5/2028	$57.68	$10.15	$9.50	$9.65	$0.00	$86.98
	12/4/2028	$59.35	$10.15	$9.50	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BURNERS	12/1/2025	$49.50	$10.15	$9.50	$9.65	$0.00	$78.80
LABORERS	6/1/2026	$51.05	$10.15	$9.50	$9.65	$0.00	$80.35
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$52.55	$10.15	$9.50	$9.65	$0.00	$81.85
	6/7/2027	$54.15	$10.15	$9.50	$9.65	$0.00	$83.45
	12/6/2027	$55.75	$10.15	$9.50	$9.65	$0.00	$85.05
	6/5/2028	$57.43	$10.15	$9.50	$9.65	$0.00	$86.73
	12/4/2028	$59.10	$10.15	$9.50	$9.65	$0.00	$88.40

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"							
DEMO: CONCRETE CUTTER/SAWYER	12/1/2025	$49.75	$10.15	$9.50	$9.65	$0.00	$79.05
LABORERS	6/1/2026	$51.30	$10.15	$9.50	$9.65	$0.00	$80.60
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$52.80	$10.15	$9.50	$9.65	$0.00	$82.10
	6/7/2027	$54.40	$10.15	$9.50	$9.65	$0.00	$83.70
	12/6/2027	$56.00	$10.15	$9.50	$9.65	$0.00	$85.30
	6/5/2028	$57.68	$10.15	$9.50	$9.65	$0.00	$86.98
	12/4/2028	$59.35	$10.15	$9.50	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: JACKHAMMER OPERATOR	12/1/2025	$49.50	$10.15	$9.50	$9.65	$0.00	$78.80
LABORERS	6/1/2026	$51.05	$10.15	$9.50	$9.65	$0.00	$80.35
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$52.55	$10.15	$9.50	$9.65	$0.00	$81.85
	6/7/2027	$54.15	$10.15	$9.50	$9.65	$0.00	$83.45
	12/6/2027	$55.75	$10.15	$9.50	$9.65	$0.00	$85.05
	6/5/2028	$57.43	$10.15	$9.50	$9.65	$0.00	$86.73
	12/4/2028	$59.10	$10.15	$9.50	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: WRECKING LABORER	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
LABORERS	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DIVER	8/1/2024	$78.11	$10.08	$11.62	$12.67	$0.00	$112.48
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 3)							
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A $69.83, 3A $91.79,4A $102.14 Total Rate							
DIVER TENDER	8/1/2024	$49.19	$10.08	$11.62	$12.67	$0.00	$83.56
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 3)							
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A $54.20, 3A $73.93,4A $82.05 Total Rate							
DIVER TENDER (EFFLUENT)	8/1/2024	$83.69	$10.08	$11.62	$12.67	$0.00	$118.06
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 3)							
For apprentice rates see "Apprentice- PILE DRIVER"							
DIVER/SLURRY (EFFLUENT)	8/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 3)							
For apprentice rates see "Apprentice- PILE DRIVER"							
DRAWBRIDGE OPERATOR (Construction)	7/1/2020	$26.77	$6.67	$3.93	$0.00	$0.16	$37.53
DRAWBRIDGE - SEIU LOCAL 888							
DRAWBRIDGE - SEIU LOCAL 888							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ELECTRICIAN (Including Core Drilling)	6/29/2025	$52.16	$13.50	$8.31	$6.90	$0.00	$80.87
ELECTRICIANS LOCAL 7	12/28/2025	$53.26	$13.75	$8.40	$6.96	$0.00	$82.37
ELECTRICIANS LOCAL 7	6/28/2026	$54.41	$14.00	$8.43	$7.03	$0.00	$83.87
	1/3/2027	$55.56	$14.25	$8.47	$7.09	$0.00	$85.37

Apprentice: ELECTRICIAN (Including Core Drilling)

Effective Date: 6/29/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$20.86	$7.50	$0.63	$0.00	$0.00	$28.99
2	45.00	$23.47	$7.50	$0.70	$0.00	$0.00	$31.67
3	50.00	$26.08	$13.50	$7.53	$0.00	$0.00	$47.11
4	55.00	$28.69	$13.50	$7.61	$0.00	$0.00	$49.80
5	65.00	$33.90	$13.50	$9.84	$0.00	$0.00	$57.24
6	70.00	$36.51	$13.50	$11.30	$0.00	$0.00	$61.31

Apprentice: ELECTRICIAN (Including Core Drilling)

Effective Date: 12/28/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$21.30	$7.65	$0.63	$0.00	$0.00	$29.58
2	45.00	$23.97	$7.65	$0.70	$0.00	$0.00	$32.32
3	50.00	$26.63	$13.75	$7.53	$0.00	$0.00	$47.91
4	55.00	$29.29	$13.75	$7.61	$0.00	$0.00	$50.65
5	65.00	$34.62	$13.75	$9.84	$0.00	$0.00	$58.21
6	70.00	$37.28	$13.75	$11.30	$0.00	$0.00	$62.33

Apprentice to Journeyworker Ratio: 2:3

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ELEVATOR CONSTRUCTOR	1/1/2025	$66.41	$16.28	$10.96	$10.40	$0.00	$104.05
ELEVATOR CONSTRUCTORS LOCAL 41	1/1/2026	$69.23	$16.38	$11.06	$10.70	$0.00	$107.37
ELEVATOR CONSTRUCTORS LOCAL 41	1/1/2027	$72.23	$16.48	$11.16	$11.00	$0.00	$110.87

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.21	$16.28	$0.00	$0.00	$0.00	$49.49
2	55.00	$36.53	$16.28	$10.96	$10.40	$0.00	$74.17
3	65.00	$43.17	$16.28	$10.96	$10.40	$0.00	$80.81
4	70.00	$46.49	$16.28	$10.96	$10.40	$0.00	$84.13
5	80.00	$53.13	$16.28	$10.96	$10.40	$0.00	$90.77

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.62	$16.38	$0.00	$0.00	$0.00	$51.00
2	55.00	$38.08	$16.38	$11.06	$10.70	$0.00	$76.22
3	65.00	$45.00	$16.38	$11.06	$10.70	$0.00	$83.14
4	70.00	$48.46	$16.38	$11.06	$10.70	$0.00	$86.60
5	80.00	$55.38	$16.38	$11.06	$10.70	$0.00	$93.52

Apprentice to Journeyworker Ratio: 1:1

ELEVATOR CONSTRUCTOR HELPER ELEVATOR CONSTRUCTORS LOCAL 41 ELEVATOR CONSTRUCTORS LOCAL 41	1/1/2025	$46.49	$16.28	$10.96	$10.40	$0.00	$84.13
	1/1/2026	$48.46	$16.38	$11.06	$10.70	$0.00	$86.60
	1/1/2027	$50.56	$16.48	$11.16	$11.00	$0.00	$89.20
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"							
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	6/1/1999	$18.84	$4.80	$4.10	$0.00	$0.00	$27.74
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	6/1/1999	$21.33	$4.80	$4.10	$0.00	$0.00	$30.23
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	6/1/1999	$22.33	$4.80	$4.10	$0.00	$0.00	$31.23
FIRE ALARM INSTALLER ELECTRICIANS LOCAL 7 ELECTRICIANS LOCAL 7	6/29/2025	$52.16	$13.50	$8.31	$6.90	$0.00	$80.87
	12/28/2025	$53.26	$13.75	$8.40	$6.96	$0.00	$82.37
	6/28/2026	$54.41	$14.00	$8.43	$7.03	$0.00	$83.87
	1/3/2027	$55.56	$14.25	$8.47	$7.09	$0.00	$85.37
For apprentice rates see "Apprentice- ELECTRICIAN"							
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING ELECTRICIANS LOCAL 7 ELECTRICIANS LOCAL 7	6/29/2025	$52.16	$13.50	$8.31	$6.90	$0.00	$80.87
	12/28/2025	$53.26	$13.75	$8.40	$6.96	$0.00	$82.37
	6/28/2026	$54.41	$14.00	$8.43	$7.03	$0.00	$83.87
	1/3/2027	$55.56	$14.25	$8.47	$7.09	$0.00	$85.37
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"							
FIREMAN OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.03	$13.78	$12.15	$3.00	$0.00	$67.96

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: FIREMAN							
Effective Date: 12/1/2023							
Step / Percent		**Apprentice Base Wage**					
1 / 60.00		$23.42	$13.78	$12.15	$3.00	$0.00	$52.35
2 / 70.00		$27.32	$13.78	$12.15	$3.00	$0.00	$56.25
3 / 80.00		$31.22	$13.78	$12.15	$3.00	$0.00	$60.15
4 / 90.00		$35.13	$13.78	$12.15	$3.00	$0.00	$64.06
Apprentice to Journeyworker Ratio: 1:6							
FLAGGER & SIGNALER (HEAVY & HIGHWAY)	12/1/2025	$28.09	$10.15	$9.50	$6.56	$0.00	$54.30
LABORERS	6/1/2026	$29.21	$10.15	$9.50	$6.56	$0.00	$55.42
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2026	$29.21	$10.15	$9.50	$6.56	$0.00	$55.42
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FLOORCOVERER	9/1/2025	$43.44	$8.56	$11.25	$6.90	$0.00	$70.15
FLOORCOVERERS LOCAL 2168	3/1/2026	$44.34	$8.56	$11.25	$6.90	$0.00	$71.05
FLOORCOVERERS LOCAL 2168 ZONE III	9/1/2026	$45.29	$8.56	$11.25	$6.90	$0.00	$72.00
	3/1/2027	$46.19	$8.56	$11.25	$6.90	$0.00	$72.90
Apprentice: FLOORCOVERER							
Effective Date: 9/1/2025							
Step / Percent		**Apprentice Base Wage**					
1 / 45.00		$19.55	$8.56	$0.00	$1.38	$0.00	$29.49
2 / 45.00		$19.55	$8.56	$0.00	$1.38	$0.00	$29.49
3 / 55.00		$23.89	$8.56	$0.00	$2.76	$0.00	$35.21
4 / 55.00		$23.89	$8.56	$0.00	$2.76	$0.00	$35.21
5 / 70.00		$30.41	$8.56	$11.25	$4.14	$0.00	$54.36
6 / 70.00		$30.41	$8.56	$11.25	$4.14	$0.00	$54.36
7 / 80.00		$34.75	$8.56	$11.25	$5.52	$0.00	$60.08
8 / 80.00		$34.75	$8.56	$11.25	$5.52	$0.00	$60.08
Apprentice: FLOORCOVERER							
Effective Date: 3/1/2026							
Step / Percent		**Apprentice Base Wage**					
1 / 45.00		$19.95	$8.56	$0.00	$1.38	$0.00	$29.89
2 / 45.00		$19.95	$8.56	$0.00	$1.38	$0.00	$29.89
3 / 55.00		$24.39	$8.56	$0.00	$2.76	$0.00	$35.71
4 / 55.00		$24.39	$8.56	$0.00	$2.76	$0.00	$35.71
5 / 70.00		$31.04	$8.56	$11.25	$4.14	$0.00	$54.99
6 / 70.00		$31.04	$8.56	$11.25	$4.14	$0.00	$54.99
7 / 80.00		$35.47	$8.56	$11.25	$5.52	$0.00	$60.80
8 / 80.00		$35.47	$8.56	$11.25	$5.52	$0.00	$60.80

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice Notes							
Steps are 750 hrs.							
Apprentice to Journeyworker Ratio: 1:1							
FORK LIFT OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.25	$13.78	$12.15	$3.00	$0.00	$68.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GENERATORS/LIGHTING PLANTS OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$35.80	$13.78	$12.15	$3.00	$0.00	$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) GLAZIERS LOCAL 1333 GLAZIERS LOCAL 1333	6/1/2025	$43.13	$10.80	$8.25	$5.50	$0.00	$67.68
	6/1/2026	$44.73	$11.20	$8.40	$6.05	$0.00	$70.38
	6/1/2027	$46.73	$11.60	$8.55	$6.60	$0.00	$73.48
	6/1/2028	$48.73	$12.00	$8.70	$7.20	$0.00	$76.63

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$21.57	$10.80	$8.25	$5.50	$0.00	$46.12
2	56.25	$24.26	$10.80	$8.25	$5.50	$0.00	$48.81
3	62.50	$26.96	$10.80	$8.25	$5.50	$0.00	$51.51
4	68.75	$29.65	$10.80	$8.25	$5.50	$0.00	$54.20
5	75.00	$32.35	$10.80	$8.25	$5.50	$0.00	$56.90
6	81.25	$35.04	$10.80	$8.25	$5.50	$0.00	$59.59
7	87.50	$37.74	$10.80	$8.25	$5.50	$0.00	$62.29
8	93.75	$40.43	$10.80	$8.25	$5.50	$0.00	$64.98

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$22.37	$11.20	$8.40	$6.05	$0.00	$48.02
2	56.25	$25.16	$11.20	$8.40	$6.05	$0.00	$50.81
3	62.50	$27.96	$11.20	$8.40	$6.05	$0.00	$53.61
4	68.75	$30.75	$11.20	$8.40	$6.05	$0.00	$56.40
5	75.00	$33.55	$11.20	$8.40	$6.05	$0.00	$59.20
6	81.25	$36.34	$11.20	$8.40	$6.05	$0.00	$61.99
7	87.50	$39.14	$11.20	$8.40	$6.05	$0.00	$64.79
8	93.75	$41.93	$11.20	$8.40	$6.05	$0.00	$67.58

Apprentice to Journeyworker Ratio: 3:1

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
GRADER/TRENCHING MACHINE/DERRICK OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.56	$13.78	$12.15	$3.00	$0.00	$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 63 SHEETMETAL WORKERS LOCAL 63	7/1/2025	$43.48	$12.94	$11.01	$8.72	$2.13	$78.28
	7/1/2026	$43.48	$13.24	$11.01	$9.92	$2.13	$79.78
	1/1/2027	$43.48	$13.54	$11.01	$11.12	$2.13	$81.28
	7/1/2027	$44.98	$13.54	$11.01	$11.12	$2.13	$82.78
	1/1/2028	$46.48	$13.54	$11.01	$11.12	$2.13	$84.28
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 7 ELECTRICIANS LOCAL 7	6/29/2025	$52.16	$13.50	$8.31	$6.90	$0.00	$80.87
	12/28/2025	$53.26	$13.75	$8.40	$6.96	$0.00	$82.37
	6/28/2026	$54.41	$14.00	$8.43	$7.03	$0.00	$83.87
	1/3/2027	$55.56	$14.25	$8.47	$7.09	$0.00	$85.37
For apprentice rates see "Apprentice- ELECTRICIAN"							
HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 63 SHEETMETAL WORKERS LOCAL 63	7/1/2025	$43.48	$12.94	$11.01	$8.72	$2.13	$78.28
	7/1/2026	$43.48	$13.24	$11.01	$9.92	$2.13	$79.78
	1/1/2027	$43.48	$13.54	$11.01	$11.12	$2.13	$81.28
	7/1/2027	$44.98	$13.54	$11.01	$11.12	$2.13	$82.78
	1/1/2028	$46.48	$13.54	$11.01	$11.12	$2.13	$84.28
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (TESTING AND BALANCING -WATER) PLUMBERS & PIPEFITTERS LOCAL 104 PLUMBERS & PIPEFITTERS LOCAL 104	9/17/2025	$52.26	$12.00	$10.85	$7.10	$0.00	$82.21
	3/17/2026	$54.26	$12.00	$10.85	$7.10	$0.00	$84.21
	9/17/2026	$56.26	$12.00	$10.85	$7.10	$0.00	$86.21
	3/17/2027	$58.26	$12.00	$10.85	$7.10	$0.00	$88.21
	9/17/2027	$60.26	$12.00	$10.85	$7.10	$0.00	$90.21
	3/17/2028	$62.26	$12.00	$10.85	$7.10	$0.00	$92.21
	9/17/2028	$64.26	$12.00	$10.85	$7.10	$0.00	$94.21
	3/17/2029	$66.26	$12.00	$10.85	$7.10	$0.00	$96.21
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HVAC MECHANIC PLUMBERS & PIPEFITTERS LOCAL 104 PLUMBERS & PIPEFITTERS LOCAL 104	9/17/2025	$52.26	$12.00	$10.85	$7.10	$0.00	$82.21
	3/17/2026	$54.26	$12.00	$10.85	$7.10	$0.00	$84.21
	9/17/2026	$56.26	$12.00	$10.85	$7.10	$0.00	$86.21
	3/17/2027	$58.26	$12.00	$10.85	$7.10	$0.00	$88.21
	9/17/2027	$60.26	$12.00	$10.85	$7.10	$0.00	$90.21
	3/17/2028	$62.26	$12.00	$10.85	$7.10	$0.00	$92.21
	9/17/2028	$64.26	$12.00	$10.85	$7.10	$0.00	$94.21
	3/17/2029	$66.26	$12.00	$10.85	$7.10	$0.00	$96.21
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HYDRAULIC DRILLS (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$37.49	$10.15	$9.50	$6.56	$0.00	$63.70
	6/1/2026	$38.79	$10.15	$9.50	$6.56	$0.00	$65.00
	12/1/2026	$40.08	$10.15	$9.50	$6.56	$0.00	$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
INSULATOR (PIPES & TANKS)	9/1/2025	$48.27	$14.75	$9.52	$10.09	$0.00	$82.63

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)	9/1/2026	$51.01	$14.75	$9.52	$10.09	$0.00	$85.37

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.14	$14.75	$9.27	$5.05	$0.00	$53.21
2	60.00	$28.96	$14.75	$9.32	$6.05	$0.00	$59.08
3	70.00	$33.79	$14.75	$9.37	$7.06	$0.00	$64.97
4	80.00	$38.62	$14.75	$9.42	$8.07	$0.00	$70.86

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$25.51	$14.75	$9.27	$5.05	$0.00	$54.58
2	60.00	$30.61	$14.75	$9.32	$6.05	$0.00	$60.73
3	70.00	$35.71	$14.75	$9.37	$7.06	$0.00	$66.89
4	80.00	$40.81	$14.75	$9.42	$8.07	$0.00	$73.05

Apprentice to Journeyworker Ratio: 1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 7 IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)	3/16/2024	$40.66	$8.25	$12.70	$10.00	$0.00	$71.61

Apprentice: IRONWORKER/WELDER

Effective Date: 3/16/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$24.40	$8.25	$12.70	$10.00	$0.00	$55.35
2	70.00	$28.46	$8.25	$12.70	$10.00	$0.00	$59.41
3	75.00	$30.50	$8.25	$12.70	$10.00	$0.00	$61.45
4	80.00	$32.53	$8.25	$12.70	$10.00	$0.00	$63.48
5	85.00	$34.56	$8.25	$12.70	$10.00	$0.00	$65.51
6	90.00	$36.59	$8.25	$12.70	$10.00	$0.00	$67.54

Apprentice to Journeyworker Ratio: 1:4

JACKHAMMER & PAVING BREAKER OPERATOR	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62

For apprentice rates see "Apprentice- LABORER"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORER LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$36.75	$10.15	$9.50	$8.57	$0.00	$64.97
	6/1/2026	$38.05	$10.15	$9.50	$8.57	$0.00	$66.27
	12/7/2026	$39.35	$10.15	$9.50	$8.57	$0.00	$67.57
	6/7/2027	$40.75	$10.15	$9.50	$8.57	$0.00	$68.97
	12/6/2027	$42.15	$10.15	$9.50	$8.57	$0.00	$70.37
	6/5/2028	$43.65	$10.15	$9.50	$8.57	$0.00	$71.87
	12/4/2028	$45.15	$10.15	$9.50	$8.57	$0.00	$73.37

Apprentice: LABORER

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$22.05	$9.90	$9.25	$8.32	$0.00	$49.52
2	70.00	$25.73	$9.90	$9.25	$8.32	$0.00	$53.20
3	80.00	$29.40	$9.90	$9.25	$8.32	$0.00	$56.87
4	90.00	$33.08	$9.90	$9.25	$8.32	$0.00	$60.55

Apprentice: LABORER

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$22.83	$10.15	$9.50	$8.57	$0.00	$51.05
2	70.00	$26.64	$10.15	$9.50	$8.57	$0.00	$54.86
3	80.00	$30.44	$10.15	$9.50	$8.57	$0.00	$58.66
4	90.00	$34.25	$10.15	$9.50	$8.57	$0.00	$62.47

Apprentice to Journeyworker Ratio: 1:5

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$36.74	$10.15	$9.50	$6.56	$0.00	$62.95
	6/1/2026	$38.04	$10.15	$9.50	$6.56	$0.00	$64.25
	12/1/2026	$39.33	$10.15	$9.50	$6.56	$0.00	$65.54

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$22.04	$9.90	$9.25	$6.31	$0.00	$47.50
2	70.00	$25.72	$9.90	$9.25	$6.31	$0.00	$51.18
3	80.00	$29.40	$9.90	$9.25	$6.31	$0.00	$54.86
4	90.00	$33.07	$9.90	$9.25	$6.31	$0.00	$58.53

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$22.82	$10.15	$9.50	$6.56	$0.00	$49.03
2	70.00	$26.63	$10.15	$9.50	$6.56	$0.00	$52.84
3	80.00	$30.43	$10.15	$9.50	$6.56	$0.00	$56.64
4	90.00	$34.24	$10.15	$9.50	$6.56	$0.00	$60.45

Apprentice to Journeyworker Ratio: 1:5

LABORER: CARPENTER TENDER	12/1/2025	$36.75	$10.15	$9.50	$8.57	$0.00	$64.97
LABORERS	6/1/2026	$38.05	$10.15	$9.50	$8.57	$0.00	$66.27
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.35	$10.15	$9.50	$8.57	$0.00	$67.57
	6/7/2027	$40.75	$10.15	$9.50	$8.57	$0.00	$68.97
	12/6/2027	$42.15	$10.15	$9.50	$8.57	$0.00	$70.37
	6/5/2028	$43.65	$10.15	$9.50	$8.57	$0.00	$71.87
	12/4/2028	$45.15	$10.15	$9.50	$8.57	$0.00	$73.37
For apprentice rates see "Apprentice- LABORER"							
LABORER: CEMENT FINISHER TENDER	12/1/2025	$36.75	$10.15	$9.50	$8.57	$0.00	$64.97
LABORERS	6/1/2026	$38.05	$10.15	$9.50	$8.57	$0.00	$66.27
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.35	$10.15	$9.50	$8.57	$0.00	$67.57
	6/7/2027	$40.75	$10.15	$9.50	$8.57	$0.00	$68.97
	12/6/2027	$42.15	$10.15	$9.50	$8.57	$0.00	$70.37
	6/5/2028	$43.65	$10.15	$9.50	$8.57	$0.00	$71.87
	12/4/2028	$45.15	$10.15	$9.50	$8.57	$0.00	$73.37
For apprentice rates see "Apprentice- LABORER"							
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	12/1/2025	$36.67	$10.15	$9.50	$8.70	$0.00	$65.02
LABORERS	6/1/2026	$37.97	$10.15	$9.50	$8.70	$0.00	$66.32
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.27	$10.15	$9.50	$8.70	$0.00	$67.62
	6/7/2027	$40.67	$10.15	$9.50	$8.70	$0.00	$69.02
	12/6/2027	$42.07	$10.15	$9.50	$8.70	$0.00	$70.42
	6/5/2028	$43.57	$10.15	$9.50	$8.70	$0.00	$71.92
	12/4/2028	$45.07	$10.15	$9.50	$8.70	$0.00	$73.42
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER	12/1/2025	$39.75	$10.15	$9.50	$8.57	$0.00	$67.97
LABORERS	6/1/2026	$41.05	$10.15	$9.50	$8.57	$0.00	$69.27
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$42.35	$10.15	$9.50	$8.57	$0.00	$70.57
	6/7/2027	$43.75	$10.15	$9.50	$8.57	$0.00	$71.97
	12/6/2027	$45.15	$10.15	$9.50	$8.57	$0.00	$73.37
	6/5/2028	$46.65	$10.15	$9.50	$8.57	$0.00	$74.87
	12/4/2028	$48.15	$10.15	$9.50	$8.57	$0.00	$76.37
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
LABORERS	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
LABORERS - ZONE 3 (HEAVY & HIGHWAY)							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
LABORER: MULTI-TRADE TENDER	12/1/2025	$36.75	$10.15	$9.50	$8.57	$0.00	$64.97
LABORERS	6/1/2026	$38.05	$10.15	$9.50	$8.57	$0.00	$66.27
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.35	$10.15	$9.50	$8.57	$0.00	$67.57
	6/7/2027	$40.75	$10.15	$9.50	$8.57	$0.00	$68.97
	12/6/2027	$42.15	$10.15	$9.50	$8.57	$0.00	$70.37
	6/5/2028	$43.65	$10.15	$9.50	$8.57	$0.00	$71.87
	12/4/2028	$45.15	$10.15	$9.50	$8.57	$0.00	$73.37
For apprentice rates see "Apprentice- LABORER"							
LABORER: TREE REMOVER	12/1/2025	$36.75	$10.15	$9.50	$8.57	$0.00	$64.97
LABORERS	6/1/2026	$38.05	$10.15	$9.50	$8.57	$0.00	$66.27
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.35	$10.15	$9.50	$8.57	$0.00	$67.57
	6/7/2027	$40.75	$10.15	$9.50	$8.57	$0.00	$68.97
	12/6/2027	$42.15	$10.15	$9.50	$8.57	$0.00	$70.37
	6/5/2028	$43.65	$10.15	$9.50	$8.57	$0.00	$71.87
	12/4/2028	$45.15	$10.15	$9.50	$8.57	$0.00	$73.37
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
LABORERS	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
LABORERS	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
MARBLE & TILE FINISHERS	8/1/2025	$45.56	$11.49	$15.10	$5.68	$0.00	$77.83
BRICKLAYERS LOCAL 3	2/1/2026	$46.64	$11.49	$15.10	$5.68	$0.00	$78.91
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	8/1/2026	$48.40	$11.49	$15.10	$5.68	$0.00	$80.67
	2/1/2027	$49.52	$11.49	$15.10	$5.68	$0.00	$81.79

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$22.78	$11.49	$15.10	$5.68	$0.00	$55.05
2	60.00	$27.34	$11.49	$15.10	$5.68	$0.00	$59.61
3	70.00	$31.89	$11.49	$15.10	$5.68	$0.00	$64.16
4	80.00	$36.45	$11.49	$15.10	$5.68	$0.00	$68.72

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
5	90.00	$41.00	$11.49	$15.10	$5.68	$0.00	$73.27

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$23.32	$11.49	$15.10	$5.68	$0.00	$55.59
2	60.00	$27.98	$11.49	$15.10	$5.68	$0.00	$60.25
3	70.00	$32.65	$11.49	$15.10	$5.68	$0.00	$64.92
4	80.00	$37.31	$11.49	$15.10	$5.68	$0.00	$69.58
5	90.00	$41.98	$11.49	$15.10	$5.68	$0.00	$74.25

Apprentice to Journeyworker Ratio: 1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.56	$13.78	$12.15	$3.00	$0.00	$68.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.03	$13.78	$12.15	$3.00	$0.00	$67.96

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 3)	1/6/2025	$43.42	$10.08	$11.47	$9.75	$0.00	$74.72
MILLWRIGHTS LOCAL 1121 MILLWRIGHTS LOCAL 1121 - Zone 3	1/5/2026	$45.70	$10.08	$11.47	$9.75	$0.00	$77.00

Apprentice: MILLWRIGHT (Zone 3)

Effective Date: 1/6/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$23.88	$10.08	$0.00	$5.36	$0.00	$39.32
2	65.00	$28.22	$10.08	$0.00	$6.34	$0.00	$44.64
3	75.00	$32.57	$10.08	$11.47	$7.31	$0.00	$61.43
4	85.00	$36.91	$10.08	$11.47	$8.29	$0.00	$66.75

Apprentice: MILLWRIGHT (Zone 3)

Effective Date: 1/5/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$25.14	$10.08	$0.00	$5.36	$0.00	$40.58

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: MILLWRIGHT (Zone 3)							
Effective Date: 1/5/2026							
Step / Percent		**Apprentice Base Wage**					
2 / 65.00		$29.71	$10.08	$0.00	$6.34	$0.00	$46.13
3 / 75.00		$34.28	$10.08	$11.47	$7.31	$0.00	$63.14
4 / 85.00		$38.85	$10.08	$11.47	$8.29	$0.00	$68.69
Apprentice Notes							
Step 1&2 Appr. indentured after 1/6/2020 receive no pension,							
Apprentice to Journeyworker Ratio: 1:4							
MORTAR MIXER LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
OILER OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$35.02	$13.78	$12.15	$3.00	$0.00	$63.95
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OTHER POWER DRIVEN EQUIPMENT - CLASS VI OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$32.74	$13.78	$12.15	$3.00	$0.00	$61.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 3	7/1/2025	$58.51	$10.30	$11.95	$12.50	$0.00	$93.26
	1/1/2026	$59.56	$10.35	$12.00	$12.60	$0.00	$94.51
Apprentice: PAINTER (BRIDGES/TANKS)							
Effective Date: 7/1/2025							
Step / Percent		**Apprentice Base Wage**					
1 / 50.00		$29.26	$10.30	$0.00	$0.00	$0.00	$39.56
2 / 55.00		$32.18	$10.30	$0.00	$6.88	$0.00	$49.36
3 / 60.00		$35.11	$10.30	$0.00	$7.50	$0.00	$52.91
4 / 65.00		$38.03	$10.30	$0.00	$8.13	$0.00	$56.46
5 / 70.00		$40.96	$10.30	$11.95	$8.75	$0.00	$71.96
6 / 75.00		$43.88	$10.30	$11.95	$9.38	$0.00	$75.51
7 / 80.00		$46.81	$10.30	$11.95	$10.00	$0.00	$79.06
8 / 90.00		$52.66	$10.30	$11.95	$11.25	$0.00	$86.16

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PAINTER (SPRAY OR SANDBLAST, NEW) *	7/1/2025	$41.13	$10.30	$11.95	$8.25	$0.00	$71.63
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.	1/1/2026	$42.03	$10.35	$12.00	$8.35	$0.00	$72.73
PAINTERS LOCAL 35							
PAINTERS LOCAL 35 - ZONE 3							

Apprentice: PAINTER (BRIDGES/TANKS)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$20.57	$10.30	$0.00	$0.00	$0.00	$30.87
2	55.00	$22.62	$10.30	$0.00	$4.54	$0.00	$37.46
3	60.00	$24.68	$10.30	$0.00	$4.95	$0.00	$39.93
4	65.00	$26.73	$10.30	$0.00	$5.36	$0.00	$42.39
5	70.00	$28.79	$10.30	$11.95	$5.78	$0.00	$56.82
6	75.00	$30.85	$10.30	$11.95	$6.19	$0.00	$59.29
7	80.00	$32.90	$10.30	$11.95	$6.60	$0.00	$61.75
8	90.00	$37.02	$10.30	$11.95	$7.43	$0.00	$66.70

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$21.02	$10.35	$0.00	$0.00	$0.00	$31.37
2	55.00	$23.12	$10.35	$0.00	$4.59	$0.00	$38.06
3	60.00	$25.22	$10.35	$0.00	$5.01	$0.00	$40.58
4	65.00	$27.32	$10.35	$0.00	$5.43	$0.00	$43.10
5	70.00	$29.42	$10.35	$12.00	$5.85	$0.00	$57.62
6	75.00	$31.52	$10.35	$12.00	$6.26	$0.00	$60.13
7	80.00	$33.62	$10.35	$12.00	$6.68	$0.00	$62.65
8	90.00	$37.83	$10.35	$12.00	$7.52	$0.00	$67.70

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice to Journeyworker Ratio: 1:1							
PAINTER (SPRAY OR SANDBLAST, REPAINT)	7/1/2025	$38.45	$10.30	$11.95	$8.25	$0.00	$68.95
PAINTERS LOCAL 35	1/1/2026	$39.35	$10.35	$12.00	$8.35	$0.00	$70.05
PAINTERS LOCAL 35 - ZONE 3							

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$19.23	$10.30	$0.00	$0.00	$0.00	$29.53
2	55.00	$21.15	$10.30	$0.00	$4.54	$0.00	$35.99
3	60.00	$23.07	$10.30	$0.00	$4.95	$0.00	$38.32
4	65.00	$24.99	$10.30	$0.00	$5.36	$0.00	$40.65
5	70.00	$26.92	$10.30	$11.95	$5.78	$0.00	$54.95
6	75.00	$28.84	$10.30	$11.95	$6.19	$0.00	$57.28
7	80.00	$30.76	$10.30	$11.95	$6.60	$0.00	$59.61
8	90.00	$34.61	$10.30	$11.95	$7.43	$0.00	$64.29

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$19.68	$10.35	$0.00	$0.00	$0.00	$30.03
2	55.00	$21.64	$10.35	$0.00	$4.59	$0.00	$36.58
3	60.00	$23.61	$10.35	$0.00	$5.01	$0.00	$38.97
4	65.00	$25.58	$10.35	$0.00	$5.43	$0.00	$41.36
5	70.00	$27.55	$10.35	$12.00	$5.85	$0.00	$55.75
6	75.00	$29.51	$10.35	$12.00	$6.26	$0.00	$58.12
7	80.00	$31.48	$10.35	$12.00	$6.68	$0.00	$60.51
8	90.00	$35.42	$10.35	$12.00	$7.52	$0.00	$65.29

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice to Journeyworker Ratio: 1:1							
PAINTER / TAPER (BRUSH, NEW) *	7/1/2025	$39.73	$10.30	$11.95	$8.25	$0.00	$70.23
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.	1/1/2026	$40.63	$10.35	$12.00	$8.35	$0.00	$71.33
PAINTERS LOCAL 35							
PAINTERS LOCAL 35 - ZONE 3							

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$19.87	$10.30	$0.00	$0.00	$0.00	$30.17
2	55.00	$21.85	$10.30	$0.00	$4.54	$0.00	$36.69
3	60.00	$23.84	$10.30	$0.00	$4.95	$0.00	$39.09

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
4	65.00	$25.82	$10.30	$0.00	$5.36	$0.00	$41.48
5	70.00	$27.81	$10.30	$11.95	$5.78	$0.00	$55.84
6	75.00	$29.80	$10.30	$11.95	$6.19	$0.00	$58.24
7	80.00	$31.78	$10.30	$11.95	$6.60	$0.00	$60.63
8	90.00	$35.76	$10.30	$11.95	$7.43	$0.00	$65.44

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$20.32	$10.35	$0.00	$0.00	$0.00	$30.67
2	55.00	$22.35	$10.35	$0.00	$4.59	$0.00	$37.29
3	60.00	$24.38	$10.35	$0.00	$5.01	$0.00	$39.74
4	65.00	$26.41	$10.35	$0.00	$5.43	$0.00	$42.19
5	70.00	$28.44	$10.35	$12.00	$5.85	$0.00	$56.64
6	75.00	$30.47	$10.35	$12.00	$6.26	$0.00	$59.08
7	80.00	$32.50	$10.35	$12.00	$6.68	$0.00	$61.53
8	90.00	$36.57	$10.35	$12.00	$7.52	$0.00	$66.44

Apprentice to Journeyworker Ratio: 1:1

PAINTER / TAPER (BRUSH, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 3	7/1/2025	$37.05	$10.30	$11.95	$8.25	$0.00	$67.55
	1/1/2026	$37.95	$10.35	$12.00	$8.35	$0.00	$68.65

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$18.53	$10.30	$0.00	$0.00	$0.00	$28.83
2	55.00	$20.38	$10.30	$0.00	$4.54	$0.00	$35.22
3	60.00	$22.23	$10.30	$0.00	$4.95	$0.00	$37.48
4	65.00	$24.08	$10.30	$0.00	$5.36	$0.00	$39.74
5	70.00	$25.94	$10.30	$11.95	$5.78	$0.00	$53.97
6	75.00	$27.79	$10.30	$11.95	$6.19	$0.00	$56.23
7	80.00	$29.64	$10.30	$11.95	$6.60	$0.00	$58.49
8	90.00	$33.35	$10.30	$11.95	$7.43	$0.00	$63.03

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: PAINTER / TAPER (BRUSH, REPAINT)							
Effective Date: 1/1/2026							
Step / Percent		**Apprentice Base Wage**					
1 / 50.00		$18.98	$10.35	$0.00	$0.00	$0.00	$29.33
2 / 55.00		$20.87	$10.35	$0.00	$4.59	$0.00	$35.81
3 / 60.00		$22.77	$10.35	$0.00	$5.01	$0.00	$38.13
4 / 65.00		$24.67	$10.35	$0.00	$5.43	$0.00	$40.45
5 / 70.00		$26.57	$10.35	$12.00	$5.85	$0.00	$54.77
6 / 75.00		$28.46	$10.35	$12.00	$6.26	$0.00	$57.07
7 / 80.00		$30.36	$10.35	$12.00	$6.68	$0.00	$59.39
8 / 90.00		$34.16	$10.35	$12.00	$7.52	$0.00	$64.03
Apprentice to Journeyworker Ratio: 1:1							
PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	12/1/2025	$36.74	$10.15	$9.50	$6.56	$0.00	$62.95
LABORERS	6/1/2026	$38.04	$10.15	$9.50	$6.56	$0.00	$64.25
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2026	$39.33	$10.15	$9.50	$6.56	$0.00	$65.54
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
PANEL & PICKUP TRUCKS DRIVER	12/1/2025	$40.78	$15.57	$21.78	$0.00	$0.00	$78.13
TEAMSTERS JOINT COUNCIL NO. 10	1/1/2026	$40.78	$16.17	$21.78	$0.00	$0.00	$78.73
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$41.78	$16.17	$21.78	$0.00	$0.00	$79.73
	12/1/2026	$41.78	$16.17	$23.52	$0.00	$0.00	$81.47
	1/1/2027	$41.78	$16.77	$23.52	$0.00	$0.00	$82.07
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	8/1/2024	$49.19	$10.08	$11.62	$12.67	$0.00	$83.56
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 3)							
For apprentice rates see "Apprentice- PILE DRIVER"							
PILE DRIVER	8/1/2024	$49.19	$10.08	$11.62	$12.67	$0.00	$83.56
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 3)							
Apprentice: PILE DRIVER							
Effective Date: 8/1/2024							
Step / Percent		**Apprentice Base Wage**					
1 / 45.00		$22.14	$10.08	$0.00	$2.53	$0.00	$34.75
2 / 55.00		$27.05	$10.08	$0.00	$5.07	$0.00	$42.20
3 / 70.00		$34.43	$10.08	$11.62	$7.60	$0.00	$63.73
4 / 80.00		$39.35	$10.08	$11.62	$10.14	$0.00	$71.19
Apprentice to Journeyworker Ratio: 1:5							
PIPELAYER	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
LABORERS	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
PIPELAYER (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
PLUMBER & PIPEFITTER	9/17/2025	$52.26	$12.00	$10.85	$7.10	$0.00	$82.21
PLUMBERS & PIPEFITTERS LOCAL 104 PLUMBERS & PIPEFITTERS LOCAL 104	3/17/2026	$54.26	$12.00	$10.85	$7.10	$0.00	$84.21
	9/17/2026	$56.26	$12.00	$10.85	$7.10	$0.00	$86.21
	3/17/2027	$58.26	$12.00	$10.85	$7.10	$0.00	$88.21
	9/17/2027	$60.26	$12.00	$10.85	$7.10	$0.00	$90.21
	3/17/2028	$62.26	$12.00	$10.85	$7.10	$0.00	$92.21
	9/17/2028	$64.26	$12.00	$10.85	$7.10	$0.00	$94.21
	3/17/2029	$66.26	$12.00	$10.85	$7.10	$0.00	$96.21

Apprentice: PLUMBER & PIPEFITTER

Effective Date: 9/17/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$23.52	$12.00	$10.85	$0.00	$0.00	$46.37
2	50.00	$26.13	$12.00	$10.85	$0.00	$0.00	$48.98
3	55.00	$28.74	$12.00	$10.85	$0.00	$0.00	$51.59
4	60.00	$31.36	$12.00	$10.85	$0.00	$0.00	$54.21
5	65.00	$33.97	$12.00	$10.85	$0.00	$0.00	$56.82
6	70.00	$36.58	$12.00	$10.85	$0.00	$0.00	$59.43
7	75.00	$39.20	$12.00	$10.85	$0.00	$0.00	$62.05
8	80.00	$41.81	$12.00	$10.85	$0.00	$0.00	$64.66
9	85.00	$44.42	$12.00	$10.85	$7.10	$0.00	$74.37
10	85.00	$44.42	$12.00	$10.85	$7.10	$0.00	$74.37

Apprentice: PLUMBER & PIPEFITTER

Effective Date: 3/17/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$24.42	$12.00	$10.85	$0.00	$0.00	$47.27
2	50.00	$27.13	$12.00	$10.85	$0.00	$0.00	$49.98
3	55.00	$29.84	$12.00	$10.85	$0.00	$0.00	$52.69
4	60.00	$32.56	$12.00	$10.85	$0.00	$0.00	$55.41
5	65.00	$35.27	$12.00	$10.85	$0.00	$0.00	$58.12
6	70.00	$37.98	$12.00	$10.85	$0.00	$0.00	$60.83
7	75.00	$40.70	$12.00	$10.85	$0.00	$0.00	$63.55
8	80.00	$43.41	$12.00	$10.85	$0.00	$0.00	$66.26

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PLUMBER & PIPEFITTER

Effective Date: 3/17/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
9	85.00	$46.12	$12.00	$10.85	$7.10	$0.00	$76.07
10	85.00	$46.12	$12.00	$10.85	$7.10	$0.00	$76.07

Apprentice Notes

**1:1,2:5,3:9,4:12

Apprentice to Journeyworker Ratio: 1:1

PNEUMATIC CONTROLS (TEMP.) PLUMBERS & PIPEFITTERS LOCAL 104 PLUMBERS & PIPEFITTERS LOCAL 104	9/17/2025	$52.26	$12.00	$10.85	$7.10	$0.00	$82.21
	3/17/2026	$54.26	$12.00	$10.85	$7.10	$0.00	$84.21
	9/17/2026	$56.26	$12.00	$10.85	$7.10	$0.00	$86.21
	3/17/2027	$58.26	$12.00	$10.85	$7.10	$0.00	$88.21
	9/17/2027	$60.26	$12.00	$10.85	$7.10	$0.00	$90.21
	3/17/2028	$62.26	$12.00	$10.85	$7.10	$0.00	$92.21
	9/17/2028	$64.26	$12.00	$10.85	$7.10	$0.00	$94.21
	3/17/2029	$66.26	$12.00	$10.85	$7.10	$0.00	$96.21
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWDERMAN & BLASTER LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.75	$10.15	$9.50	$8.57	$0.00	$65.97
	6/1/2026	$39.05	$10.15	$9.50	$8.57	$0.00	$67.27
	12/7/2026	$40.35	$10.15	$9.50	$8.57	$0.00	$68.57
	6/7/2027	$41.75	$10.15	$9.50	$8.57	$0.00	$69.97
	12/6/2027	$43.15	$10.15	$9.50	$8.57	$0.00	$71.37
	6/5/2028	$44.65	$10.15	$9.50	$8.57	$0.00	$72.87
	12/4/2028	$46.15	$10.15	$9.50	$8.57	$0.00	$74.37
For apprentice rates see "Apprentice- LABORER"							
POWDERMAN & BLASTER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/1/2025	$37.74	$10.15	$9.50	$6.56	$0.00	$63.95
	6/1/2026	$39.04	$10.15	$9.50	$6.56	$0.00	$65.25
	12/1/2026	$40.33	$10.15	$9.50	$6.56	$0.00	$66.54
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.56	$13.78	$12.15	$3.00	$0.00	$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (DEWATERING, OTHER) OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.03	$13.78	$12.15	$3.00	$0.00	$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
READY-MIX CONCRETE DRIVER TEAMSTERS 404 - Construction Service (Northampton) TEAMSTERS 404 - Construction Service (Northampton)	5/1/2024	$26.14	$11.82	$7.25	$0.00	$0.00	$45.21
RIDE-ON MOTORIZED BUGGY OPERATOR LABORERS LABORERS - ZONE 3 (BUILDING & SITE)	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							
ROLLER OPERATOR OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$38.42	$13.78	$12.15	$3.00	$0.00	$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
ROOFER (Coal tar pitch) ROOFERS LOCAL 248 ROOFERS LOCAL 248	10/2/2025	$44.73	$10.60	$8.70	$10.00	$0.00	$74.03
	7/16/2026	$46.73	$10.60	$8.70	$10.00	$0.00	$76.03
For apprentice rates see "Apprentice- ROOFER"							
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) ROOFERS LOCAL 248 ROOFERS LOCAL 248	10/2/2025	$44.23	$10.60	$8.70	$10.00	$0.00	$73.53
	7/16/2026	$46.23	$10.60	$8.70	$10.00	$0.00	$75.53
ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 248 ROOFERS LOCAL 248	10/2/2025	$44.73	$10.60	$8.70	$10.00	$0.00	$74.03
	7/16/2026	$46.73	$10.60	$8.70	$10.00	$0.00	$76.03
For apprentice rates see "Apprentice- ROOFER"							
SCRAPER OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$39.03	$13.78	$12.15	$3.00	$0.00	$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$38.42	$13.78	$12.15	$3.00	$0.00	$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
SELF-PROPELLED POWER BROOM OPERATING ENGINEERS LOCAL 98 OPERATING ENGINEERS LOCAL 98	12/1/2023	$35.80	$13.78	$12.15	$3.00	$0.00	$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 63 SHEETMETAL WORKERS LOCAL 63	7/1/2025	$43.48	$12.94	$11.01	$8.72	$2.13	$78.28
	7/1/2026	$43.48	$13.24	$11.01	$9.92	$2.13	$79.78
	1/1/2027	$43.48	$13.54	$11.01	$11.12	$2.13	$81.28
	7/1/2027	$44.98	$13.54	$11.01	$11.12	$2.13	$82.78
	1/1/2028	$46.48	$13.54	$11.01	$11.12	$2.13	$84.28

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: SHEETMETAL WORKER

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$19.57	$5.82	$4.95	$0.00	$0.85	$31.19
2	50.00	$21.74	$6.47	$5.51	$0.00	$0.94	$34.66
3	55.00	$23.91	$7.12	$9.91	$0.00	$1.15	$42.09
4	60.00	$26.09	$7.76	$9.91	$0.00	$1.23	$44.99
5	65.00	$28.26	$8.41	$9.91	$0.00	$1.31	$47.89
6	70.00	$30.44	$9.06	$9.91	$0.00	$1.39	$50.80
7	75.00	$32.61	$9.71	$9.91	$0.00	$1.47	$53.70
8	80.00	$34.78	$10.35	$9.91	$8.72	$1.78	$65.54
9	85.00	$36.96	$11.00	$9.91	$8.72	$1.86	$68.45
10	90.00	$39.13	$11.65	$9.91	$8.72	$1.94	$71.35

Apprentice: SHEETMETAL WORKER

Effective Date: 7/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$19.57	$5.96	$4.95	$0.00	$0.85	$31.33
2	50.00	$21.74	$6.62	$5.51	$0.00	$0.94	$34.81
3	55.00	$23.91	$7.28	$9.91	$0.00	$1.15	$42.25
4	60.00	$26.09	$7.94	$9.91	$0.00	$1.23	$45.17
5	65.00	$28.26	$8.60	$9.91	$0.00	$1.31	$48.08
6	70.00	$30.44	$9.27	$9.91	$0.00	$1.39	$51.01
7	75.00	$32.61	$9.93	$9.91	$0.00	$1.47	$53.92
8	80.00	$34.78	$10.59	$9.91	$9.92	$1.78	$66.98
9	85.00	$36.96	$11.25	$9.91	$9.92	$1.86	$69.90
10	90.00	$39.13	$11.92	$9.91	$9.92	$1.94	$72.82

Apprentice to Journeyworker Ratio: 1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/1/2025	$41.24	$15.57	$21.78	$0.00	$0.00	$78.59
	1/1/2026	$41.24	$16.17	$21.78	$0.00	$0.00	$79.19
	6/1/2026	$42.24	$16.17	$21.78	$0.00	$0.00	$80.19
	12/1/2026	$42.24	$16.17	$23.52	$0.00	$0.00	$81.93
	1/1/2027	$42.24	$16.77	$23.52	$0.00	$0.00	$82.53
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/1/2025	$41.53	$15.57	$21.78	$0.00	$0.00	$78.88
	1/1/2026	$41.53	$16.17	$21.78	$0.00	$0.00	$79.48
	6/1/2026	$42.53	$16.17	$21.78	$0.00	$0.00	$80.48
	12/1/2026	$42.53	$16.17	$23.52	$0.00	$0.00	$82.22
	1/1/2027	$42.53	$16.77	$23.52	$0.00	$0.00	$82.82
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 669 SPRINKLER FITTERS LOCAL 669	10/1/2025	$53.25	$12.40	$7.40	$9.41	$0.00	$82.46
	1/1/2026	$53.25	$13.60	$7.45	$9.41	$0.00	$83.71
	4/1/2026	$56.54	$13.60	$7.45	$9.41	$0.00	$87.00

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	7/1/2026	$56.54	$13.60	$7.45	$9.41	$0.00	$87.00
	10/1/2026	$56.54	$13.60	$7.45	$9.41	$0.00	$87.00
	1/1/2027	$56.54	$14.55	$7.50	$9.41	$0.00	$88.00
	4/1/2027	$59.83	$14.55	$7.50	$9.41	$0.00	$91.29
	7/1/2027	$59.83	$14.55	$7.50	$9.41	$0.00	$91.29
	10/1/2027	$59.83	$14.55	$7.50	$9.41	$0.00	$91.29
	1/1/2028	$59.83	$15.50	$7.55	$9.41	$0.00	$92.29

Apprentice: SPRINKLER FITTER

Effective Date: 10/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	43.00	$26.94	$12.40	$0.00	$0.00	$0.00	$39.34
2	48.00	$30.08	$12.40	$0.00	$0.00	$0.00	$42.48
3	52.00	$32.58	$12.40	$7.40	$1.15	$0.00	$53.53
4	56.00	$35.09	$12.40	$7.40	$1.15	$0.00	$56.04
5	59.00	$36.97	$12.40	$7.40	$1.40	$0.00	$58.17
6	64.00	$40.10	$12.40	$7.40	$1.40	$0.00	$61.30
7	68.00	$42.61	$12.40	$7.40	$1.40	$0.00	$63.81
8	72.00	$45.12	$12.40	$7.40	$1.40	$0.00	$66.32
9	76.00	$47.62	$12.40	$7.40	$1.40	$0.00	$68.82
10	80.00	$50.13	$12.40	$7.40	$1.40	$0.00	$71.33

Apprentice: SPRINKLER FITTER

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	43.00	$26.94	$9.64	$0.00	$0.00	$0.00	$36.58
2	48.00	$30.08	$9.64	$0.00	$0.00	$0.00	$39.72
3	52.00	$32.58	$13.60	$7.45	$1.15	$0.00	$54.78
4	56.00	$35.09	$13.60	$7.45	$1.15	$0.00	$57.29
5	59.00	$36.97	$13.60	$7.45	$1.40	$0.00	$59.42
6	64.00	$40.10	$13.60	$7.45	$1.40	$0.00	$62.55
7	68.00	$42.61	$13.60	$7.45	$1.40	$0.00	$65.06
8	72.00	$45.12	$13.60	$7.45	$1.40	$0.00	$67.57
9	76.00	$47.62	$13.60	$7.45	$1.40	$0.00	$70.07
10	80.00	$50.13	$13.60	$7.45	$1.40	$0.00	$72.58

Apprentice to Journeyworker Ratio: 1:1

TELECOMMUNICATION TECHNICIAN	6/29/2025	$52.16	$13.50	$8.31	$6.90	$0.00	$80.87
TELECOMMUNICATION TECHNICIAN	12/28/2025	$53.26	$13.75	$8.40	$6.96	$0.00	$82.37
ELECTRICIANS LOCAL 7	6/28/2026	$54.41	$14.00	$8.43	$7.03	$0.00	$83.87
ELECTRICIANS LOCAL 7	1/3/2027	$55.56	$14.25	$8.47	$7.09	$0.00	$85.37

For apprentice rates and ratios see "Apprentice- ELECTRICIAN"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 6/29/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$20.86	$7.50	$0.63	$0.00	$0.00	$28.99
2	45.00	$23.47	$7.50	$0.70	$0.00	$0.00	$31.67
3	50.00	$26.08	$13.50	$7.53	$0.00	$0.00	$47.11
4	55.00	$28.69	$13.50	$7.61	$0.00	$0.00	$49.80
5	65.00	$33.90	$13.50	$9.84	$0.00	$0.00	$57.24
6	70.00	$36.51	$13.50	$11.30	$0.00	$0.00	$61.31

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 12/28/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$21.30	$7.65	$0.63	$0.00	$0.00	$29.58
2	45.00	$23.97	$7.65	$0.70	$0.00	$0.00	$32.32
3	50.00	$26.63	$13.75	$7.53	$0.00	$0.00	$47.91
4	55.00	$29.29	$13.75	$7.61	$0.00	$0.00	$50.65
5	65.00	$34.62	$13.75	$9.84	$0.00	$0.00	$58.21
6	70.00	$37.28	$13.75	$11.30	$0.00	$0.00	$62.33

Apprentice to Journeyworker Ratio: 1:1

TERRAZZO FINISHERS	8/1/2025	$66.89	$11.49	$15.57	$8.02	$0.00	$101.97
BRICKLAYERS LOCAL 3	2/10/2026	$68.24	$11.49	$15.57	$8.02	$0.00	$103.32
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	8/1/2026	$70.44	$11.49	$15.57	$8.02	$0.00	$105.52
	2/1/2027	$71.84	$11.49	$15.57	$8.02	$0.00	$106.92

Apprentice: TERRAZZO FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.45	$11.49	$15.57	$8.02	$0.00	$68.53
2	60.00	$40.13	$11.49	$15.57	$8.02	$0.00	$75.21
3	70.00	$46.82	$11.49	$15.57	$8.02	$0.00	$81.90
4	80.00	$53.51	$11.49	$15.57	$8.02	$0.00	$88.59
5	90.00	$60.20	$11.49	$15.57	$8.02	$0.00	$95.28

Apprentice: TERRAZZO FINISHERS

Effective Date: 2/10/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.12	$11.49	$15.57	$8.02	$0.00	$69.20

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: TERRAZZO FINISHERS

Effective Date: 2/10/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	60.00	$40.94	$11.49	$15.57	$8.02	$0.00	$76.02
3	70.00	$47.77	$11.49	$15.57	$8.02	$0.00	$82.85
4	80.00	$54.59	$11.49	$15.57	$8.02	$0.00	$89.67
5	90.00	$61.42	$11.49	$15.57	$8.02	$0.00	$96.50

Apprentice to Journeyworker Ratio: 1:5

TERRAZZO MECHANIC BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	8/1/2025	$67.97	$11.49	$15.57	$7.99	$0.00	$103.02
	2/1/2026	$69.32	$11.49	$15.57	$7.99	$0.00	$104.37
	8/1/2026	$71.52	$11.49	$15.57	$7.99	$0.00	$106.57
	2/1/2027	$72.92	$11.49	$15.57	$7.99	$0.00	$107.97

Apprentice: TERRAZZO MECHANIC

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.99	$11.49	$15.57	$7.99	$0.00	$69.04
2	60.00	$40.78	$11.49	$15.57	$7.99	$0.00	$75.83
3	70.00	$47.58	$11.49	$15.57	$7.99	$0.00	$82.63
4	80.00	$54.38	$11.49	$15.57	$7.99	$0.00	$89.43
5	90.00	$61.17	$11.49	$15.57	$7.99	$0.00	$96.22

Apprentice: TERRAZZO MECHANIC

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.66	$11.49	$15.57	$7.99	$0.00	$69.71
2	60.00	$41.59	$11.49	$15.57	$7.99	$0.00	$76.64
3	70.00	$48.52	$11.49	$15.57	$7.99	$0.00	$83.57
4	80.00	$55.46	$11.49	$15.57	$7.99	$0.00	$90.51
5	90.00	$62.39	$11.49	$15.57	$7.99	$0.00	$97.44

Apprentice to Journeyworker Ratio: 1:5

TEST BORING DRILLER LABORERS LABORERS - FOUNDATION AND MARINE	12/1/2025	$52.70	$10.15	$9.50	$9.80	$0.00	$82.15
	6/1/2026	$54.25	$10.15	$9.50	$9.80	$0.00	$83.70
	12/1/2026	$55.75	$10.15	$9.50	$9.80	$0.00	$85.20

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER LABORERS LABORERS - FOUNDATION AND MARINE	12/1/2025	$48.82	$10.15	$9.50	$9.80	$0.00	$78.27
	6/1/2026	$50.37	$10.15	$9.50	$9.80	$0.00	$79.82
	12/1/2026	$51.87	$10.15	$9.50	$9.80	$0.00	$81.32

For apprentice rates see "Apprentice- LABORER"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
TEST BORING LABORER	12/1/2025	$48.70	$10.15	$9.50	$9.80	$0.00	$78.15
LABORERS	6/1/2026	$50.25	$10.15	$9.50	$9.80	$0.00	$79.70
LABORERS - FOUNDATION AND MARINE	12/1/2026	$51.75	$10.15	$9.50	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
TRACTORS	12/1/2023	$38.42	$13.78	$12.15	$3.00	$0.00	$67.35
OPERATING ENGINEERS LOCAL 98							
OPERATING ENGINEERS LOCAL 98							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT	12/1/2025	$41.82	$15.57	$21.78	$0.00	$0.00	$79.17
TEAMSTERS JOINT COUNCIL NO. 10	1/1/2026	$41.82	$16.17	$21.78	$0.00	$0.00	$79.77
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.82	$16.17	$21.78	$0.00	$0.00	$80.77
	12/1/2026	$42.82	$16.17	$23.52	$0.00	$0.00	$82.51
	1/1/2027	$42.82	$16.77	$23.52	$0.00	$0.00	$83.11
TUNNEL WORK - COMPRESSED AIR	12/1/2025	$60.93	$10.15	$9.50	$10.25	$0.00	$90.83
LABORERS	6/1/2026	$62.48	$10.15	$9.50	$10.25	$0.00	$92.38
LABORERS (COMPRESSED AIR)	12/1/2026	$63.98	$10.15	$9.50	$10.25	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	12/1/2025	$62.93	$10.15	$9.50	$10.25	$0.00	$92.83
LABORERS	6/1/2026	$64.48	$10.15	$9.50	$10.25	$0.00	$94.38
LABORERS (COMPRESSED AIR)	12/1/2026	$65.98	$10.15	$9.50	$10.25	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR	12/1/2025	$53.00	$10.15	$9.50	$10.25	$0.00	$82.90
LABORERS	6/1/2026	$54.55	$10.15	$9.50	$10.25	$0.00	$84.45
LABORERS (FREE AIR TUNNEL)	12/1/2026	$56.05	$10.15	$9.50	$10.25	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE)	12/1/2025	$55.00	$10.15	$9.50	$10.25	$0.00	$84.90
LABORERS	6/1/2026	$56.55	$10.15	$9.50	$10.25	$0.00	$86.45
LABORERS (FREE AIR TUNNEL)	12/1/2026	$58.05	$10.15	$9.50	$10.25	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL	12/1/2025	$41.24	$15.57	$21.78	$0.00	$0.00	$78.59
TEAMSTERS JOINT COUNCIL NO. 10	1/1/2026	$41.24	$16.17	$21.78	$0.00	$0.00	$79.19
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.24	$16.17	$21.78	$0.00	$0.00	$80.19
	12/1/2026	$42.24	$16.17	$23.52	$0.00	$0.00	$81.93
	1/1/2027	$42.24	$16.77	$23.52	$0.00	$0.00	$82.53
WAGON DRILL OPERATOR	12/1/2025	$37.00	$10.15	$9.50	$8.57	$0.00	$65.22
LABORERS	6/1/2026	$38.30	$10.15	$9.50	$8.57	$0.00	$66.52
LABORERS - ZONE 3 (BUILDING & SITE)	12/7/2026	$39.60	$10.15	$9.50	$8.57	$0.00	$67.82
	6/7/2027	$41.00	$10.15	$9.50	$8.57	$0.00	$69.22
	12/6/2027	$42.40	$10.15	$9.50	$8.57	$0.00	$70.62
	6/5/2028	$43.90	$10.15	$9.50	$8.57	$0.00	$72.12
	12/4/2028	$45.40	$10.15	$9.50	$8.57	$0.00	$73.62
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	12/1/2025	$36.99	$10.15	$9.50	$6.56	$0.00	$63.20
LABORERS LABORERS - ZONE 3 (HEAVY & HIGHWAY)	6/1/2026	$38.29	$10.15	$9.50	$6.56	$0.00	$64.50
	12/1/2026	$39.58	$10.15	$9.50	$6.56	$0.00	$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

WATER METER INSTALLER	9/17/2025	$52.26	$12.00	$10.85	$7.10	$0.00	$82.21
PLUMBERS & PIPEFITTERS LOCAL 104 PLUMBERS & PIPEFITTERS LOCAL 104	3/17/2026	$54.26	$12.00	$10.85	$7.10	$0.00	$84.21
	9/17/2026	$56.26	$12.00	$10.85	$7.10	$0.00	$86.21
	3/17/2027	$58.26	$12.00	$10.85	$7.10	$0.00	$88.21
	9/17/2027	$60.26	$12.00	$10.85	$7.10	$0.00	$90.21
	3/17/2028	$62.26	$12.00	$10.85	$7.10	$0.00	$92.21
	9/17/2028	$64.26	$12.00	$10.85	$7.10	$0.00	$94.21
	3/17/2029	$66.26	$12.00	$10.85	$7.10	$0.00	$96.21

For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"

Outside Electrical

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
EQUIPMENT OPERATOR OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 For apprentice rates see "Apprentice- LINEMAN"	9/1/2019	$44.67	$8.00	$12.55	$0.00	$0.00	$65.22
GROUNDMAN OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 For apprentice rates see "Apprentice- LINEMAN"	9/1/2019	$30.58	$8.00	$5.48	$0.00	$0.00	$44.06
GROUNDMAN / TRUCK DRIVER OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 For apprentice rates see "Apprentice- LINEMAN"	9/1/2019	$39.97	$8.00	$10.96	$0.00	$0.00	$58.93
HEAVY EQUIPMENT OPERATOR OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 For apprentice rates see "Apprentice- LINEMAN"	9/1/2019	$47.01	$8.00	$13.22	$0.00	$0.00	$68.23
JOURNEYMAN LINEMAN OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42	9/1/2019	$51.71	$8.00	$15.55	$0.00	$0.00	$75.26

Apprentice: JOURNEYMAN LINEMAN

Effective Date: 9/1/2019

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$31.03	$8.00	$3.43	$0.00	$0.00	$42.46
2	65.00	$33.61	$8.00	$3.51	$0.00	$0.00	$45.12
3	70.00	$36.20	$8.00	$3.59	$0.00	$0.00	$47.79
4	75.00	$38.78	$8.00	$5.16	$0.00	$0.00	$51.94
5	80.00	$41.37	$8.00	$5.24	$0.00	$0.00	$54.61
6	85.00	$43.95	$8.00	$5.32	$0.00	$0.00	$57.27
7	90.00	$46.54	$8.00	$7.40	$0.00	$0.00	$61.94

Apprentice to Journeyworker Ratio: 1:2

TELEDATA CABLE SPLICER OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42	2/4/2019	$30.73	$4.70	$0.92	$2.25	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42	2/4/2019	$28.93	$4.70	$0.89	$2.25	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42 OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42	2/4/2019	$28.93	$4.70	$0.89	$2.25	$0.00	$36.77
TRACTOR-TRAILER DRIVER OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42	9/1/2019	$44.67	$8.00	$12.55	$0.00	$0.00	$65.22

Outside Electrical

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42							

Additional Apprentice Information

All apprentices must be registered with the Division of Apprenticeship Training(DAS) in accordance with M.G.L.c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L.c. 149, §§ 26-27D.

Apprentice ratios are established by DAS pursuant to M.G.L.c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements(CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate.

Parties having questions regarding what ratio to use should contact DAS.

DOCUMENT 00870

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS
(EXECUTIVE ORDER 11246)
Revised April 9, 2019

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:

   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

   d. "Minority" includes:

      (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $ 10,000 the provisions of the specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

   f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

   g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

   h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11 The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as many be required by the Government and keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

APPENDIX A

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of $ 10,000. The goals are applicable to the Contractor's aggregate on-site construction workforce whether or not part of that workforce is performing work on a Federal or federally-assisted construction contract or subcontract.

Area covered: Goal for Women apply nationwide

Goals and Timetables

Timetable	Goals (percent)
From Apr. 1, 1980 until further notice	6.9

APPENDIX B-80

Until further notice, the following goals for minority utilization in each construction craft and trade shall included in all Federal or federally assisted construction contracts and subcontracts in excess of $ 10,000 to be performed in the respective geographical areas. The goals are applicable to each nonexempt contractor's total on- site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally assisted or nonfederally related project, contract or subcontract.

Construction contractors participating in an approved Hometown Plan (see 41 CFR 6-4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply with the applicable SMSA or EA goal contained in this Appendix B-80.

Economic Areas

STATE:	Goals (percent)
MASSACHUSETTS	
004 Boston MA: SMSA Counties: 1123 Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	4.0
MA Essex, MA Middlesex, MA Norfolk, MA Plymouth, MA Suffolk, NH Rockingham.	
5403 Fall River- New Bedford MA, Bristol	1.6
9243 Worcester-Fitchburg-Leominster, MA	1.6
6323 Springfield-Chicopee-Holyoke MA-CT MA Hampden, MA Hampshire	4.8
Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket	3.6
Non-SMSA Counties: MA Franklin	5.9

APPENDIX C

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontractors, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Massachusetts Department of Transportation (MassDOT) or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to MassDOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, MassDOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a control, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as MassDOT or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request MassDOT to enter into any litigation to protect the interests of MassDOT. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX D

During the performance of this contact, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor," which includes consultants) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

PERTINENT NON-DISCRIMINATION AUTHORITIES:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-Aid programs and projects)

- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 *et seq.*) (prohibits discrimination on the basis of sex)

- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability) and 49 CFR Part 27

- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 *et seq.*) (prohibits discrimination on the basis of age)

- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex)

- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of Federal-Aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not)

- Titles II and III of the Americans with Disabilities Act (42 U.S.C. §§ 12131-12189), as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38 (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities)

- The Federal Aviation Administration's Non-Discrimination Statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex)

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations)

- Executive Order 13166, Improving Access to Services for People with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100)

- Title IX of the Education Amendments Act of 1972, as amended (20 U.S.C. 1681 *et seq.*) (prohibits discrimination on the basis of sex in education programs or activities)

*** END OF DOCUMENT ***

DOCUMENT 00880

Revised January 12, 2022

DEPARTMENT OF LABOR

Employment Standards Administration

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONTRACTS

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General Decision Number: MA20260019 01/02/2026

Superseded General Decision Number: MA20250019

State: Massachusetts

Construction Type: Highway

County: Hampden County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/02/2026

ENGI0004-019 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 57.83	33.70
Group 2	$ 57.18	33.70

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:
A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS
Group 1: Broom/Sweeper; Crane; Gradall; Post Driver (Guardrail/Fences)
Group 2: Bulldozer; Grader/Blade

ENGI0098-010 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 42.88	31.04+A
Group 2	$ 42.57	31.04+A
Group 4	$ 39.12	31.04+A

Footnote:
A. Paid Holidays: New year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS
Group 1: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid Loader; Loader
Group 2: Milling Machine; Paver (Asphalt, Aggregate, and Concrete)
Group 4: Roller

IRON0007-027 09/16/2025

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND STRUCTURAL)	$ 41.89	33.90

LABO0596-006 06/01/2025

	Rates	Fringes
LABORER (Traffic Control: Flagger)	$ 35.00	26.91

LABO0999-002 06/01/2025

	Rates	Fringes
LABORER (Common or General)	$ 35.00	26.91

PAIN0035-023 07/01/2024

	Rates	Fringes
PAINTER (Steel)	$ 56.76	36.00

SUMA2014-009 01/11/2017

	Rates	Fringes
CARPENTER, Includes Form Work	$ 33.03	20.02
CEMENT MASON/CONCRETE FINISHER	$ 52.13	20.89
ELECTRICIAN	$ 47.13	13.41
IRONWORKER, REINFORCING	$ 46.21	21.27

LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 33.10	18.09
LABORER: Concrete Saw (Hand Held/Walk Behind)	$ 44.43	14.18
LABORER: Landscape	$ 44.11	18.85
OPERATOR: Forklift	$ 51.63	0.00
OPERATOR: Mechanic	$ 48.14	17.02
OPERATOR: Piledriver	$ 43.87	18.04
PAINTER: Spray (Linestriping)	$ 38.30	17.43
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper	$ 43.73	15.06
TRUCK DRIVER: Concrete Truck	$ 33.69	15.79
TRUCK DRIVER: Dump Truck	$ 43.81	5.39
TRUCK DRIVER: Flatbed Truck	$ 48.53	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION

DOCUMENT A00801

SPECIAL PROVISIONS

SPRINGFIELD
Federal Aid Project No. HIP(NGB)-003S(924)
Bridge Replacement, S-24-016, Armory Street over CSX Mainline
& S-24-026, Armory Street over Abandoned CSX

Labor participation goals for this Project shall be 15.3% for minorities and 6.9% for women for each job category. The goals are applicable to both Contractor's and Subcontractor's on-site construction workforce. Refer to Document 00820 for details.

SCOPE OF WORK

The Project includes the complete superstructure and substructure replacement for Bridge No. S-24-016, Armory Street over New York Lines Railroad (CSX), and Bridge No. S-24-026, Armory Street over Abandoned Railroad with portions of the existing granite substructure to remain.

The Project also includes the reconstruction and widening of Armory Street between and including the intersections at Genessee Street/Warwick Street and Taylor Street which involves the construction of pile-supported retaining walls on both sides of the street, reinforced concrete moment slabs and bridge rail on both sides of the street, a Shared Use Path, replacement of a traffic signal system at Albany Street and alterations to the traffic signal systems at Genessee Street/Warwick Street and at Taylor Street.

The Project also includes guardrail removals and new installations, chain link fence removals and new installations, full depth pavement, moment slab sidewalks, cement concrete sidewalks, street light resettings, pavement markings, signing, and establishing natural surfaces.

All work under this Contract shall be done in conformance with the *2025 Standard Specifications for Highways and Bridges, the Supplemental Specifications* contained in this book, the *Construction Standard Details* in effect as of June 2025, the *1990 Standard Drawings for Signs and Supports*, the 2015 *Overhead Signal Structure and Foundation Standard Drawings*, the *2009 Manual on Uniform Traffic Control Devices (MUTCD) with Revisions 1, 2, and 3 and the November 2022 Massachusetts Amendments to the MUTCD, the 1968 Standard Drawings for Traffic Signals and Highway Lighting*, the latest edition of The *American Standard for Nursery Stock*, the Plans and these Special Provisions.

CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 3:00 P.M. on the Tuesday of the previous week before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address massdotspecifications@dot.state.ma.us The MassDOT proposal number and municipality is to be placed in the subject line.

SUBSECTION 7.05 INSURANCE REQUIREMENTS

The insurance requirements set forth in this subsection are in addition to the requirements of the Standard Specifications.

7.05.B: Public Liability Insurance 1. and
7.05.B: Public Liability Insurance 2.

The Massachusetts Department of Transportation and applicable railroads shall be named as additional insureds.

7.05.B: Public Liability Insurance 3.

Railroad Protective Liability Insurance and Protective Property Damage Liability Insurance shall be obtained in the amount of $5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of $10,000,000 on behalf of CSX.

7.05.B: Public Liability Insurance 4.

Asbestos Liability Insurance shall be obtained for this project. The Contractor and the Massachusetts Department of Transportation shall be named as additional insureds.

BIDDERS LIST

Pursuant to the provisions of 49 CFR Part 26.11 all official bidders will be required to report the names, addresses and telephone numbers of all firms that submitted bids or quotes in connection with this project. Failure to comply with a written request for this information within 15 business days may result in a recommendation to the Prequalification Committee that prequalification status be suspended until the information is received.

The Department will survey all firms that have submitted bids or quotes during the previous year prior to setting the annual goal and shall request that each firm report its age and gross receipts for the year.

HOLIDAY WORK RESTRICTIONS

(Supplementing Subsection 7.09)

The District Highway Director (DHD) may authorize work to continue during these specified time periods if it is determined by the District that the work will not negatively impact the traveling public. DHD may allow work in those areas on a case by case basis and where work is behind barrier and will not impact traffic

Below are the holiday work restrictions:

New Years Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day. No work on local roadways on the holiday without permission by the DHD and the local police chief.

Martin Luther King's Birthday (Federal Holiday)
No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

President's Day (Federal Holiday)
No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

Evacuation Day (Suffolk County State Holiday)
No work restrictions due to traffic concerns.

Patriot's Day (State Holiday)
Work restrictions will be in place for Districts 3 and 6 along the entire Boston Marathon route and any other locations that the DHD in those districts determine are warranted so as to not to impact the marathon. All other districts work restrictions will be as per DHD.

Mother’s Day
No work on Western Turnpike and Metropolitan Highway System from 5:00 AM on the Friday before, until the normal start of business on the following day.

Memorial Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

Bunker Hill Day (Suffolk County State Holiday)
No work restrictions due to traffic concerns.

HOLIDAY WORK RESTRICTIONS (Continued)

Juneteenth
No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

Independence Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day. No work on local roadways on the holiday without permission by the DHD and the local police chief.

Labor Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

Columbus Day (Federal Holiday)
No work on major arterials from 5:00 AM on the Friday before, until the normal start of business on the following day

Veterans' Day (Federal Holiday)
No work restrictions due to traffic concerns.

Thanksgiving Day (Federal Holiday)
No work on major arterials from 5:00 AM two days before until the normal start of business on the following Monday.

Christmas Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day.

PUBLIC SAFETY AND CONVENIENCE

(Supplementing Subsection 7.09)

One-way traffic in the southbound direction on Armory Street is required. The Engineer will determine when one-way traffic shall be initiated. Once the one-way traffic configuration is implemented it shall remain in operation until authorized for removal by the Engineer. The one-way traffic configuration requires modifications to the existing traffic signals and the implementation of detours, both of which shall be completed before one-way traffic can be initiated. If necessary, temporary traffic control shall be directed by police, in coordination with MassDOT.

Closure of Albany Street to through vehicular and pedestrian travel to and from Armory Street and implementation of a detour is required throughout construction. Advance traffic management signs and devices for the closure and the detour shall be installed prior to the closure. The Engineer will determine when the closure will be initiated and removed. After the closure is implemented Albany Street shall remain closed until authorized by the engineer to be opened to through traffic.

Closure of Armory Street in both directions shall be allowed only when authorized by the Engineer during hours of lowest traffic volume at night under police control and after traffic control devices and detour signing for the southbounmd direction are installed. For all other periods when the detour in the southbound direction is not authorized the traffic control devices and detour signing for that direction shall be removed and/or covered. The Armory Street southbound detour as shown on the plans includes a restricted height overpass on Dwight Steet that will prevent use by some trucks. To account for this limitation a proposed signed truck route detour for the southbound direction is shown on the plans, originating from the Warwick Street/Genessee Street intersection and ending at the I-291 ramps.

The proposed temporary barrier on Armory Street is limited deflection and as such, is likely to require attachment to the existing roadway surface. The Contractor is alerted that the periodic removal and resetting of a limited amount of temporary barrier – limited deflection – for work site access and egress is the Contractor's responsibility at his own cost. The Contractor should anticipate installing a type of temporary barrier pavement attachment detail for the length of temporary barrier that will need to be periodically removed and reset that will meet the manufacturer's deflection criteria and that will also withstand the wear and tear of periodic removals and resetting. The location selected for work site access and egress must be coordinated with temporary lateral and vertical surface to subsurface utility alignment transitions that are necessary to install the micropiles.

Contractor access to the Stage 1 Armory Street work site behind the temporary barrier between the two bridges is anticipated to be facilitated by the proposed temporary closure of Albany Street. Contractor use of the Albany Street closed area enables the movement of equipment and material into the work site at as nearly a perpendicular orientation as possible to the alignment of the temporary barrier.

PIONEER VALLEY TRANSIT AUTHORITY (PVTA) COORDINATION

PVTA intends to participate in the pre-construction meeting and shall be alerted 14 days in advance of the meeting by the Contractor. In addition, PVTA requires notification one month in advance of traffic management changes that effect or change their bus routes.

SCHEDULE OF OPERATIONS

(Supplementing Subsection 8.02)

Some work may be required to be performed during off-peak hours (night work) during lower traffic volumes. The contract includes Item 853.8, Temporary Illumination for Work Zone, in support of this required night work. The Contractor shall account for additional costs of night work in his bid price, including the costs to increase the amount of night work at his option as described below. Required night work is anticipated to include (but not be limited to) the following: milling; casting adjustments (within travel way); partial drainage installations (crossing travel way); test pits; water main work within the intersections at Armory Street/Warwick Street/Genessee Street and at Armory Street/Taylor Street involving trenching, pipe installations, tie-over connections to existing pipe, testing and disinfection; conduit installations within the intersections at Armory Street/Warwick Street/Genessee Street and at Armory Street/Taylor Street; one-way traffic configuration setup and dismantling for each work stage; final paving and markings.

The contract does not impose limitations on the amount of night work that the Contractor is allowed, at his option and at his own expense, except as may be limited by train activity. Any night work shall be requested a week in advance of the work and will be allowed only if approved by the Engineer.

CSX has provided train activity information as of September 2024 as follows:

CSX operates six (6) day trains, ten (10) night trains, and six (6) switching trains daily through the work zone at speeds up to 60 mph. CSX records show that Amtrak and New England Central Railroad also operate at this location (frequency and schedule not provided).

Bridge demolition and construction should be planned while maintaining the noted frequency of trains. The Contractor shall host regular coordination meetings with railroad operators throughout contract duration to coordinate work limits and activity approvals.The Contractor shall anticipate delays and inefficiencies resulting from working in and around the CSX railroad. Any lost production resulting from coordination with the railroads shall not be measured or paid for separately.

The Contractor shall submit procedures for setup and securement of equipment such as drill rigs and cranes with potential to foul tracks that will include predefined precautions such as including swing-limiting controls, oversizing matting and dunnage for supporting equipment, etc.

The Contractor shall protect adjacent CSX Railroad tracks from damage associated with micropile construction and other related operations. Damage due to micropile installation or other construction activities shall be repaired immediately by the Contractor at its own expense.

PROSECUTION OF THE WORK

(Supplementing Subsection 8.03)

The Contractor is hereby notified that winter work is expected for this project and has been taken into account in setting the completion date of the contract. If the work to be performed during the winter includes concrete or mortar, the relevant provisions of Subsection 901.72 shall be followed. Any costs, either direct costs or those resulting from inefficiencies, related to continuing work in the winter shall be included in the Contractor's bid and shall not be cause for a claim for a time extension or additional compensation.

Contractual Completion Milestones:

This contract contains the following contractual milestones that are to be included in the Contractor's Baseline Contract Progress Schedule submission. The Contractor shall identify the completion of the work pertaining to each contractual milestone through the conclusion of a finish milestone in the accepted baseline Contract Progress Schedule.

MS #03 – Full Beneficial Use – The majority of contract Work has been completed, and the asset(s) has been opened for full multi-modal transportation use, except for limited contract work items that do not materially impair or hinder the intended public use of the transportation facility. All anticipated lane takings have been completed, except for minor, short-term work items.

The Contractor shall achieve Full Beneficial Use within 2,044 calendar days from Notice to Proceed.

MS #02 – Substantial Completion – A walkthrough of the entire contract Work has been performed by the Resident Engineer. A punch list has been generated and the Work required by contract, including paperwork, has been completed except for work having a contract price of less than one percent of the adjusted total contract price, including overruns underruns and all contract amendments. All material submittals have been received by the District Materials Lab.

The Contractor shall achieve Substantial Completion within 2,071 calendar days from Notice to Proceed.

MS #01 – Contractor Field Completion – Contractor Field Completion shall be defined as the date of completion of all physical contract work, including the punch list, and the Contractor has fully de-mobilized from the field operations.

The Contractor shall achieve Contractor Field Completion within 2,116 calendar days from Notice to Proceed.

LIMITATIONS OF OPERATIONS

(Supplementing Subsection 8.06)

The contract time (duration) has considered work and restrictions by Third Parties (such as utilities and railroads) and has been developed with the initial information provided by the Third Parties, and accepted by MassDOT. The Contractor shall communicate and coordinate with all affected Third Parties, and may be required to perform support aspects of the third party scope (as noted in the Contract Documents) well in advance of the start of the applicable third party scope. The Contractor must clearly identify all aspects of this work in the preparation of the construction schedule and throughout the contract duration.

In accordance with the requirements provided in Subsection 8.02, the Contractor shall provide a project baseline schedule, in accordance with the terms and conditions of the contract that identifies all affected Third Parties. During the prosecution of work, and as part of the Monthly Schedule Update submission, the Contractor shall provide proof of notification to those Third Parties.

If, during the prosection of the work, the Contractor is delayed by a Third Party, the Contractor shall identfy delays, as identified with the most recent schedule update, provide proper notification to the Engineer, evaluate options to recover, and present to the Engineer for approval. Should the Contractor's critical path be significantly impacted by the actions of the Third Party and no viable recovery options are accepted by MassDOT, the Contractor may submit a request for Time Extension accompanied by a complete Time Entitlement Analysis to clearly demonstrate the impact of the delay. Only after all of the schedule requirements have been met (see Subsections 8.02 and 8.10) and it is clear that the Contractor demonstrates that it has coordinated properly and worked expeditiously with the Third Party and that none of the Contractor's actions contributed to the delay will the Engineer approve a Time Extension Request. Under no circumstances will compensation be provided for delays associated with a Third Party.

SUBSECTION 8.14 UTILITY COORDINATION, DOCUMENTATION, AND MONITORING RESPONSIBILITIES

A. GENERAL

In accordance with the provisions of Section 8.00 Prosecution and Progress, utility coordination is a critical aspect to this Contract. This section defines the responsibility of the Contractor and MassDOT, with regard to the initial utility relocation plan and changes that occur as the prosecution of the Work progresses. The Engineer, with assistance from the Contractor shall coordinate with Utility companies that are impacted by the Contractor's operations. To support this effort, the Contractor shall provide routine and accurate schedule updates, provide notification of delays, and provide documentation of the steps taken to resolve any conflicts for the temporary and/or permanent relocations of the impacted utilities. The Contractor shall provide copies to the Engineer of the Contractor communication with the Utility companies, including but not limited to:

- Providing advanced notice, for all utility-related meetings initiated by the Contractor.
- Providing meeting minutes for all utility-related meetings that the Contractor attends.
- Providing all test pit records.
- Request for Early Utility work requirements of this section (see below).
- Notification letters for any proposed changes to Utility start dates and/or sequencing.
- Written notification to the Engineer of all apparent utility delays within seven (7) Calendar Days after a recognized delay to actual work in the field – either caused by a Utility or the Contractor.
- Any communication, initiated by the Contractor, associated with additional Right-of-Way needs in support of utility work.
- Submission of completed Utility Completion Forms.

B. PROJECT UTILITY COORDINATION (PUC) FORM

The utility schedule and sequence information provided in the Project Utility Coordination Form (if applicable) is the best available information at the time of the bid and has been considered in setting the contract duration. The Contractor shall use all of this information in developing the bid price and the Baseline Schedule Submission, inclusive of the individual utility durations sequencing requirements, and any work that has been noted as potentially concurrent utility installations.

C. INITIATION OF UTILITY WORK

The Engineer will issue all initial notice-to-proceed dates to each Utility company based on either the:

1) Contractor's accepted Baseline Schedule
2) An approved Early Utility Request in the form of an Early Utility sub-net schedule (in accordance with the requirements of this Subsection)
3) An approved Proposal Schedule

C.1 - BASELINE SCHEDULE – UTILITY BASIS

The Contractor shall provide a Baseline Schedule submission in accordance with the requirements of Subsection 8.02 and inclusive of all of the information provided in the PUC Form that has been issued in the Contract documents. This is to include the utility durations, sequencing of work, allowable concurrent work, and all applicable considerations that have been depicted on the PUC Form.

SUBSECTION 8.14 (Continued)

C.2 – EARLY UTILITY REQUEST – (aka SUBNET SCHEDULE) PRIOR TO THE BASELINE
All early utility work is defined as any anticipated/required utility relocations that need to occur prior to the Baseline Schedule acceptance. In all cases of proposed early utility relocation, the Contractor shall present all known information at the pre-construction conference in the form of a 'sub-net' schedule showing when each early utility activity needs to be issued a notice-to-proceed. The Contractor shall provide advance notification of this intent to request early utility work in writing at or prior to the Pre-Construction meeting. Prior to officially requesting approval for early utility work, the Contractor shall also coordinate with MassDOT and all utility companies (private, state or municipal) which may be impacted by the Contract. If this request is acceptable to the Utilities and to MassDOT, the Engineer will issue a notice-to-proceed to the affected Utilities, based on these accepted dates.

C.3 – PROPOSAL SCHEDULE - CHANGES TO THE PUC FORM
If the Contractor intends to submit a schedule (in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02) that contains durations or sequencing that vary from those provided in the Project Utility Coordination (PUC) Form, the Contactor must submit this as an intended change, in the form of a Proposal Schedule and in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02. These proposed changes are subject to the approval of the Engineer and the impacted utilities, in the form of this Proposal Schedule and a proposed revision to the PUC form. The Contractor shall not proceed with any changes of this type without written authorization from the Engineer, that references the approved Proposal Schedule and PUC form changes. The submission of the Baseline Schedule should not include any of these types of proposed utility changes and should not delay the submission of the Baseline Schedule. As a prerequisite to the Proposal Schedule submission, and in advance of the utility notification(s) period, the Contractor shall coordinate the proposed utility changes with the Engineer and the utility companies, to develop a mutually agreed upon schedule, prior to the start of construction.

D. UTILITY DELAYS
The Contractor shall notify the Engineer upon becoming aware that a Utility owner is not advancing the work in accordance with the approved utility schedule. Such notice shall be provided to the Engineer no later than seven (7) calendar days after the occurrence of the event that the Contractor believes to be a utility delay. After such notice, the Engineer and the Contractor shall continue to diligently seek the Utility Owner's cooperation in performing their scope of Work.

In order to demonstrate that a critical path delay has been caused by a third-party Utility, the Contractor must demonstrate, through the requirements of the monthly Progress Schedule submissions and the supporting contract records associated with Subsection 8.02, 8.10 and 8.14, that the delays were beyond the control of the Contractor.

SUBSECTION 8.14 (Continued)

All documentation provided in this section is subject to the review and verification of the Engineer and, if required, the Utility Owner. In accordance with MassDOT Specifications, Division I, Subsection 8.10, a Time Extension will be granted for a delay caused by a Utility, only if the actual duration of the utility work is in excess of that shown on the Project Utility Coordination Form, and only if;

1) proper Notification of Delay was provided to MassDOT in accordance with the time requirements that are specified in this Section
2) the utility delay is a critical path impact to the Baseline Schedule (or most recently approved Progress Schedule)

E. LOCATION OF UTILITIES

The locations of existing utilities are shown on the Contract drawings as an approximation only. The Contractor shall perform a pre-construction utility survey, including any required test pits, to determine the location of all known utilities no later than thirty (30) calendar days before commencing physical site work in the affected area.

F. POST UTILITY SURVEY – NOTIFICATION

Following completion of a utility survey of existing locations, the Contractor will be responsible to notify the Engineer of any known conflicts associated with the actual location of utilities prior to the start of the work. The Engineer and the Contractor will coordinate with any utility whose assets are to be affected by the Work of this Contract. A partial list of utility contact information is provided in the Project Utility Coordination Form.

G. MEETINGS AND COOPERATION WITH UTILITY OWNERS

The Contractor shall notify the Engineer in advance of any meeting they initiate with a Utility Owner's representative to allow MassDOT to participate in the meeting if needed.

Prior to the Pre-Construction Meeting, the Contractor should meet with all Utility Owners who will be required to perform utility relocations within the first 6 months of the project, to update the affected utilities of the Project Utility Coordination Form and all other applicable Contract requirements that impact the Utilities. The Contractor shall copy the Engineer on any correspondence between the Utility Owner and the Contractor.

H. FORCE ACCOUNT / UTILITY MONITORING REQUIREMENTS

The Engineer will be responsible for recording daily Utility work force reports. The start, suspension, re-start, and completion dates of each of the Utilities, within each phase of the utility relocation work, will be monitored and agreed to by the Engineer and the Contractor as the work progresses.

I. ACCESS AND INSPECTION

The Contractor shall be responsible for allowing Utility owners access to their own utilities to perform the relocations and/or inspections. The Contractor shall schedule their work accordingly so as not to delay or prevent each utility from maintaining their relocation schedule.

COMPLIANCE WITH THE NATIONAL DEFENSE AUTHORIZATION ACT

(Supplementing Subsection 7.01)

On all projects, the "Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment" Regulation (2 CFR 200.216) prohibits the Contractor from using or furnishing the following telecommunications equipment or services:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- Telecommunications or video surveillance services provided by such entities or using such equipment.
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

This prohibition applies to all products manufactured by the aforementioned companies, including any individual components or parts.

By submitting a bid on a project, the Contractor certifies that all work will be in compliance with the terms of 2 CFR 200.216. The Contractor shall submit a COC indicating compliance with the above provisions for all telecommunications equipment or services included in the Contract.

Payment for the item in which the materials are incorporated may be withheld until these COCs are received. Any cost involved in furnishing the certificate(s) shall be borne by the Contractor.

BUILD AMERICA BUY AMERICA PREFERENCE

On Federally-aid projects the Buy America (23.CFR § 635.410) and Build America, Buy America Act. requires the following,

(1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, must occur in the United States. Foreign steel and iron can be used if the cost of the materials does not exceed 0.1% of the total Contract cost or $2,500, whichever is greater. The action of applying a coating to a covered material (i.e., steel and iron) is deemed a manufacturing process subject to Buy America. Coating includes epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of a material subject to requirements of Build America, Buy America. Steel used for temporary support of excavation, including H piles, soldier piles, and sheeting when the steel is required to be left in place is subject to requirements of Build America, Buy America. Temporary steel, shall remain in place when it falls within the influence zone of the soil supporting any structure or railroad tracks.

(2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States and

(3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. “Construction materials” includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of:
   - non-ferrous metals,
   - plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables),
   - glass (including optic glass),
   - lumber; or
   - drywall.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

All articles, materials, and supplies should be classified as an iron or steel product, a manufactured product, or another product as specified by law or in 2 CFR part 184 (such other products specified by law or in 2 CFR part 184 include “excluded materials” and “construction materials”); an article, material, or supply must not be considered to fall into multiple categories.

TRAFFIC OFFICERS AND RAILROAD FLAGGING SERVICE

(Supplementing Subsection 7.11)

Under the provisions of Chapter 634 of the Acts of 1971, the railroad shall furnish, without cost, the necessary flag protection on the railroad right-of-way which may be required for bridge inspection, maintenance and repair, reconstruction or replacement.

The Contractor, however, is responsible for all costs incurred in restoring tracks that have been disturbed by the Contractor's operations. Reference is made to the Railroad Special Provisions hereinafter included.

MASSDOT/CSXT AGREEMENT PROVISIONS

The Contractor will be required to enter into a Right-of-Entry Agreement (ROE) with CSXT. The Contractor must include an outline of the proposed construction schedule; and approximate duration of work including the anticipated amount of flagging days that will be required.

No work may commence on or adjacent to CSXT right of way or that could potentially impact CSXT operations until the following have occurred:

- Final plans have been reviewed with no exceptions taken;
- A fully executed Right-of-Entry Agreement is in place with the appropriate parties;
- The necessary construction submissions have been submitted with no exceptions taken by CSXT or its representative;
- The Contractor’s insurance has been approved in writing by CSXT;
- A pre-construction meeting has been held with a CSXT representative present;
- Proper notification to proceed has been given to CSXT;
- A CSXT flagman is scheduled and on site.

EQUIVALENT SINGLE AXLE LOADS (ESALS)

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is 1.9 Million 18-kip (80-kn) ESALs.

TRUCK SAFETY DEVICES

(Supplementing Subsection 7.04: Motor Vehicles)

All motor vehicles subject to Section 7 of Chapter 90 to be operated under this Contract shall be equipped with safety devices as provided therein and in 540 CMR 4.00.

By December 31, 2025, the Contractor shall certify to the Registry of Motor Vehicles, in a manner prescribed by the Registrar, that all applicable vehicles are equipped with Lateral Protective Devices, Convex Mirrors, Cross Over Mirror(s) and Back Up Cameras in accordance with the requirements of 540 CMR 4.00.

The Contractor shall provide evidence satisfactory to the Department to demonstrate compliance with the above certification requirement for all applicable vehicles operated under this Contract by the Contractor and its subcontractors and vendors in a manner set forth by the Department. Thereafter, the Contractor shall have an affirmative obligation to continue to provide such evidence of compliance on an ongoing basis and no later than 7 days after certification with the Registry of Motor Vehicles of any additional vehicles operated under this Contract by the Contractor and its subcontractors and vendors.

Non-compliance with respect to a vehicle that is subject to 540 CMR 4.00 may subject the Contractor to statutory fines as established in M.G.L. c. 90, § 7 and/or contractual remedies up to and including termination of the Contract.

ENVIRONMENTAL PERMITTING

The proposed work does not occur in jurisdictional wetland resources subject to Section 401 or Section 404 of the Clean Water Act; therefore, the project does not require a Water Quality Certification from the Massachusetts Department of Environmental Protection or authorization from the US Army Corps of Engineers. The proposed work qualifies for the bridge exemption authorized in the Transportation Bond Bill and is therefore not subject to the Massachusetts Wetlands Protection Act, the Massachusetts Public Waterfront Act (Chapter 91), or the Massachusetts Environmental Policy Act.

If field conditions and/or Contractor-proposed erection, demolition, staging, or other procedures require work to occur in or otherwise impact water or wetland resource areas, the Contractor is advised that no associated work can occur until all required environmental permits have been obtained allowing such work. The Contractor must notify the District 2 Highway Director and Resident Engineer in writing at least 60 days prior to desired commencement of the proposed activity. All environmental submittals, including contact with Local, State, or Federal environmental agencies, must be coordinated with the District 2 Environmental Engineer. The Contractor shall fully cooperate with requests for information and provide same in a timely manner. The Contractor is further advised that the Department will not entertain a delay claim due to the time required to obtain the environmental permits.

GENERAL REQUIREMENTS FOR DEMOLITION AND WORK INVOLVING PAINTED STEEL

(02/06/2020)

Demolition and work involving painted steel shall conform to the requirements of Subsection 961 of the Standard Specifications.

Work Involving Painted Steel

Hazardous materials shall be removed in the immediate area of any intended welding, heating, saw cutting or burning of steel. Hazardous material removal is required to allow the demolition of structural steel, railings, drainage systems, utility supports, steel lamp posts, etc.

The Contractor shall assume that the coatings on the steel contain lead (Pb), unless otherwise determined by testing. The Contractor shall certify in writing to the Engineer the results of all testing, and shall also certify that any lead (Pb) coated steel removed from the project was not reused or buried, but was sent to a scrap metal recycling facility.

Implement and maintain programs and procedures, which comply with the requirements of this specification and all applicable standards and regulations. Comply with all applicable regulations even if the regulation is not specifically referenced herein. If a state or local regulation is more restrictive than the regulation of this specification, follow the more restrictive requirements.

This requirement is intended only for the demolition and preparation prior to repair and does not include provisions for recoating of steel.

Environmental

All applicable portions of Subsections 961.65 “Worker Protection” and 961.66 “Environmental Protection and Monitoring” shall be followed when performing this work.

During chemical stripping a hand washing facility may be used in lieu of a decontamination/changing facility.

Hazardous material shall be collected during the disassembly and disposed of as outlined in Subsection 961.68 “Handling of Hazardous Waste and Reporting Release Programs”.

The applicable submittals shall be according to Subsection 961.69 “Submittals”.

GENERAL REQUIREMENTS FOR DEMOLITION AND WORK INVOLVING PAINTED STEEL (Continued)

Cleaning/Removal

Cutting Or Burning Of Steel

All surfaces to be welded, heated, saw cut or burned shall be cleaned so as to remove all contaminants and/or hazardous materials, which could be discharged to the environment as a function of the subsequent operations.

Lead paint shall be removed in its entirety in an area prescribed by a 6 inch (15 cm) minimum offset from the required work. The paint removal operation may be dry abrasive blasting, wet abrasive blasting or chemical stripping.

Proper level of containment shall be used when performing this work in accordance with Subsection 961.67 "Containment". Full containment is not required during chemical stripping operation however; the Contractor shall install proper shielding and/or tarpaulins under the chemical stripping operations in order to catch all debris generated during this procedure. A cleaned area must be inspected and approved before the demolition operations are started.

During cleaning operations the Contractor shall be required to furnish and erect temporary floodlights illuminating the steel surface at a minimum of 30-foot candles. This lighting shall be used in areas where there is insufficient lighting for proper cleaning operations and inspection. The Contractor shall supply electrical power.

The Contractor shall provide support for interim and final inspection of the bridge during cleaning operations. This support shall include the necessary traffic controls and safe access to the work.

Mechanical Disassembly Of Steel

All surfaces to be mechanically disassembled by shear cutting or removing bolts or rivets shall not require deleading. When shear cutting or removing bolts or rivets, the Contractor shall not use any method that will cause dust and/or particles to be emitted and/or dispersed into the environment to an extent that would expose the workers above the Action Levels of 30µg/m3.

For purposes of limiting the lead (Pb) dust, the Contractor will be required to dampen the lead paint work areas.

The Contractor shall install a proper shielding and/or tarpaulins under all lead-paint-coated surfaces to be shear cut or bolts or rivets ordered removed in order to catch any loose lead paint chips, dust or particles.

PIGEON WASTE

The Contractor shall remove and dispose of the pigeon waste and any other debris accumulated on the steel members and bridge seats in areas where work is being performed. Pigeon waste and debris material contaminants will require special handling and disposal in accordance with all Federal, state, and local requirements. No separate payment will be made for removal and disposal of pigeon waste. Cost shall be incidental to the contract pay items.

EMERALD ASH BORER ADVISORY

To the extent possible, all trees and brush shall be disposed on site, typically chipped and spread in place. When trees or brush must be removed, such as in urban, or otherwise populated areas, Contractor shall identify proposed location for disposal, and provide written notification to the Engineer for approval. Disposal shall be in city or town of project, or at minimum, within county, of construction operations.

CONTAMINATED SOIL

Soil to be removed from the project area shall not be assumed to be uncontaminated and must be evaluated prior to off-site management for potential contamination with hazardous materials. No soil may be disposed of off-site without proper assessment by the Contractor and approval from the Resident Engineer (RE), District Environmental Engineer (DEE), or the project designee.

SOIL STOCKPILING DIRECTIVE P-22-001

Any stockpiling of soil must be performed in compliance with Project Directive P-22-001, Off-Site Stockpiling of Soil from MassDOT Construction Projects. This directive limits the allowable locations for off-site stockpiling of soil generated during MassDOT projects and includes various requirements that must be satisfied by the Contractor prior to off-site stockpiling. The Contractor is responsible for identifying a suitable stockpile location.

NORTHERN LONG-EARED BAT AND TRICOLORED BAT PROTECTION

The northern long-eared bat (*Myotis septentrionalis*; NLEB) and tricolored bat (*Perimyotis subflavus*; TCB) are listed as federally endangered or proposed endangered, respectfully, under the Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (USFWS) developed this guidance to address ESA compliance and promote conservation of NLEB and TCB. This project has been consulted with the USFWS through the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA) Programmatic Biological Opinion/Conference Opinion for Transportation Projects in the Range of the Indiana bat, northern long-eared bat, and tricolored bat, dated December 13, 2024. and generated a May Affect, Not Likely to Adversely Affect (NLAA) determination (Document A00877). Subsequently, the project has completed Section 7 consultation under the ESA.

In advance of the uplisting of the TCB to endangered under the ESA, the following Avoidance and Minimization Measures (AMMs) must be strictly adhered to in order to protect NLEB and TCB and to be in compliance with the ESA. Contact MassDOT Environmental Services - Wildlife Unit Supervisor for questions about project limits, restrictions, or conservation measures.

General AMM

- The Contractor shall ensure all personnel working in on the project site are aware of all environmental commitments related to NLEB and TCB, including all applicable AMMs. NLEB and TCB information (https://www.fws.gov/midwest/endangered/mammals/nleb/ and https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus) shall be made available to all personnel.
- On 6/19/2023, MassDOT Highway Division Environmental Services conducted a northern long-eared bat summer presence/absence survey, in accordance with the 2023 survey guidelines. The survey did not confirm the presence of NLEB and/or TCB. If work is proposed by the Contractor past 6/19/2028, additional review is required by the MassDOT Highway Division's Environmental Services Section, and additional review and restrictions may be required by the USFWS.

Tree Removal AMMs

- *If additional cutting is proposed by the Contractor that is outside the scope of this contract, additional review is required by the MassDOT Highway Division's Environmental Services Section, and additional review and restrictions may be required by the USFWS.*

Bridge AMM

- On 7/18/2025, MassDOT Highway Division Environmental Services, conducted a northern long-eared bat bridge/structure bat assessment, in accordance with the USFWS guidelines. The assessment did not find presence of, or evidence of use by bats, and as stated within the guidelines, the assessment is valid for two years. If bridge work is not complete before 7/18/2027, assessment of the bridge for the presence of, or evidence of use by, bats shall be completed by the MassDOT Wildlife Unit prior to continuing bridge work. The Contractor shall notify the MassDOT Wildlife Unit no later than fourteen (14) days prior to 7/18/2027 to provide adequate time for inspection. If bats are found to be present, or, if there is evidence of bat usage, work at the bridge shall not commence until after the MassDOT Wildlife Unit has completed coordination with the US Fish and Wildlife Service to determine the appropriate follow up or mitigation actions.

NOTICE TO OWNERS OF UTILITIES

(Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or municipal and State officials owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one week in advance of the commencement of such operations. The Contractor shall, at the same time, file a copy of such notice with the Engineer.

The following are the names of owners of the principal utilities affected as well as other major contacts, but the completeness of this list is not guaranteed:

Eversource Electric West
300 Cadwell Drive
Springfield, MA 01104
Nicholas Langone
413-787-9022
Nicholas.langone@erversource.com

Exon Mobil
145 Albany Street
Springfield, MA 01105
Mark Whitt

Eversource Gas
995 Belmont Street
Brockton, MA 02301
Bryan Meccariello
413-784-2208
Bryan.meccariello@eversource.com

Verizon
385 Myles Standish Blvd.
Taunton, MA 02780
Karen Mealy
774-409-3160
Karen.mealy@verizon.com

AT&T Teleport Communications America
c/o Siena Engineering Group
50 Mall Road
Burlington, MA 01803
Erica Hudson
781-221-8400, EXT 7041
Erica.hudson@sienaengineeringgroup.com

T-Mobile
400 Taylor Street
Springfield, MA 01105
Mike Hanifan
413-237-2598

Springfield Water and Sewer Commission
250 M Street Extension
Agawam, MA 01001
Dave Szymczakiewicz
413-452-1318
dave.szymczakiewicz@waterandsewer.org
Cy Ryding
413-668-6504
cy.ryding@waterandsewer.org

CSX Transportation
2000 West Cabot Blvd – Suite 130
Langhorne, PA 19047
Michael Sliper
Michael_Sliper@csx.com

Pioneer Valley RR.
100 Springdale Road
Westfield, MA 01085
Larry Bates
413-568-3331
bates@pvrr.com

Comcast Cable Corporation
PO Box 6505, 5 Omni Way
Chelmsford, MA 01824
Wendy Brown
978-848-5163
Wendy_Brown@comcast.com

NOTICE TO OWNERS OF UTILITIES (Continued)

Crown Castle
80 Central Street
Boxborough, MA 01719
Mark Bonanno
508-616-7818
Mark.bonanno@crowncastle.com

Five Colleges Inc.
97 Spring Street
Amherst, MA 01002
Tom Brennan
Tebrennan@fivecolleges.edu

MCI-Verizon Business
PO Box 600
Charlton, MA 01507
Stephen Parretti
508-248-1305
Stephen.parrette@verizon.com

Springfield Fire Alarm
605 Worthington Street
Springfield, MA 01105
Fire Marshal Captain Rivera
413-750-2407

Springfield City Engineer
70 Tapley Street
Springfield, MA 01104
Christopher Cignoli
413-787-6224
ccignoli@springfieldcityhall.com

Local Linx
30 Elmview Circle
Dover, NH 03820
Jason Wing
403-538-4545
Jason.wing@locallinx.com

Lumen
1025 Eldorado Blvd.
Broomfield, CO 80021
Renoy Thomas
516-712-3041
relocations@lumen.com

N.E Central Railroad
2 Federal Street Suite 201
St Albans, VT 05478
Greg Breaston
Greg.breaston@gwrr.com

Amtrak
30th Street Station Box 64/2955 Market Street
Philadelphia, PA 19104
Michael Kolonauski
(215) 349-1750
Michael Kolonauski@amtrak.com

Verizon Wireless Small Cell
20 Alexander Driver
Wallingford, CT 06492
Liz Glidden
Elizabeth.glidden@verizonwireless.com

Pioneer Valley Transit Authority
Sandra Sheehan, Administrator
PVTA Administration Offices
2808 Main Street
Springfield, MA 01036
413-732-6248, EXT 216
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Pioneer Valley Transit Authority
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NOTICE TO OWNERS OF UTILITIES (Continued)

The following website lists the names and addresses of the utilities presumed to be affected, but the completeness of the list is not guaranteed: https://www.mass.gov/info-details/utility-contacts-by-district-and-municipality

Select Quick Links
Select Doing Business with the Highway Division
Select Design/Engineering
Select Utility Contacts
Select District
Select City/Town, then locate the utility.

Town officials are shown at the website: https://www.mass.gov/lists/massachusetts-city-and-town-websites

From the Main Menu Selection Box select "Local Officials", then in the right margin under "Online Services" select "Local Officials Directory". Enter the city/town on the left of the webpage and locate the official to contact.

UTILITY WORK COORDINATION

Coordination with the work of utility companies is required. The infrastructure of all utilities in the project requires alterations and temporary and permanent works are required under this contract in support of the utility infrastructure work by others. All existing utilities are subsurface.

The project must be constructed in two major stages to maintain one direction of travel through the project and also to enable utility lines to continue functioning while relocations are being constructed. In the first construction stage a portion of the existing westerly sections of the two existing bridge superstructures and portions of their substructures will be removed and the most westerly portions of the new bridges will be constructed, followed by retaining wall and roadway widening work on the westerly side of Armory Street. This completed work will enable some utilities on the existing bridges to be relocated to the new sections of the two bridges and roadway. However, some existing utilities must be supported in place across the two bridges as further described herein, with the temporary supports constructed by the Contractor. In the second stage, the remainder of the two existing bridge superstructures and portions of the substructures on the easterly side will be removed and the remainder of the new bridges will be completed. Permanent utility supports across the bridges must be installed to replace the temporary supports constructed. This work will be followed by retaining wall construction and roadway reconstruction on the easterly side of Armory Street. The extent of new bridge construction impacts to the utilities extends to the ends of all the new bridge approach slabs, which are constructed to 15 feet beyond the back of the new abutments. Within the approach slab areas, the utilities must be aligned straight and no shut offs, manholes or other utility castings or structures are allowed within those areas.

UTILITY WORK COORDINATION (Continued)

Temporary utility support independent of the existing structure shall be constructed and maintained by the Contractor at Bridge No. S-24-026 to enable existing bridge demolition and new bridge construction until all utilities are permanently relocated within the new bridge, after which the temporary utility support shall be dismantled and removed from the project.

Multiple lateral and vertical temporary repositioning of the utilities is required to enable installation of the micropiles at the bridge abutments. The Contractor shall either shift, where feasible, or install and subsequently remove temporary utility supports between and across the bridge abutments for each such repositioning.

Eversource Gas owns a 6" intermediate pressure (IP) line on the easterly side of Armory Street from Genesee Street to the intersection at Albany Street where a 10" line on Albany Street joins and continues southerly on Armory Street as a 10" line. The 6" line is sleeved within a 10" casing on Bridge No. S-24-016, Armory Street over CSX Railroad. Continuing southerly beyond the Albany Street intersection, the 10" main crosses Armory Street at approximately 45 degrees, with the crossing ending north of the northerly abutment of Bridge No. S-24-026, Armory Street over Abandoned Railroad. The line continues on the westerly side of the bridge to the Taylor Street intersection. An abandoned 6" gas line occupies a utility bay on the easterly side of Bridge No. S-24-026, but that line is active beginning beyond the southerly abutment of the bridge.

Prior to Stage 1 NTP Eversource Gas will construct an upgrade to their existing gas line within Liberty Street outside the project limits. The upgrade will enable Eversource Gas to deactivate and abandon the existing 6" gas line that crosses Bridge No. S-24-016, specifically between an existing gas line junction within the Genesee Street/Warwick Street/Armory Street intersection and an existing gas line junction within the Albany Street/Armory Street intersection. The existing 10" gas main that runs south on Armory Street from the Albany Street intersection, crosses Armory Street at approximately 45 degrees to a location on the westerly side of the street just north of Bridge No. S-24-026, then crosses Bridge No. S-24-026 to connect to a main on Taylor Street, will need to remain in operation. The existing gas line on Bridge No. S-24-026 shall be supported separate from the existing bridge structure by a temporary support system. A section of new gas main will be installed by Eversource Gas from a new connection to the existing 10" gas main to the north of the approach slab at Bridge No. S-24-026 and extend across the new bridge within an internal bay on new supports constructed by the Contractor.

South of the bridge the new gas line will connect to an existing gas line in Taylor Street . The new bridge abutment backwalls at Bridge No. S-24-026 must be constructed to accommodate the existing active gas main in place until the new gas main is in place and operational.

Eversource Gas will adjust their castings to meet the pavement surface during all stages of construction to maintain traffic.

Eversource Electric owns several electrical manholes and duct banks between the Genesee Street/Warwick Street and Taylor Street intersections. The duct banks consist of 9-4" concrete encased conduits between Genesee Street/Warwick Street and the manhole at Albany Street and 6-4" concrete encased conduits between the manhole at Albany Street and the manhole at Taylor Street. Conduits on the bridges are not concrete encased.

UTILITY WORK COORDINATION (Continued)

In Stage 1 the Contractor shall construct temporary electrical conduit support at Bridge No. S-24-016 and utilize the temporary utility support system installed at Bridge No. S-24-026 to carry all existing Eversource Electric conduits in their existing locations to provide continuous uninterrupted electrical power while bridge demolition and new bridge construction are conducted. In Stage 1 the Contractor shall install three temporary Eversource Electric conduits in both surface and subsurface configurations as noted on the plans to enable installation of the micropiles. After Eversource installs and energizes these cables in the three temporary conduits the Contractor shall remove the existing 3 x 3 duct bank. . The Contractor shall install the final proposed 2 x 3 electrical duct bank in its final location on temporary supports that will remain until the final supports on the bridges can be constructed. After Eversource Electric pulls and energizes their new cable in the new duct bank, the Contractor shall remove all existing electrical conduit and cable on the bridges, all temporary conduit installations, existing concrete encased duct bank to 5' from the manholes, and all temporary supports. Removal and disposal of existing installations on the bridges from approach slab to approach slab shall be included under the lump sum bridge items.

Eversource Electric will remove and replace their existing electrical manholes at the Albany St intersection and the Taylor St intersection. Eversource Electric will conduct all work involving their facilities within five feet of their manholes, including conduit removal and installation and alterations to the manholes. Alterations to their manholes includes constructing access openings and adjusting manhole casting elevations that are required to meet the pavement surface during all stages of construction to maintain traffic.

The Springfield Water and Sewer Commission owns a 12" water main between the Genesee Street/Warwick Street and Taylor Street intersections. Within the roadway approaches at each of the four existing bridge abutments the existing water main profile transitions in elevation from an approximate 5-foot depth of bury to a much shallower depth so that it can be supported directly under the existing bridge decks. The water line reduces in size to 10" and is sleeved in a casing pipe at Bridge No. S-24-016.

In Stage 1 the existing water main will remain within the undisturbed easterly sections of Bridge No. S-24-016 and Bridge No. S-24-026. Following completion of the Stage 1 bridge work, roadway widening and retaining wall construction, a new 12" water main shall be installed along the newly constructed westerly facia of the two bridges and retaining walls and supported at vertical transitions on concrete gravity blocks, connecting to existing water mains at the Genesee Street/Warwick Street and Taylor Street intersections. Removal of existing water main on the bridges shall be included in the lump sum bridge items.

The Contractor shall adjust water main castings to meet pavement surfaces during all stages of construction to maintain traffic.

UTILITY WORK COORDINATION (Continued)

The Springfield Water and Sewer Commission operates a 15" VCP sanitary sewer on the northerly approach to Bridge No. S-24-016 that will be impacted by the project. The Contractor shall relocate the pipe (new) and construct new sanitary sewer manholes to the locations shown on the plan, with the proposed doghouse manhole in Armory Street constructed first. A temporary bypass from this manhole to the existing manhole located just west of the bridge is required.

AT&T owns a 4" telecommunication conduit in Albany Street that enters an existing manhole at that intersection on Armory Street. The conduit continues southerly along the westerly side of Armory Street and the westerly side of Bridge No. S-24-026, then continues southerly through the Taylor Street intersection. In Stage 1 the Contractor shall support the conduit on the temporary utility support system at Bridge No. S-24-026, as previously noted, until the new utility supports are complete. Temporary shifts of the AT&T conduit are required to enable installation of the micropiles. AT&T will adjust their castings to meet pavement surfaces during all stages of construction to maintain traffic.

Existing telecommunication conduits owned by Verizon, Comcast, and Crown Castle that occupy the easterly side of Armory Street and the two bridges shall be maintained operating in place during Stage 1. In Stage 2 temporary utility support shall be provided at the two bridges for telecommunication conduits in existing, temporary, and proposed final configurations until the permanent supports are provided on the reconstructed bridges. New Verizon conduits in a 2 x 3 duct bank shall be installed and mounted on Bridge No. S-24-016. Off the bridge, the 2 x 3 duct bank shall be encased in concrete and capped beyond the northerly approach slab. The new Verizon conduits south of the bridge shall be constructed in a 2 x 3 duct bank and encased in concrete, sweeping easterly to a new Verizon manhole that Verizon will install in Albany Street. Verizon will remove their existing manhole at the Albany Street intersection after they relocate their cables to the new manholes and duct banks. To the south of the Albany Street intersection the proposed Verizon 2 x 3 concrete encased duct bank shall continue to a new Verizon manhole that Verizon will install to the north of the Bridge No. S-24-026 approach slab. The Verizon duct bank shall be mounted on new supports across Bridge No. S-24-026 and continue off the bridge (concrete encased) to their existing manhole at the Taylor Street intersection. The Contractor is responsible for supplying and installing the conduit within trenches off the bridges and mounting the conduit on approved supports on the bridges to five feet outside the Verizon manholes. Verizon will supply the FRE conduits that will be bridge mounted. The Contractor is responsible for obtaining all other conduit installed off the bridges and for all temporary conduit. The Contractor shall be responsible for removal of the existing Verizon duct banks in all locations where conflict with proposed work occurs. Removal of all telecommunication and abandoned conduit on the bridges shall be included in the lump sum bridge items.

Verizon will remove and replace their existing manhole at the Albany St intersection and conduct all work involving their facilities within five feet of their manholes, including conduit removal and installation and alterations to the manholes. Alterations to their manholes includes constructing conduit access openings and adjusting manhole casting elevations to meet the pavement surface during all stages of construction to maintain traffic.

UTILITY WORK COORDINATION (Continued)

Comcast owns 2-4" conduits from a manhole north of Bridge No. S-24-016 in Armory Street that continues over the two bridges to an existing manhole at the intersection of Armory Street/Taylor Street. Comcast also owns conduit within Albany Street. In Stage 2 the Contractor shall install 2-4" conduits adjacent to the existing Comcast conduits from5' outside the existing Comcast manhole north of Bridge No. S-24-016 in Armory Street to 5' outside a new Comcast manhole at the Albany Street intersection, with the Contractor providing temporary utility support separate from the existing bridge structure over Bridge S-24-016. Comcast will install a new manhole at the intersection of Albany Street/Armory Street and complete the conduit within 5feet of the new manhole. New Comcast conduit shall be installed in Albany Street from 5' outside their new manhole at the Albany Street intersection to 5' outside their existing handhole that is located further to the east in Albany Street. Comcast will complete the final connections to their manholes and handholes. Continuing south on Armory Street, the Contractor shall install 2-4" conduits adjacent to the existing Comcast conduits within Armory Street and over Bridge S-24-026 to within 5' of a new manhole that Comcast will install at the Taylor Street/Armory Street intersection. The temporary utility support system at Bridge No. S-24-026 shall be used for support of the existing and proposed Comcast conduits at that structure. Abutments at both bridges shall accommodate the existing and proposed conduit configurations, and for the interim condition that includes the space required for both the existing and proposed conduits. The existing Comcast conduits on the bridges shall be removed after Comcast energizes their new cables. None of the Comcast conduits shall be concrete encased. Removal of the Comcast conduits on the bridges is included under the bridge lump sum items.

Crown Castle owns 2-4" conduits from a manhole north of Bridge No. S-24-016 in Armory Street to the existing Verizon manhole at the Albany Street/Armory Street intersection, with at least one conduit believed to be included in the duct bank configuration owned by Verizon that crosses the bridge. The existing Crown Castle conduits continue south in Armory Street and over Bridge No. S-24-026 to the existing Verizon manhole in the Armory Street/Taylor Street intersection. Two 4" conduits shall be installed by the Contractor from 5 feet outside their existing manhole north of Bridge No. S-24-016 to 5 feet outside the Verizon manhole at the Taylor Street intersection. Temporary utility support shall be provided for the existing and proposed Crown Castle conduits over both bridges. Abutments at both bridges shall accommodate the existing and proposed conduit configurations, and for the interim condition that includes the space required for both the existing and proposed conduits. The existing Crown Castle conduits on the bridges shall be removed after Crown Castle energizes their new cables. None of the Crown Castle conduits shall be concrete encased. Removal of the Comcast conduits on the bridges is included under the bridge lump sum items.

The proposed Verizon, Comcast and Crown Castle conduits must be shifted to temporary locations across both bridges to enable installation of the micropiles at the abutments. Their conduits must then be shifted again to the final locations. The utilities will install and activate new cables while operating the existing cables in a sequence that maintains operation of their facilities at all times. The Contractor shall provide and install all temporary supports, conduit, and fittings, including but not limited to split casings or flexible casings, to complete each shift required.

UTILITY WORK COORDINATION (Continued)

Power for existing street lighting is provided by existing subsurface conduits that connect to the nearest Eversource Electric manholes. These conduits shall be preserved to the most practicable extent and new conduit shall be connected to the ends and extended to the relocated light poles, all of which are located at moment slab locations. Eversource Electric will install cable from their manholes to each relocated light pole and activate the new circuits. Eversource Electric may also install new luminaires, but the Contractor shall remove and protect the existing luminaires for reinstallation and reuse at the relocated locations as a precaution in case new luminaires are not installed by Eversource.

The new traffic signal system at the Albany Street intersection will be powered from the new Eversource Electric manhole that Eversource will install at that intersection. The Contractor shall install new conduit from 5 feet outside the new manhole, with the final connection to the manhole installed by Eversource, to the meter at the controller cabinet. Eversource Electric will install the cable from the manhole to the meter.

The Contractor shall be responsible for adjusting to grade all water main castings, drainage system castings, and sewer castings for the number of times requiring adjustment to grade as approved by the engineer. In addition, the Contractor shall be responsible for the removal and disposal of all utility infrastructure on the existing bridges and where project work intersects the existing infrastructure on the roadway approaches to the bridges.

EVERSOURCE EMERGENCY TELEPHONE NUMBERS

GAS:
Outage/ Emergency: 800-592-2000
New Service: 866-678-2744
Customer Support: 800-592-2000

ELECTRIC:
Outage/ Emergency: 800-592-2000 or 844-726-7562
New Service: 1-888-633-3797 (1-888-need pwr)
Customer Support: 1-800-340-9822

VALUE ENGINEERING CHANGE PROPOSAL

This Subsection defines the conditions and requirements which apply to Value Engineering Change Proposals ("VECPs"). The purpose of this provision is to encourage the Contractor to propose changes in certain project requirements that will maintain the project's functional requirements at a savings in contract time, contract price, or both. The net savings obtained by using a VECP that meets the conditions and requirements set forth here will be shared by the Contractor and MassDOT.

VECP's under this provison are to be initiated, developed and submitted to MassDOT by the Contractor. The VECP must show the contemplated changes to the Drawings, Specifications and other requirements in the Contract. When a VECP submitted pursuant to this section is fully accepted by MassDOT, the VECP will be implemented by the Contractor and paid using the current cost and resource loaded schedule. Contractor shall demonstrate that the VECP is equal to, or better than, the original design or material; that there is an interest in public safety within the VECP; that there is a life-cycle cost benefit; and/or that end users will benefit from the shortened schedule. VECPs shall be consistent with the MassHighway/MassDOT Standard Specifications for Highways and Bridges and other applicable reference documents and directives. Any proposed deviation from these documents will need to be clearly identified in the VECP Proposal Documents, and must be approved by MassDOT's Chief Engineer before accepting this VECP.

A. In order to be considered for MassDOT review each VECP shall:

1. Be clearly labeled pursuant to this Subsection;

2. Yield a net savings at least two hundred and fifty thousand (250,000.00) Dollars and/or a net saving of contract completion duration of at least three (3) months;

3. The proposed changes to contract items must:

    a. maintain the specified items' required functions (service life, reliability);

    b. meet applicable safety regulations and codes;

    c. material substitutions must be in accordance with DOT prequalified/preapproved products and must be tested in accordance with standard material specs/testing methods (and considering all relevant environmental, load, and other relevant factors);

    d. show economy of operation, ease of maintenance, ease of construction, and necessary standardized features and appearance; and

4. Shall not require an extension of Contract Time or Contract Milestones, with the exception of cases when there are anticipated significant cost saving.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

The thresholds above are considered to be a general guideline. MassDOT will consider VECPs outside of these thresholds if a significant benefit is demonstrated. Additionally, notwithstanding this VECP process, MassDOT will consider minor revisions in the form of a Contract Modification.

Further, any VECP submitted shall be in sufficient detail to clearly define the proposed change. The Contractor's failure to provide information of the type, detail and in a format to facilitate the MassDOT's review, may be grounds for rejection of the VECP. Additionally, the Contractor will not be entitled to any equitable adjustment or increased Time, due to any aspect of any of the proposed VECP including permitting, right of way, utility coordination or delayed responses by MassDOT. If, after the progression of the work associated with the executed Contract Modification for the VECP, any additional costs are realized by the Contractor or any of the sub- consultants, sub-contractors, or suppliers, the Contractor shall be obligated to pay for any and all costs.

B. The following initial items shall be provided by the Contractor for MassDOT's review. *Items 1-6 need to be submitted prior to the start of MassDOT's review of the VECP and item 7 is an important consideration for the pricing of the VECP and the timeline of the proposed VECP schedule.*

1. ***VECP Description***: A description of the difference between the existing and the proposed Contract requirements, and the comparative advantages and disadvantages of each;

2. ***VECP Change Listing***: A listing of the Contract requirements that will need to be changed, modified, or reviewed as well as the proposed Contract document changes in the Instructions to Bidders, Contract, Standard Specifications, General Requirements and Special Provisions required by the VECP.

3. ***Construction Schedule Update*:** Any changes in the Contract Time(s) or Contract Milestone(s), that will result from acceptance of the VECP, shall be accompanied by a contemporaneous schedule analysis *(i.e, the Contractor's baseline schedule submission, all past/required monthly schedule updates, a detailed assessment of all past delays, and a resource loaded Critical Path Method schedule as specified in Section 8.0 / Subsection 8.02 of this Contract)* of the projected Work that remains including the proposed VECP related schedule changes *(inclusive of the timeline to review accept the VECP and the timeline for implementing the design changes)* in the remaining work. This shall be submitted in the form of a Proposal Schedule until the VECP has been formally accepted. Note: All of this information is to be updated, recertified, and formally accepted by MassDOT before final acceptance of this this VECP is issued.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

4. ***Date for MassDOT's Acceptance***: A statement that clearly justifies the date by which the VECP must be accepted to obtain the maximum price reduction, noting any effect upon the Contract Time(s) and/or Contract Milestone(s). This statement must include a narrative that demonstrates the most recent construction schedule has been utilized to justify that proposed acceptance date *(e.g. "in order to start to fabricate critical materials, authorization must be provided to work on the shop drawings by no later than [date]").* The Contractor should allow for at least sixty (60) to ninety (90) days for acceptance by MassDOT once all of the VECP documentation has been provided. Acceptance shall mean that MassDOT has received a finalized and executed contract modification. However, this is a proposed Contract change.

   The Contractor is fully obligated to progress the Work of the original Contract and MassDOT is not liable for any delays or costs that may occur in the review phase of any VECP proposal.

5. ***Cost and Savings Estimates***: A detailed estimate of the anticipated net savings, calculated as follows:

   a. ***Original Scope:*** Isolate the cost of performing the original contract construction activities, in accordance with the original Contract Documents, as originally bid by the Contractor, that are anticipated to be superseded by the VECP. *This cost is to include any original contract scope that is anticipated to be altered or eliminated by the VECP such as, shop drawing preparation, inspection work, testing, maintenance of traffic, or any other original contract costs, that have yet to have been performed at the time of this VECP submission.*

   b. ***New VECP Scope:*** Calculate the cost of performing the comparable construction activities associated with the VECP.

   c. ***Contractor's Engineer & Inspection***: Calculate the cost of engineering, inspection, and design work by the Contractor's Engineer/Designer. This should be a realistic estimate of the costs of any required engineering, design and review work by the Contractor's Engineer.

   d. ***MassDOT's Costs:*** MassDOT's estimate of costs to perform engineering/design reviews, cost estimate reviews, schedule reviews, and any other administrative costs to review and recommend implementation of the proposed VECP. *(including all anticipated increased costs to MassDOT on other Contracts and all anticipated follow-on increased costs to MassDOT, if any)* as provided by MassDOT. MassDOT's estimated costs must be included the VECP calculation and will be provided by MassDOT in support of the VECP evaluation process.

   e. ***Other Costs:*** Estimated costs associated with any revisions to other project related costs, such as Environmental Permits or Right of Way acquisitions, including other agency or municipality costs, as provided by MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

Net Savings:
The net savings to be split between MassDOT and the Contractor shall be calculated using the items above as follows: a - (b+c+d+e) = net savings

6. *The Contractor shall also provide:*

   a. A proposed Change Order, which explains and justifies any required Equitable Adjustment in the Contract Price.

   b. The Contractor's actual costs expended for developing the VECP as of the date of the VECP submission;

7. ***Design Changes and Drawings*:** The costs that are outlined above should be inclusive of the following design and engineering responsibilities.

   a. Design changes shall be prepared and stamped by the Contractor's professional designer and/or engineer. In addition, in the development of the VECP; the Contractor is responsible for anticipating and managing all aspects associated with any VECP design work that must be performed by a licensed Engineer.

   b. The Contractor's engineer must analyze and stamp all components of any aspect of the project that has been redesigned, changed, or altered as a result of this VECP.

   c. The Contractor's engineer shall provide all calculations and supporting design/engineering documentation that was utilized to develop the changes and stamped drawings. These will be used by MassDOT's Designer-of-Record to review the VECP changes. The Contractor is limited to selecting only those engineer's that have been pre-qualified by MassDOT's A&E Board.

   d. MassDOT's Designer-of-Record will review and respond to all completed design submissions related to this VECP within thirty (30) calendar days, unless determined to be a non-critical path item.

   e. MassDOT will be responsible for estimating and managing MassDOT's Designer-of-Record during the VECP review and implementation. Should any significant conflicts arise, between the Contractor's Engineer and MassDOT's Designer-of-Record, the DOT and the Contractor will work expeditiously to resolve the conflict. Should this type of conflict continue for greater than five (5) days, the Contractor is to bear all financial and time related impacts of such delay and must seek to resolve the design conflict, in an acceptable manner to MassDOT. The resolution of this conflict will be funded at the Contractor's expense – exclusive of the net saving that was agreed to at the execution of the contract modification for this VECP.

   f. The Contractor's Engineer may also be required to inspect the construction work. The Contractor is to include such anticipated inspection costs in the initial VECP.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

g. MassDOT's Designer of Record will remain the Designer-of-Record for the entire Project. Any costs incurred in the use of MassDOT's Designer-of-Record by MassDOT or Contractor associated with the review of a VECP are to be included in the calculated net savings.

C. Approval of the VECP shall not occur until a Contract Modification, incorporating the VECP, is issued by MassDOT and properly executed by the Contractor. MassDOT may accept or reject part or all of any VECP at any time prior to an executed Contract Modification for the applicable VECP. The decision of MassDOT, concerning acceptance or rejection of any VECP, shall be final and shall not be subject to dispute resolution.

It is expected that several weeks may go by before the final VECP documentation has been executed with a Contract Modification. Therefore, MassDOT intends to make certain that the initial cost estimate information has not changed before entering into a Contract Modification. As the VECP evaluation process is finalized, and prior to the signed Contract Modification for the VECP, the Contractor and MassDOT must re-certify the current status of the originally proposed cost and/or schedule savings.

Until a contract modification is issued and schedule and cost/savings re-certification is complete and accepted by MassDOT, the Contractor shall remain obligated to perform the Work in accordance with the terms and conditions of the original Contract Documents.

Upon completion of the work associated with the VECP, MassDOT may require verification that the VECP savings has been achieved.

D. VECPs will be processed (distributed, reviewed, commented upon, accepted or rejected) expeditiously (pursuant to M.G.L. c. 30, § 39R); however, as this is an elective modification to the contract, MassDOT shall not be liable for any delay or cost in the review and acceptance of the VECP. During the review of the VECP, the Contractor remains obligated to progress the original Contract scope, and schedule, as planned; until a Contract Modification, accepting the Contractor re-certified VECP, has been executed by MassDOT.

The Contractor has the right to withdraw part, or all of any VECP, prior to acceptance by MassDOT. Such withdrawal shall be made in writing to the Engineer. The Contractor shall state the period of time, from the date of the initial VECP submittal, that the VECP shall remain valid and feasible. Revision of this validity and feasibility period shall be allowed only by mutual agreement of the Contractor and the Engineer in writing.

If the Contractor desires to withdraw the proposal prior to the expiration of this period for non-technical reason, MassDOT reserves the right to recover all actual costs that have been incurred to MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

If the Contractor withdraws the VEC Proposal, MassDOT reserves the right to proceed with the VECP or any portion of the VECP as a normal change and the Contractor waives any right it may have had to share in net savings thereunder.

For purposes of this provision, expiration of the time established by the Contractor for approval shall be considered as withdrawal by the Contractor if MassDOT requests an extension of that time and the Contractor does not provide a written extension.

E. With regard to unknown conditions or sub-surface work, in general, the expectation is that the Contractor and MassDOT will strive to gain enough knowledge about the risks in order to provide a forward-priced Change Proposal. Therefore, any costs to fully evaluate the proposal, such as additional borings and/or test pits, must be considered in the cost evaluation of whether the VECP is worth pursuing. However, if it is impractical to gather conclusive exploratory information, before the VECP is executed, MassDOT may consider provisions in the VECP that clearly identifies the risk sharing (cost and time) related specifically to the unknown/sub-surface conditions. If these VECP provisions are acceptable to MassDOT they are to include supplemental language to provide a determination of the final savings/cost, and time impacts, no later than 45 days after the sub-surface work is completed. All other aspects of the VECP, unrelated to these Provisions, will be binding upon execution of the VECP.

SUBSECTION 8.02 SCHEDULE OF OPERATIONS

Replace this subsection with the following:

An integrated cost and schedule controls program shall be implemented by the Contractor to track and document the progress of the Work from Notice to Proceed (NTP) through the Contractor Field Completion (CFC) Milestone. The Contractor's schedules will be used by the Engineer to monitor project progress, plan the level-of-effort required by the Department's work force and consultants and as a critical decision-making tool. Accordingly, the Contractor shall ensure that it complies fully with the requirements specified herein and that its schedules are both accurate and updated as required by the specification throughout the life of the project. Detailed requirements are provided in Division II, Section 722 Construction Scheduling.

SECTION 722
CONSTRUCTION SCHEDULING
DESCRIPTION

722.20 General

The Contractor's approach to prosecution of the Work shall be disclosed to the Department by submission of a Critical Path Method (CPM) schedule and a cost/resource loaded Construction Schedule as defined by the schedule type set forth below. These requirements are in addition to any requirements imposed in other sections.

This section establishes the requirement for scheduling submissions. There are four schedule types identified as types A, B, C and D.

All schedules shall be prepared and submitted in accordance with this specification and the instructions contained in the Construction Schedule Toolkit located on the MassDOT-Highway Division website at https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit.

Type A –

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded & Resource Loaded CPM
- Resources Graphic Reporting
- Cash Flow Projections from the CPM
- Cash Flow Charts
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software and computer

Type B –

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded & Resource Loaded CPM
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software and computer

Type C –

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software and computer

SECTION 722 (Continued)

Type D –

- Bar chart schedule updated monthly or at the request of the Engineer
- Short-term Construction Schedule
- Monthly Projected Spending Report (PSR)

EQUIPMENT, PERSONNEL

722.40 General

A. Software Requirements

The Contractor shall use Primavera P6 computer scheduling software.

In addition to the requirements of Section 740 – Engineer's Field Office and Equipment, the Contractor shall provide to the Department one (1) copy of the scheduling software, one (1) software license and one (1) computer capable of running the scheduling software for the duration of the Contract. This computer and software shall be installed in the Engineer's Field Office. The computer and software shall be maintained and serviced at no additional cost to the Department.

B. Scheduler Requirements

The Scheduler shall be approved by the Engineer.

For Type A, B and C Schedules the name of the Contractor's Project Scheduler together with his/her qualifications shall be submitted to the Department for approval by the Engineer within seven (7) Calendar Days after NTP. The Project Scheduler shall have a minimum of five (5) years of project CPM scheduling experience, three (3) years of which shall be on projects of similar scope and value as the project for which the Project Scheduler is being proposed. References shall be provided from past projects that can attest to the capabilities of the Project Scheduler.

SCHEDULING METHODS

722.60 General

A. Schedule Planning Session

The Contractor shall conduct a schedule planning session prior to submission of the Baseline Schedule. This session will be attended by the Department and its consultants. During this session, the Contractor shall present its planned approach to the project including, but not limited to:

1. the Work to be performed by the Contractor and its subcontractors;
2. the planned construction sequence and phasing; planned crew sizes;
3. summary of equipment types, sizes, and numbers to be used for each work activity;
4. all early work related to third party utilities;
5. identification of the most critical submittals and projected submission timelines;
6. estimated durations of major work activities;
7. the anticipated Critical Path of the project and a summary of the activities on that Critical Path;
8. a summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges;

SECTION 722 (Continued)

9. a summary of the anticipated quarterly cash flow over the life of the project.

This will be an interactive session and the Contractor shall answer all questions that the Department and its consultants may have. The Contractor shall provide a written summary of the information presented and discussed during the session to the Engineer. The Contractor's Baseline Schedule and accompanying Schedule Narrative shall incorporate the information discussed at this Schedule Planning Session.

B. Schedule Reviews by the Department

1. Baseline Schedule Reviews
   The Engineer will respond to the Baseline Schedule Submission within thirty (30) Calendar Days of receipt providing comments, questions and/or disposition that either accepts the schedule or requires revision and resubmittal. Rejected Baseline Schedules shall be resubmitted within fifteen (15) Calendar Days after receipt of the Engineer's comments.
2. Contract Progress Schedule / Monthly Update Reviews / Recovery Schedules
   The Engineer will respond to each submittal within twenty-one (21) Calendar Days. Rejected schedules shall be resubmitted by the Contractor within five (5) Calendar Days after receipt of the Engineer's comments.

The Engineer's review comments shall not be construed as direction to change the Contractor's means and methods. The review and acceptance of the CPM schedule does not relieve the Contractor of the responsibility for accomplishing the work within the contract required completion dates. Omissions and errors in the accepted CPM schedule shall not excuse performance less than that required by the Contract.

722.61 Schedule Content and Preparation Requirements

All schedules shall be prepared and submitted in accordance with the instructions contained in the Construction Schedule Toolkit located on the MassDOT-Highway Division website at:
https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit
and the following:

A. LOGIC

The schedules shall divide the Work into activities with appropriate logic ties to show:

1. conformance with the requirements of this Section and Division I, Subsection 8.02 - Schedule of Operations
2. the Contractor's overall approach to the planning, scheduling, and execution of the Work
3. conformance with any additional sequences of Work required by the Contract Documents, including, but not limited to, Subsection 8.03 - Prosecution of Work and Subsection 8.06 – Limitations of Operations.

SECTION 722 (Continued)

B. ACTIVITIES

The schedule shall clearly define the progression of the Work from the Notice to Proceed (NTP) to Contractor Field Completion (CFC) by using separate activities, or including attributes within appropriate activities, to address each of the following:

1. Notice to Proceed
2. Work Breakdown Structure
3. The Critical Path is clearly defined and organized.
4. Float shall be clearly identified.
5. Detailed activities to satisfy permit requirements.
6. Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
7. The preparation and submission of shop drawings, procedures, and other required submittals, with a planned duration that is to be demonstrated to the Engineer as reasonable.
8. The review and return of shop drawings, procedures, and other required submittals, approved or with comments, the duration of which shall be thirty (30) Calendar Days, unless otherwise specified or as approved by the Engineer.
9. Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before procuring and fabricating.
10. Each component of the Work defined by specific activities.
11. Right-of-Way (ROW) takings that have been identified in the Contract.
12. Early Utility Relocation (by others) that has been identified in the Contract.
13. Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third-party work affecting the Contract.
14. Utility work to be performed in accordance with the Project Utility Coordination (PUC) Form as provided in Section 8.14 - Utilities Coordination, Documentation and Monitoring Responsibilities
15. Access Restraints – restrictions on access to areas of the Work that are defined by the Department in the bid package, in Subsection 8.06 – Limitations of Operations or elsewhere in the Contract
16. Limitations of Work – time of year restrictions and any other limitations identified in the contract
17. Traffic work zone set-up and removal, night work and phasing
18. Material Certifications
19. Milestones listed in Subsection 8.03 - Prosecution of Work or elsewhere in the Contract Documents
20. For Type A and B Contracts only: All items to be paid for, including all Unit Price and Lump Sum pay items, shall be identified by activity. This shall include all non-construction activities such as engineering work; purchase of permanent materials and equipment, purchase of structural steel stock, equipment procurement, equipment delivery to the site or storage location and the representative amount of overhead/indirect costs that was included in the Contractor's Bid Prices.

SECTION 722 (Continued)

21. Contractor's request for validation of FBU (ready to open to traffic)
22. Full Beneficial Use (FBU) Contract Milestone per the following requirements: The majority of contract Work has been completed and the asset(s) has been opened for full multi-modal transportation use, except for limited contract work items that do not materially impair or hinder the intended public use of the transportation facility. All anticipated lane takings have been completed, except for minor, short term work items and as defined in Subsection 8.03 - Prosecution of Work
23. The Department's confirmation of completed work to allow for FBU.
24. Contractor's request for validation of Substantial Completion
25. Department generated punch list of twenty-one (21) Calendar Days
26. Substantial Completion Contract Milestone as defined in the standard specifications.
27. Punch list Completion Period of at least thirty (30) Calendar Days per the requirements of Subsections 5.11 - Final Acceptance, 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes
28. Contractor confirmation that all punchlist work and documentation has been completed.
29. Physical Completion of the Work Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
30. Documentation Completion per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
31. Contractor Field Completion Contract Milestone (which can also be considered the completion date) per the following requirements: All physical contract Work is complete including punchlist. The Contractor has fully de-mobilized from field operations and as defined in Subsection 5.11

C. EARLY AND LATE DATES

Early Dates shall be based on proceeding with the Work or a designated part of the Work exactly on the date when the corresponding Contract Time commences. Late Dates shall be based on completing the Work or a designated part of the Work exactly on the corresponding Contract Time, even if the Contractor anticipates early completion.

D. DURATIONS

Activity durations shall be in Work Days. Planned Original Durations shall be established with consideration of resources and production rates that correspond to the Contractor's Bid Price. Within all of the Department-required schedules, the Contractor shall plan the Work using durations for all physical construction activities of no less than one (1) Work Day and no greater than fourteen (14) Work Days, unless approved by the Engineer as part of the Baseline Schedule Review.

SECTION 722 (Continued)

Should there be an activity with a duration that is determined by the Engineer to be unreasonable, the Contractor will be asked to provide a basis of the duration using bid documents, historic production rates for similar work, or other form of validation that is acceptable to the Engineer. Should the Contractor and the Engineer be unable to agree on reasonable activity durations, the Engineer will, at a minimum, note the disagreement in the Baseline Schedule Review along with a duration the Engineer considers reasonable and the basis for that duration. A schedule that contains a substantial number of activities with durations that are deemed unreasonable by the Engineer will not be accepted.

E. MATERIALS ON HAND

The Contractor shall identify in the Baseline Schedule all items of permanent materials (Materials On Hand) for which the Contractor intends to request payment prior to the incorporation of such items into the Work.

F. ACTIVITY DESCRIPTIONS

The Contractor shall use activity descriptions in all schedules that clearly describe the work to be performed using a combination of words, structure numbers, station numbers, bid item numbers, work breakdown structure (WBS) and/or elevations in a concise and compact label.

G. ACTIVITY IDENTIFICATION NUMBERS

The Contractor shall use the activity identification numbering system specified in the MassDOT Highway Division Contractor Construction Schedule Toolkit.

H. ACTIVITY CODES

The Contractor shall use the activity codes specified in the MassDOT Highway Division Contractor Construction Schedule Toolkit.

I. CALENDARS

Different calendars may be created and assigned to all activities or to individual activities. Calendars define the available hours of work in each Calendar Day, holidays and general or project-specific non-Work Days such as Fish Migration Periods, time-of-year (TOY) restrictions and/or area roadway restrictions. All calendars shall extend two years beyond the current project completion date.

Project Special Provisions identify specific calendar restrictions some examples of special calendars include, but are not limited to:

- Winter Shutdown Period, specific work is required by separate special provision to be performed during the winter. See Special Provision 8.03 (if applicable)
- Peak traffic hours on heavily traveled roadways. This shall be from 6:30 am to 9:30 am and from 3:30 pm to 7:00 pm, unless specified differently elsewhere in the Contract.
- Special requirements by sensitive abutters, railroads, utilities and/or other state agencies as defined in the Contract.
- Planting seasons for trees, shrubs and grasses and wetlands mitigation work.

SECTION 722 (Continued)

- Cape Cod and the Islands Summer Roadway Work Restrictions: A general restriction against highway and bridge construction is enforced between Memorial Day and Labor Day, unless otherwise directed by the Engineer. Cape Ann Summer Roadway Work Restrictions: While there are no general restrictions for Cape Ann as there are for Cape Cod and the Islands, project-specific restrictions may be enforced.
- Turtle and/or Fish Migration Periods and/or other in-water work restrictions: Refer to the Project Special Provisions for specific restrictions.
- Working over Waterways Restricted Periods.
- Night-time paving and striping operations, traffic, and temperature restrictions.
- Utility Restrictions shall be as specified within the Contract.

J. FLOAT

For the calculation of float in the CPM schedule, the setting for *Retained Logic* is required for all schedule submissions, starting with the Baseline Schedule Submission. Should the Contractor have a reason to propose that an alternative calculation setting such as *Progress Override* be used, the Contractor shall obtain the Engineer's approval prior to modifying to this setting.

K. COST AND RESOURCE LOADING (Types A and B only)

For all Type A and B Schedules, the Contractor shall provide a cost and resource-loaded schedule with an accurate allocation of the costs and resources necessary to complete the Work. The costs and resources shall be assigned to all schedule activities in order to enable the Contractor to efficiently execute the Contract requirements and the Engineer to validate the original plan, monitor progress, provide cash flow projections, and analyze delays.

1. Each schedule activity shall have an assigned cost that accurately represents the value of the Work. Each schedule activity shall have its resources assigned to it by craft and the anticipated hours to accomplish the work. Each schedule activity's equipment resources shall be assigned to it by equipment type and hours operated. Front-loading or other unbalancing of the cost distribution will not be permitted.
2. The sum of the cost of all schedule activities shall be equal to the Contractor's Bid Price.
3. Indicating the labor hours per individual, per day, by craft and equipment hours/day will be acceptable.
4. The Engineer reserves the right to use the cost-loading as a means to resolve changes, disputes, time entitlement evaluations, increases or decreases in the scope of Work, unit price renegotiations and/or claims.
5. For all Type A and B Schedules, all subnets, fragnets, Proposal Schedules, and Recovery Schedules shall be cost and resource- loaded to help to quickly validate and monitor the duration of the Work to be performed.
6. For Type A Schedules, cost-loading of the schedule will also be used for cash flow projection purposes.
7. The cost-loading of each activity shall indicate the portion of the cost for that activity that is applicable to a specific bid item (cost account.) The total cost for each cost account must equal the bid item price.

SECTION 722 (Continued)

L. NOT TO BE USED IN THE CONTRACTOR'S CPM SCHEDULE

1. Milestones or constraint dates not specified in the Contract.
2. Scheduled work not required for the accomplishment of a Contract Milestone
3. Use of activity durations, logic ties and/or sequences deemed unreasonable by the Engineer.
4. Delayed starts of follow-on trades.
5. Float suppression techniques.
6. Leads such as leads, lags, SS, SF, & FF relationships without the expressed permission of the Department.

722.62 Submittal Requirements

All schedules shall be prepared and submitted in accordance with the requirements listed below.

Each monthly Contract Progress Schedule submittal shall be uniquely identified.

Each Submission shall, at a minimum, include the following:

a. Narrative
b. Schedule submittals shall be signed by the Scheduler
c. Schedule Printout - All Activities
d. Schedule Printout - Critical Path Layout
e. Schedule Printout - Remaining Work
f. Schedule Printout - Top 3 Float Path
g. Work Breakdown Structure (WBS) Summary
h. Project Spending Report (PSR) in Portable Document Format (.PDF)
i. Project Spending Report (PSR) in Microsoft Excel spreadsheet (.XLS)
j. Oracle Primavera P6 Schedule File (.XER)

All digital file submittals will be labeled with the following information.

- Contract Number
- Project Number
- Project locations (i.e., town(s))
- Brief description
- Submittal description (i.e., UP07)
- Data Date (MM-DD-YY)
- File Description (i.e., Critical Path)

Example: C110464 (P606309) - Orange Route 2 over 202 – UP23 (07-15-22) - Critical Path

A. Narratives

A written narrative shall be submitted with every schedule submittal. The narrative shall:

1. itemize and describe the flow of work for all activities on the Critical Path in a format that includes any changes made to the schedule since the previous Contract Progress Schedule / Monthly Update or the Baseline Schedule, whichever is most recent.
2. provide a description of any specification requirements that are not being followed. Identify those that are improvements and those that are not considered to be meeting the requirements.

SECTION 722 (Continued)

3. provide all references to any Notice of Delay that has been issued, within the time period of the Contract Progress Schedule Update, by letter to the Engineer. Note that any Notice of Delay that is not issued by letter will not be recognized by the Engineer. See Subsection 722.64.A – Notice of Delay.
4. provide a description of each third-party utility's planned vs. actual progress and note any that are trending late or are late per the durations and commitments as provided in the PUC Form; provide a description of the five (5) most important responses needed from the Department and the need date for the responses in order to maintain the current Schedule of Record.
5. provide a description of all critical issues that are not within the control of the Contractor or the Department (third party) and any impact they had or may have on the Critical Path.
6. provide a description of any possible considerations to improve the probability of completing the project early or on time.
7. compare Early and Late Dates for activities on the Critical Path and describe reasons for changes in the top three (3) most critical paths.
8. describe the Contractor's plan, approach, methodologies, and resources to be employed for completing the various operations and elements of the Work for the top three (3) most critical paths. For update schedules, describe and propose changes to those plans and verify that a Proposal Schedule is not required.
9. describe, in general, the need for shifts that are not 5 days/week, 8 hours/day, the holidays that are inserted into each calendar and a tabulation of each calendar that has been used in the schedule.
10. describe any out-of-sequence logic and provide an explanation of why each out-of-sequence activity does not require a correction, if one has not been provided, and an adequate demonstration that these changes represent the basis of how these activities will be built, including considerations for resources, dependencies, and previously approved production rates.
11. identify any possible duration increases resulting from actual or anticipated unit price item quantity overruns as compared to the baseline duration, with a corresponding suggestion to mitigate any possible delays to the Critical Path. If the delay is anticipated to impact the Critical Path, refer to Subsections 4.06 – Increased or Decreased Contract Quantities and 8.10 – Determination and Extension of Contract Time for Completion and submit a letter to the Engineer notifying of a potential delay.
12. include a schedule log consisting of the name of the schedule, the data date and the date submitted.
13. include and describe any notifications, communications and coordination meetings with third-parties such as utility companies that occurred from the last update including personnel names, job titles and contact information, date of meeting(s)/correspondence(s), topics discussed, and reasons the third party provided for deviations from the PUC form.

SECTION 722 (Continued)

B. CPM Bar Charts

One (1) timescaled bar chart containing all activities shall be prepared and submitted using a scale that yields readable plots and that meets the requirements of Subsection 722.61 – Schedule Content and Preparation Requirements Activities shall be linked by logic ties and shown on their Early Dates. Critical Paths shall be highlighted, and Total Float shall be shown for all activities.

A second timescaled bar chart shall also be prepared containing only the Critical Path or, if the Critical Path is not the longest path, the Longest Path using a scale that yields readable plots and that meets the requirements of Subsection 722.61 – Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Total Float shall be shown for all activities.

C. Detailed Activity Schedule Comparisons

A Detailed Activity Schedule Comparison (DASC) is a simple reporting tool in the format of a graphical report that will provide Resident Engineers with immediate, timely and up-to-date information. The DASC consists of an updated bar chart that overlays the current time period's bar chart onto the previous time period's bar chart for an easily read comparison of progress during the present and previous reporting periods.

D. Activity Cost Report and Monthly Cash Flow Projections (Type A only)

With each Contractor Quantity Estimate (CQE), the Contractor shall submit an Activity Cost Report and Cash Flow Projection that includes all activities grouped by Contract Bid Item.

The Activity Cost Report shall be generated from the Schedule of Record and shall be the basis of the Monthly Cash Flow Projection. Within each contract Bid Item, activities shall be sequenced by ascending activity identification number and shall show:

1. activity ID and description,
2. forecast start and finish dates for each activity and,
3. when submitted as a revised schedule, actual start, and finish dates for each completed activity.
4. any variance to the estimated contract quantity shall be shown.

E. Resource Graphs (Type A only)

Monthly and cumulative resource graphs for the remaining Contract period using the Early Dates and Late Dates in the Contract Progress Schedule shall be included as part of each schedule submittal.

SECTION 722 (Continued)

F. Projected Spending Reports

A Projected Spending Report (PSR) shall be prepared and submitted monthly. The PSR shall indicate the monthly spending (cash flow) projection for each month from NTP to Contractor Field Completion (CFC). Each month's actual spending shall be calculated using all CQEs paid during that month. The Projected Spending Report (PSR) shall be depicted in a tabular format and provided in both an .XLS and .PDF.

722.63. Progress Schedule Requirements

A. Baseline Schedule

The Baseline Schedule shall be due thirty (30) Calendar Days after Notice to Proceed (NTP). The Baseline Schedule shall only reflect the Work awarded to the Contractor and shall not include any additional work involving Extra Work Orders or any other type of alleged delay. The Baseline Schedule shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements. Once the Baseline Schedule has been accepted by the Engineer, with or without comments, it shall represent the as-planned schedule for the Work and become the Contract Progress Schedule of Record until such time as the schedule is updated or revised under Subsections 722.63.C - Contract Progress Schedules / Monthly Updates, 722.64.C - Recovery Schedules and 722.64.D - Proposal Schedules.

The Cost and Resource-Loading information (Types A and B only) shall be provided by the Contractor within forty-five (45) Calendar Days after NTP.

The Engineer's review comments on the Baseline Schedule and the Contractor's responses to them will be maintained for the duration of the Contract and will be used by the Engineer to monitor the Contractor's work progress by comparing it to the Contract Progress Schedule / Monthly Update.

B. Interim Progress-Only Schedule Submissions

The first monthly update of the Contract Progress Schedule/Monthly Update is due within seventy (70) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule review period ends at sixty (60) Calendar Days after NTP, see Subsection 722.60.B - Schedule Reviews by the Department. If the Baseline Schedule has not been accepted within sixty (60) Calendar Days after NTP, an Interim Progress-Only Schedule shall be due within seventy (70) Calendar Days after NTP. The purpose of the Interim Progress-Only Schedule is to document the actual progress of all activities, including non-construction activities, from NTP until the Baseline Schedule is accepted.

SECTION 722 (Continued)

C. Contract Progress Schedules / Monthly Updates

The first Contract Progress Schedule shall be submitted by the Contractor no later than seventy (70) Calendar Days after NTP. The data date for this first Progress Schedule shall be two months (approximately sixty (60) Calendar Days) after NTP. Subsequent Progress Schedules shall be submitted monthly.

Each Contract Progress Schedule shall reflect progress up to the data date. Updated progress shall be limited to asbuilt sequencing and asbuilt dates for completed and inprogress activities. Asbuilt data shall include actual start dates, remaining Work Days and actual finish dates for each activity, but shall not change any activity descriptions, the Original Durations, or the Original Resources (as planned at the time of bid), without the acceptance of the Engineer. If any activities have been completed out-of-sequence, the Contractor shall propose new logic ties for affected in-progress and future activities that accurately reflect the previously approved sequencing. Alternatively, the Contractor may submit to the Engineer for approval an explanation of why an out-of-sequence activity does not require a correction and an adequate demonstration that the changes accurately represent how the activities will be built, including considerations for resources, dependencies, and previously approved production rates. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

No revisions to logic ties, sequence, description, or duration of future activities; or planned resource costs shall be made without prior approval by the Engineer.

Any proposed logic changes for in-progress or future activities shall be submitted to the Engineer for approval before being incorporated into a Contract Progress Schedule. The logic changes must be submitted using a Proposal Schedule or a schedule fragnet submission. Once approved by the Engineer, the Contractor may incorporate the logic in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

For any proposed changes to the original sequence, description or duration of future activities, the Contractor shall submit to the Engineer for approval an explanation of how the proposed description or duration change reflects how the activity will be progressed, including considerations for resources and previously approved production rates. Any description or duration change that does not accurately reflect how the activity will be progressed will not be approved by the Engineer. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

Contract Progress Schedules that extend performance beyond the Contract Time or beyond any Contract Milestone shall not be approved by the Engineer. The Contractor shall submit a Recovery Schedule, or a Time Entitlement Analysis, if any Contract Progress Schedule/Monthly Update indicates a failure to meet the Contract Dates.

SECTION 722 (Continued)

D. Short-Term Construction Schedule

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a spreadsheet format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule and may be at a greater level of detail. The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work for the two (2) week period prior and all planned work for the following three (3) week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities. Short-Term Construction Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements.

722.64 Impacted Schedule Requirements

A. Notice of Delay

The Contractor shall notify the Engineer in writing, with copies to the District and State Construction Engineers, within fifteen (15) of the start of any delays to the Critical Path that are caused by actions or inactions that were not within the control of the Contractor. Delay notifications that are not provided in a letter to the Engineer, such as a delay notification in the schedule narrative, will not be recognized as contractual notice in the determination of any Time Extension related to the impacts to the work associated with this specific alleged delay. Should such a delay continue for more than one (1) week, the Contractor shall note it in the Schedule Narrative until the delay is no longer impacting the Critical Path for the completion of the Contract Milestones. The Engineer will evaluate the alleged delay and its impact and will respond to the Contractor within ten (10) Calendar Days after receipt of a notice of delay.

B. Time Entitlement Analysis

A Time Entitlement Analysis (TEA) shall consist of a descriptive narrative, prepared in accordance with Subsection 722.62.A - Narratives, and an as-built CPM schedule, which may be in the form of a schedule fragnet that has been developed from the project's Contract Progress Schedule of Record, and illustrates the impact of a delay to the Critical Path, Contract Milestones and/or Contract Completion Date as required in Subsection 8.10 - Determination and Extension of Contract Time for Completion. TEAs shall also be used to determine the schedule impact of proposed Extra Work Orders (EWO) as also required in Subsection 8.10.

TEAs shall be prepared and submitted in accordance with the requirements of Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements and shall be based on the Contract Progress Schedule of Record applicable at the start of the delay or impact from an EWO. A TEA fragnet must start with a specific new activity describing the work contained in either a Notice of Delay previously submitted to the Department per Subsection 722.64.A - Notice of Delay or an EWO.

SECTION 722 (Continued)

TEAs shall be submitted:

1. as part of any Extra Work Order that may impact Contract Time,
2. with a request for a Time Extension,
3. within fifteen (15) Calendar Days after a request for a TEA by the Engineer for any other reason.

A TEA shall be submitted to the Engineer before any Time Extension is granted to the Contractor. Time Extensions will not be granted unless the TEA accurately reflects an evaluation of all past delays and the actual events that occurred that impacted the Critical Path. The TEA must also demonstrate a plan for the efficient completion of all of the remaining work through an optimized CPM Schedule. The analysis shall include all delays, including Contractor-caused delays, and shall be subdivided into timeframes and causes of delays.

TEAs shall incorporate any proposed activities, logic ties, resource considerations, and activity costs required to demonstrate the schedule impacts most efficiently in addition to detailing all impacts to existing activities, logic ties, the Critical Path, Contract Milestones, and the Contract Completion Date. In addition, TEAs shall accurately reflect any changes made to activities, logic ties, restraints, and activity costs, necessitated by an Extra Work Order or other schedule impact, for the completion of the remaining work. The Contractor shall provide TEAs that demonstrate that all delays have been mitigated to the fullest extent possible without requiring an Equitable Adjustment to the original bid basis.

All TEAs shall clearly indicate any overtime hours, additional shifts and the resources that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts. The Engineer shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions if it is determined to be in the best interest of the Department to do so.

When accepted, the changes included in a TEA shall be incorporated into the next Contract Progress Schedule per the requirements of Subsection 722.63.C - Contract Progress Schedules / Monthly Updates. During the review of any TEA, all Contract Progress Schedules shall continue to be submitted as required.

The Engineer may request that the Contractor prepare a Proposal Schedule or a Recovery Schedule to further mitigate any delays that are shown in the accepted TEA or Contract Progress Schedule.

C. Recovery Schedules

The Contractor shall promptly report to the Engineer all schedule delays during the prosecution of the Work. Contract Progress Schedules that predict performance extended beyond the Contract Time or beyond any Contract Milestone shall not be approved as the schedule of record. This requirement is critical to the Department's ability to make informed decisions regarding Contract Time and costs.

The Contractor shall submit a Recovery Schedule within fifteen (15) Calendar Days of a Contract Progress Schedule submission that shows failure to meet the Contract Dates unless a recovery schedule is waived by the Department. Waiving the recovery schedule does not relieve the Contractor of the responsibility for the delay. The Department may revoke the waiver of a Recovery Schedule, at which time a Recovery Schedule shall be submitted within fifteen (15) Calendar Days of the Contractor being notified.

Changes represented in accepted Recovery Schedules shall be incorporated into the next Contract Progress Schedule.

SECTION 722 (Continued)

D. Proposal Schedules

A Proposal Schedule is an alternative schedule used to evaluate proposed changes to the Contract scope or significant alternatives to previously approved approaches to complete the Work, which may include changes to activity durations, logic, and sequence. For Types A and B Schedules, the Proposal Schedule shall be cost and resource loaded.

A Proposal Schedule may be requested by the Department at any time or may be offered by the Contractor. The Engineer may request that the Contractor prepare a Proposal Schedule to further mitigate any delays that are shown in an accepted TEA or Contract Progress Schedule.

The Contractor shall submit the Proposal Schedule within thirty (30) Calendar Days of a request from the Department.

The Proposal Schedule shall not be considered a Schedule of Record until the logic, durations, narrative, and basis of the Proposal Schedule have been accepted by the Engineer. If the Proposal Schedule took the form of a fragnet, it must be incorporated into the Contract Progress Schedule of Record showing the current progress of all other activities and the impacts/results of the changes made by the Proposal Schedule before the Proposal Schedule is accepted by the Department.

Proposal Schedules shall clearly indicate any proposed acceleration including overtime hours, additional shifts, and the resources that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts. Proposal Schedules that contain a cost element shall be submitted with a separate Cost Proposal.

Changes represented in the accepted Proposal Schedules shall be incorporated into the next Contract Progress Schedule. During the review of any Proposal Schedule, all Contract Progress Schedules shall continue to be required every month.

E. Disputes

All schedules shall be submitted, reviewed, dispositioned, and accepted in the timely manner specified herein so as to provide the greatest possible benefit to the execution of this Contract.

The Contractor may dispute a decision by the Engineer by filing a claim notice within seven (7) days after the Contractor's request for additional time has been denied or if the Contractor does not accept the number of days granted in a time extension. The Contractor's claim notice shall include a revised time entitlement analysis that sufficiently explains the basis of the time-related claim. Failure to submit the required time entitlement analysis with the claim notice shall result in denial of the Contractor's claim. A determination on the Contractor’s claim shall be in accordance with Subsection 7.16 Claims of Contractor for Compensation. Pending resolution of any dispute, the last schedule accepted by the Engineer will remain the Contract Schedule of Record.

SECTION 722 (Continued)

722.65 Schedule Type D Requirements

This section is to detail the requirements for Type D Schedules and is separate from the requirements listed above. These schedules are intended for a project in which a more formal schedule would not be practical.

Schedules for Type D projects shall be submitted for each work assignment. The Schedule Type D shall be submitted electronically in .XLS and .PDF format and meet the following requirements.

The schedule requirements for work assignments that are anticipated to last three weeks or less shall conform to the requirements for Short-term Construction Schedules below.

Work assignments that are anticipated to last longer than three weeks shall submit a bar chart baseline and provided update schedules upon request of the engineer as required under Bar Chart Schedule below in addition to meeting the Short-term Construction schedule requirements.

A. Bar Chart Schedule

A Bar Chart that shall include the following:

- Work Assignment start date.
- Activities to identify.
  - Major work operations broken down to be no longer than 14 days.
  - Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before procuring and fabricating.
  - The preparation and submission of shop drawings, procedures, and other required submittals, with a planned duration that is to be demonstrated to the Engineer as reasonable.
  - The review and return of shop drawings, procedures, and other required submittals, approved or with comments, the duration of which shall be shown as thirty (30) Calendar Days,
  - Detailed activities to satisfy permit requirements.
  - Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
  - Project Close out activities including a 21-calendar day creation of a punchlist activity and 30 calendar day minimum completion of punchlist activity.
- Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third-party work affecting the Contract.
- Access Restraints – restrictions on access to areas of the Work
- Traffic work zone set-up and removal, night work and phasing
- Contract Milestones including Full beneficial Use, Substantial Completion and Contractor Field Completion

The Bar Char Schedule shall be provided at the beginning of the project and updated with each work order created for the project.

SECTION 722 (Continued)

B. **Short-Term Construction Schedule**

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a spreadsheet format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule and may be at a greater level of detail. See schedule toolkit for suggested format.

The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work on the assignment for the two week period prior and all planned work for the following three week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities.

C. **Project Spending Report (PSR)**

A Projected Spending Report (PSR) shall be prepared and submitted monthly. The PSR shall be for all active work assignments, broken down by work assignment. The PSR shall indicate the monthly spending (cash flow) projection for each month from NTP to Contractor Field Completion (CFC). Each month's actual spending shall be calculated using all CQEs paid during that month. The Projected Spending Report (PSR) shall be depicted in a tabular format and provided in both an .XLS and .PDF

SECTION 722 (Continued)

COMPENSATION

722.80 Method of Measurement

Schedule of Operations (Type A, B and C)

The project bid documents specify the fixed-price amounts to be paid to the Contractor for the Project Schedule requirements contained herein. Each bidder shall include this fixed price bid item amounts in their bid. Failure to do so may be grounds for the rejection of the bid.

This fixed price amount is for payment purposes only and is separate from what the Department considers to be the Contractor's General Condition costs. If the Contractor deems it necessary to include additional costs to provide all of the requirements of this section, these additional costs shall be included in the Contractor's overall bid price.

All required schedule-related work, including, but not limited to computers, computer software, the planning and coordination with utilities, training, schedule preparation and schedule submittals will be paid for under the fixed price amount.

Twenty percent (20%) of this pay item will be paid upon the Engineer's acceptance of the Contractor's Baseline Schedule, prepared and submitted in accordance with Subsection 722.63.A.

The remaining eighty percent (80%) of this pay item will be paid in equal monthly installments distributed across the Contract Duration from Notice to Proceed (NTP) to Contractor Field Completion (CFC), less the 2 months required for the submittal and review of the Baseline Schedule in accordance with the following formula:

$$\text{Monthly Payment} = \frac{\text{Remaining Fixed Price amount (80\% of the Item Cost.)}}{\text{Contract Duration in whole months} - 2 \text{ months}}$$

The Schedule of Operations pay item will be adjusted to pay for only the actual quantity of schedules that have been submitted in accordance with this section.

Should there be a Time Extension granted to the Contractor, the Engineer may provide an Equitable Adjustment for additional Contract Progress Schedule Updates at intervals directed by the Engineer. The monthly payment will be the basis for this Equitable Adjustment.

Schedule of Operations (Type D)

For projects assigned with Type D schedule requirements, all scheduling work shall be considered incidental to the project with no separate payment under this section.

SECTION 722 (Continued)

722.81 Basis of Payment

The timely and accurate submission of the Baseline Schedule is critical to the Contract and the Department's ability to make informed decisions. Only payments under Item 740 - Engineer's Field Office and Item 748 – Mobilization will be made until the Baseline Schedule is accepted by the Engineer.

All required schedule-related work, including, but not limited to computers, computer software, the planning and coordination with utilities, training, schedule preparation and schedule submittals (including monthly progress schedules, short-term schedules, project spending reports, TEAs, recovery schedules or impacted schedules) shall be included in this work.

No payment for any other pay item will be processed beyond seventy-five (75) Calendar Days from Notice to Proceed (NTP) until the Baseline Schedule is accepted by the Engineer. Until the Engineer's acceptance of the Baseline Schedule, the combined total of all payments made to the Contractor will be limited to an amount no greater than the total price for Item 748 - Mobilization or 3% of the contract price, whichever is less.

All Contract Progress Schedule Updates submitted later than ten (10) Calendar Days after the CQE (Contract Quantity Estimate) completion date, or greater than forty (40) Calendar Days from the Data Date of the previous submission, will be deemed to be no longer useful and will not qualify for payment. The late submission of Impacted schedules, including TEAs, recovery schedules and proposal schedules will result in the forfeiture of the monthly payment for the month in which they were due and subsequent months until the submission is made. Late submission of missed submittals will not result in recovery of the previously forfeited portion of the Schedule of Operations Fixed Price Payment Item.

Failure to submit schedules as and when required may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

Failure to submit schedules that are acceptable to the Engineer may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

The Schedule of Operations pay item will be adjusted to pay for only the actual quantity of schedules that have been submitted in accordance with this section.

The Contractor's failure or refusal to comply with the requirements of this Section shall be reasonable evidence that the Contractor is not prosecuting the Work with due diligence and may result in the Engineer withholding of full or partial payments of all work performed.

722.82 Payment Items

722.1	SCHEDULE OF OPERATIONS (TYPE A) - FIXED PRICE $_____	LUMP SUM
722.2	SCHEDULE OF OPERATIONS (TYPE B) - FIXED PRICE $_____	LUMP SUM
722.3	SCHEDULE OF OPERATIONS (TYPE C) - FIXED PRICE $_____	LUMP SUM

ITEM 100.91 PRECONSTRUCTION SURVEY AND MONITORING OF EXISTING STRUCTURES LUMP SUM

The work shall include all materials, labor, equipment, and professional services required to conduct pre- and post-construction and railroad condition surveys, vibration monitoring of existing buildings, and deformation monitoring of the existing structures to ensure they remain undamaged during construction activities. At a minimum, the Contractor shall implement the following measures:

- Pre-/Post-Construction and Railroad Condition Surveys: Performance of surveys documenting the pre- and post-construction site conditions, including a condition survey of the existing abutments, retaining walls, existing building adjacent to Wall 7, railroad and sewer lines prior to the commencement of work and upon completion of work.

- Vibration Monitoring of Existing Buildings and Utilities: Work includes the performance of vibration monitoring of background and construction activities at the existing buildings adjacent to Wall 7 and the 55" brick sewer, and preparation of daily and summary reports of vibration readings.

- Deformation Monitoring: Work includes the installation and monitoring of deformation monitoring points to observe possible movement and/or damage at the existing abutments, retaining walls, existing building adjacent to Wall 7, support of excavation, existing utilities and railroad during construction activities, and preparation of summary reports of the deformation monitoring readings.

For more information, refer to the following sections.

For all work related to the 55" brick sewer parallel to the CSX Mainline, the Contractor shall coordinate with the Springfield Water and Sewer Commission (SWSC) to establish a work schedule that allows SWSC to have their own personnel on site when the work is conducted. Means and methods for the conduct of the work shall be subject to SWSC review.

The existing sewer is located, in part, within railroad right of way. As such, the Contractor will be required to obtain an access permit from the operating railroad prior to initiating work.

ITEM 100.91 (Continued)

CONSTRUCTION METHODS

Pre- and Post-Construction and Railroad Condition Surveys:

The purpose of the pre-construction inspection is to establish the baseline physical condition of the existing features before any work that produces vibration begins on the project. The post-construction inspection shall be conducted in the same manner as the pre-construction inspection after all work that produces vibration has been completed for the purpose of establishing if any damage was sustained during the intervening period of construction.

The Contractor shall retain a Professional Engineer registered in the Commonwealth of Massachusetts to conduct pre-construction and railroad condition surveying services. The existing conditions of all structures to remain within 50 feet of the proposed work associated with the construction of the proposed bridge abutments, wall extensions/crash walls, gravity blocks, and retaining walls shall be documented. At a minimum, the following existing structures that will remain shall be surveyed and documented prior to construction:

- Bridge abutments,
- Retaining walls,
- Building structure along Armory Street (i.e. 1-story brick building adjacent to Wall 7),
- 30-inch sewer pipes at Armory Street over CSX Mainline,
- 55-inch sewer pipe parallel to the CSX Mainline, and
- Railroad tracks, ballast, and associated, accessible railroad utilities/structures.

At a minimum, post-construction surveys shall also be performed at the existing building adjacent to Wall 7, the sewer lines (including the 55” existing brick sewer), as well as the existing railroad.

A pre-construction survey of the 55-inch sewer pipe parallel to the CSX Mainline performed during design is provided for informational purposes only and to be used by the Contractor at their own risk (see Document A00887). The Contractor may request this survey from MassDOT.

Information obtained by the Contractor shall include, but not be limited to, the following:

- Photographic and videotape documentation of the pre- and/or post-construction conditions.

- The extent and location of existing signs of distress such as cracking, spalling, and visual evidence of settlement.

- Closed-circuit television videos (CCTV) of proposed (completed under this contract) sewer lines, including the existing 55” sewer.

The Contractor may accompany the Engineer on each condition survey for verification of the recorded data.

ITEM 100.91 (Continued)

The Contractor shall provide CCTV condition assessments pre-and post construction using a robotic crawler or floating color CCTV system for the full length of the project limits including along the face of the existing bridge abutment. The Contractor shall use a color pan and tilt or a side wall scanning (panoramic) camera specifically designed and constructed for sewer inspection. Lighting for the camera shall provide a clear picture of the entire periphery of the sewer. The equipment shall include a geolocation device that can be detected from the surface to locate the CCTV system. The CCTV condition assessment report shall be coded using the current NASSCO PACP standards. A PACP certified operator shall be present during the entire survey. The Contractor shall provide proof of certification prior to commencement of the work. The condition assessments shall be delivered in electronic format. The Contractor is required to conduct the post-construction inspection assessment as a comparison to the pre-construction assessment, with references to the same locations and differences in condition noted at those locations. If no differences in condition are assessed at these locations, the post-construction assessment shall so note. No points within the sewer that were originally assessed during the pre-condition inspection shall be missing a post-construction assessment. The Contractor shall anticipate that flow will be maintained in the sewer during the inspections.

Vibration Monitoring of Existing Building and Sewer:

The Contractor shall retain an experienced vibration monitoring consultant to measure peak particle velocities prior to, and during construction operations at a minimum at the existing 1-story brick building adjacent to Wall 7 and the 55" sewer parallel to the CSX Mainline. Vibration monitoring shall be performed during demolition, foundation and soldier pile & lagging wall construction performed within 50 feet of the existing building or sewer.

The Contractor shall provide a 3-component seismograph, with the following minimum features:

- Seismic range: 0.01 to 4 inches per second with an accuracy of +/- 5 percent of the measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inches per second or less.

- Three channels for vibration monitoring.

- Two power sources: internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for up to 24 hours.

- Instruments must be capable of producing strip chart recordings and readings on site within one hour of obtaining readings. Provide computer software to perform analysis, produce reports of continuous monitoring.

- Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of one minute or less.

ITEM 100.91 (Continued)

The Contractor shall operate the seismograph for a minimum of 5 consecutive 24-hour periods prior to the start of construction to establish baseline levels.

Following the start of construction, the Contractor shall monitor the vibration levels on an ongoing basis during the construction activities identified in the Vibration Monitoring Plan, or as required by the Engineer. The Contractor shall maintain records of the vibration levels and shall submit a report of these levels as requested by the Engineer. The threshold value for peak particle velocity vibration criteria shall be 12.7 millimeters per second (1/2-inch per second). If measurements exceed the threshold value, the following actions shall be taken:

1. Verify measurement reading
2. Double the frequency of readings
3. Notify the Engineer. Hold a meeting with representatives of the Contractor and MassDOT. Ensure work is being performed in accordance with the Contract Documents. Meeting to be held within 48 hours of exceeding the threshold value.

The limiting value for peak particle velocity vibration criteria shall be 25.4 millimeters per second (1-inch per second).

If measurements exceed the limiting value, the following actions shall be taken:

1. Stop construction operations immediately
2. Verify measurement reading
3. Notify the Engineer and hold a meeting with representatives of the Contractor and MassDOT immediately
4. Inspect the buildings for any visible change in condition

Based on the level of damage identified, follow the directions outlined below:

a. No Damage to Slight damage (as defined by Boscardin and Cording, 1989); Proceed with construction operations while monitoring the condition of the buildings. Monitoring shall be continuous during the hours that construction operations are being performed. If damage is noted to reach the Moderate level (as defined by Boscardin and Cording) during the monitoring, stop construction activity and proceed to b.
b. Moderate to severe damage (as defined by Boscardin and Cording); Install preventative measures to prevent further damage before proceeding with construction activity. Preventative measures may include supplementary support/stabilization. The Contractor, MassDOT, and Engineer must all approve the proposed additional measure before the measure is implemented. Once the measure is implemented, proceed with construction operations while monitoring the condition of the structure. Monitoring shall be continuous during the hours that construction activity is being performed. If additional damage is noted, stop construction activity, and repeat the above procedure relative to additional preventative measures.

ITEM 100.91 (Continued)

During all monitoring of vibration-producing construction activities the Contractor shall document all events that are responsible for the measured vibration levels and submit the documentation to the Engineer with the data.

Deformation Monitoring of Existing Abutments, Retaining Walls, Building and Railroad:

The Contractor shall retain a Geotechnical Instrumentation & Monitoring consultant to prepare an Instrumentation and Monitoring Plan, and install, monitor, maintain, and report on the monitoring points. This proposed consultant must be pre-approved by the Engineer. The consultant shall have demonstrated experience of performing the work and shall provide reference to at least three (3) similar past projects.

At a minimum, deformation monitoring points should be installed and monitored at the following structures:

- Portions of existing bridge abutments that remain (4 in total),
- Counterfort wall along Albany Street,
- Existing masonry block Wall 7 along Armory Street,
- Existing brick building adjacent to Wall 7,
- Existing railroad tracks within 100 feet of the existing bridge.

The monitoring points shall consist of anchor bolts and/or round head bolts or equivalent and be affixed to the face and/or top of the abutments and existing retaining walls. Monitoring points at the railroad tracks shall be clearly observable points marked on the top horizontal surface of the rail as approved by CSX. The points shall be marked approximately every 50 feet within approximately 100 feet of the existing bridge abutments. The points shall be clearly identified using fluorescent spray paint adjacent to the point.

Monitoring points shall be used to measure horizontal and vertical displacements of these points during the construction of the proposed bridge replacements including excavation, installation of excavation support system, micropile installation, and backfilling. Monitoring points shall also be measured during the construction of soldier pile & lagging walls that are within 25 feet of the structures to be monitored as listed above.

Monitoring frequency on the existing railroad shall be daily during excavation and demolition operations. Monitoring frequency shall otherwise be twice per week. The accuracy of the monitoring data points shall be kept to the nearest 0.01 ft.

The following “threshold” and “limiting” movements of existing structures shall be as follows:

- “Threshold” Horizontal Movement: No greater than 0.25 inch.
- “Limiting” Horizontal Movement: No greater than .5 inch.

ITEM 100.91 (Continued)

The Contractor or Geotechnical Instrumentation & Monitoring consultant shall immediately notify the Engineer and shall take immediate steps to control further movement by revising construction procedures, providing supplemental bracing, backfilling or other measures as required if any of the following occur:

1. Field measurements indicate that any of the "threshold" movement criteria are reached or exceeded.

2. Field measurements or observations indicate that significant or sustained abutment or wall.

3. Movements, beyond those reasonably expected, are occurring (total movement may be less than the "limiting" movement criteria.)

If "limiting" movements are being approached or reached, the Engineer may require the Contractor to temporarily suspend the work in the area where such movement is occurring and implement all necessary mitigation measures which are acceptable to the Engineer, to arrest the movements, at no additional cost.

Work in the area where the "limiting" values have been reached shall not be permitted until the results of surveys can be reviewed and evaluated by the Engineer. This criterion is intended to establish a minimum basis for the Contractor's design and procedures and do not relieve the Contractor of its responsibility for preventing detrimental movements and damage to adjacent structures, utilities, or other work. In the event the Contractor does not comply with the approved mitigation plan or continues work in violation of "threshold" or "limiting" values being reached or exceeded, the Contractor shall not be allowed to continue work until proper mitigation procedures and corrections have been made as determined by the Engineer. No claims for schedule delays will be allowed due to the Contractor's failure to comply with these requirements.

SUBMITTALS

Qualifications

The Contractor shall submit to the Engineer for approval the following confirmation regarding the qualifications of the firm and personnel conducting the work. The firm conducting the inspections and assessments must have a minimum of five year's experience conducting the work described herein. The onsite personnel conducting the inspections and assessments must each have at least three year's experience conducting such work. The Contractor shall provide the names, titles, phone numbers and addresses of at least two references that can be used to verify this experience. The Contractor shall provide five similar projects with inspection equipment and assessments as proposed for this project.

ITEM 100.91 (Continued)

Pre- and Post-Construction and Railroad Condition Surveys:

The Contractor shall submit the obtained documentations during the surveys including, but not be limited to, the following:

- Photographic and videotape documentation of the pre- and post-construction conditions.
- Closed-circuit television videos (CCTV) of proposed sewer lines (including the existing 55" brick sewer).

Vibration Monitoring:

The Contractor shall submit a written Vibration Monitoring Plan to the Engineer for approval a minimum of 2 weeks prior to the commencement of the baseline monitoring period. Firm and individual qualifications of the vibration monitoring consultant shall be submitted to the Engineer for approval.

The Vibration Monitoring Plan shall include the necessary information to outline the recording collection and shall specifically include, but not be limited to, the following:

1. Contract Designations

    a. The name of vibration monitoring specialist(s).
    b. The scheduled start date and length of construction operations which require vibration monitoring including but not limited to excavation, driving or vibrating of excavation support system, pile installation, backfill, or other activities as required by the Engineer.
    c. The limits of vibration monitoring work.
    d. The location of all structures to be monitored in proximity to the construction operation.
    e. The location of any underground utilities in proximity to the construction operation.

2. Experience and Equipment

    a. Submit proof and details, as references, of two projects in the past five years where the vibration monitoring consultant performing the work has satisfactorily monitored construction operations by recording maximum peak particle velocities (PPVs). Include contact information for each reference.
    b. Submit information on the required 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer's name, model number, and documentation of factory calibration performed within the last 12 months.

ITEM 100.91 (Continued)

3. Methods and Procedures

    a. The location of adjacent structures to be monitored and maximum allowable PPV. If not otherwise specified, a maximum allowable PPV in accordance with the United States Bureau of Mines (USBM) Vibration Criteria shall be observed at all structures.
    b. The location of seismograph(s) placements, as directed by the Contractor's Professional Engineer. Recording seismographs may be installed on selected structures.
    c. Appropriate details for anchoring the geophone(s).
    d. The procedure for tracking PPV throughout construction operations (e.g., drilled micropile: drilled pile depth vs. vibrations may be correlated through time of day. A record of the time of day at each depth interval, included on the pile installation records, would be required to correlate to a time-based readout of PPV).

Certification shall be provided to indicate that the test equipment used for this purpose is calibrated and maintained in accordance with the test equipment manufacturer's calibration requirements and that, where applicable, calibrations are traceable to the National Institute of Standards and Technology (NIST).

The Contractor shall submit a report summarizing the recorded baseline levels to the Engineer a minimum of 5 days prior to the start of construction.

The Contractor shall maintain records of the vibration levels and shall submit summary reports of these levels to the Engineer within 4 weeks after completing the construction activities that could create vibrations.

Deformation Monitoring:

Prior to installation of the monitoring equipment, the Contractor shall submit for approval to the Engineer an Instrumentation and Monitoring Plan outlining the proposed monitoring point locations, procedures including reading frequencies, and information regarding all equipment used. The plan shall be submitted at least 2 weeks prior to the start of the monitoring point installation and baseline monitoring period. As part of this submittal, a mitigation plan shall be provided to indicate the Contractor's course of action in the event that any of the established criteria are exceeded. The Contractor shall provide the Engineer the baseline readings report at least 3 days prior to starting any intrusive construction activities.

Subsequent monitoring deformation readings shall be provided to the Engineer as a weekly summary reports prior to commencing work on the 2nd day following the week the readings were taken (i.e., readings for Monday through Friday of a week need to be submitted by the following Tuesday prior to commencing work).

ITEM 100.91 (Continued)

BASIS OF PAYMENT

Item 100.91 will be paid for at the Contract lump sum bid price, which price shall include full compensation for all labor, materials, equipment, transportation, disposal fees necessary, professional services, the collection and processing of all data and reporting, submittals, and incidental costs required to complete the work.

If damage occurs to existing structures or utilities because thresholds of vibration are exceeded, the costs of repair are borne by the Contractor at no additional compensation.

ITEM 112.1 DEMOLITION OF BUILDING NO. 1 LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsection 112 of the Standard Specifications and the following:

The work under this Item consists of demolition of Building No. 1 at 176 Armory Street.

Work under this item shall commence as soon as possible following Notice to Proceed to enable Contractor use of the site and to facilitate work site access.

A pre-demolition hazmat survey of the building has been completed and a report of the findings is provided under Document A00882.

Foundations, cellar floors and walls shall be removed to a depth of not less than 1 ft below proposed grade as shown on the Curb Tie and Grading Plans. Acceptable fill material shall likewise be placed to not less than 1 ft below proposed grade. The depth of building removal and grading of fill shall account for the placement of 1 ft ordinary borrow and 4 inches loam as noted on the plans.

ITEM 114.1	**DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. S-24-016**	**LUMP SUM**
ITEM 114.2	**DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. S-24-026**	**LUMP SUM**

The work to be done under these Items shall conform to the relevant provisions of Subsection 112 of the Standard Specifications and the following:

The work to be done under these Items includes furnishing all labor and materials necessary to perform demolition of the entire bridge superstructure as shown on the plans. The demolition of the superstructure includes, but is not limited to, removal and disposal of asphalt pavement on the bridge, sawcutting removal of the reinforced concrete slab, steel framing members, bridge railings, bearings, and any part of the bridge above the beam seats.

The Contractor shall protect the CSX active rail line from falling debris during demolition activities and shall provide shielding, tarps, etc. as necessary to perform the work. Temporary Protective Shielding shall be used in conjunction with this demolition as specified and paid for separately under Items 994.1. The Contractor shall submit procedures for setup and securement of equipment such as drill rigs and cranes with potential to foul tracks that will include predefined precautions such as including swing-limiting controls, oversizing matting and dunnage for supporting equipment, etc.

Removal of the substructure elements designated to be removed, as shown on the plans and to the limits noted on the plans, will be paid for separately. Demolition of reinforced concrete will be paid for under Item 127.1, Reinforced Concrete Excavation and demolition of granite blocks will be paid for Item 144. Class B Rock Excavation.

All materials removed under these demolition Items shall become the property of the Contractor and shall be recycled, reused, or disposed of in accordance with all applicable Local, State, and Federal requirements.

There are existing utilities in the majority of bays of both bridges. See the utility plans and construction staging cross-sections for utility related work that must be accomodated during demolition operations. The Contractor shall take all necessary precautions to protect existing utilities scheduled to be held in place. The Contractor shall coordinate all demolition activities with the applicable utility companies prior to performing the work.

The Contractor shall perform sufficient deck removal to facilitate the utility work. The Contractor is responsible for the installation (and removal) of the temporary utility support structures which hold the existing utilities in place from above. The Contractor shall provide for any required shielding or containment for the private utilitiy company to perform their work.

Due to the nature of the proposed demolition work, the CSX active rail and the existing utilities, the Contractor shall anticipate extensive coordination and communication with the private utility companies, MassDOT, and CSX.

The Plans reflect that the demolition work will be phased. One lane of vehicular traffic and pedestrian accomodation must be maintained at all times.

ITEMS 114.1 and 114.2 (Continued)

SUBMITTALS

Prior to the start of work, the Contractor shall submit Demolition Plans and Calculations for review and approval by the Engineer. The Demolition Plans and Calculations should be designed and stamped by a Professional Structural Engineer registered in the Commonwealth of Massachusetts. The Contractor shall indicate his/her proposed methods of demolition and removal with a sequence and schedule of operations, and indicating demolition equipment, tools, devices, protection methods, etc.. The plans shall conform to the same requirements as steel erection submittals, listed under Subsection 960 of the Standard Specifications. The plans should indicate the type, size, and dimensions of all materials and equipment to be used for the temporary supports false work, and protective shielding / debris containment systems. The Contractor shall submit a plan showing crane set-up locations, operating radii and heights, crane capacity, loads, lifting hardware, etc. for approval by the Engineer. No work shall commence until the Engineer has given written approval of the method of demolition and the proposed protective shielding / debris containment system. The demolition procedure and any necessary calculations and drawings shall bear the stamp of a Professional Engineer Registered in the Commonwealth of Massachusetts certifying that all existing structural members are suitably braced and supported throughout the demolition process. Work shall not commence until the Engineer has given written approval of the method of demolition.

MassDOT does not guarantee or represent that the bridge materials will actually coincide with any descriptions contained herein or represented on the Plans. The Contractor must satisfy them self by their own investigation and research regarding all conditions and materials affecting the work to be done. No additional compensation, other than the Lump Sum Price Bid for this Item, shall be made if the materials or work proves to be different from that inferred or described herein, or shown on any Plans. Plans of the existing structure are limited and do not define the extent of all work required.

The Contractor will make their own investigation of the structure to be demolished including the materials that are part of or may be stored in the structure. No increase will be made to the bid price due to the nature of the materials involved in the demolition. All costs for permits, dump fees, taxes, special handling of hazardous materials, etcetera, shall be included in the bid price of the demolition item.

The Contractor shall install a proper shielding and/or tarpaulins under all lead-paint-coated surfaces to be shear cut or bolts or rivets ordered removed in order to catch any loose lead paint chips, dust or particles.

BASIS FOR PAYMENT

Items 114.1 and 114.2 will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, professional engineering costs, necessary submittals, and all incidental costs required to complete the work.

Temporary Protective Shielding will be paid for under Items 994.01.

ITEM 127. CONCRETE EXCAVATION CUBIC YARD

The work under this item shall conform to the relevant provisions of Subsection 120 of the Standard Specifications and the following.

The work under this item includes the removal and disposal of subsurface concrete utility duct banks. Removal of the concrete shall be conducted in staged sequence in accordance with the approved project construction schedule. The presence of asbestos in the concrete duct banks could not be ascertained from the utility companies. Consequently, the Contractor shall obtain representative samples of non-plastic conduits within the concrete duct banks to be removed and test the samples under Item 182.1 to establish the presence and extent of asbestos. The Contractor shall establish the limits of the asbestos under Item 182.1 and remove that length of concrete duct bank under Item 182.2. All other concrete encased duct bank shall be removed and disposed under this item.

METHOD OF MEASUREMENT

Item 127. will be measured for payment by the Cubic Yard of concrete excavated. Measurements will be taken along the duct bank by its undisturbed outside section dimensions, with no deduction for the area of the conduits.

BASIS OF PAYMENT

Item 127. will be paid at the contract unit price per Cubic Yard, which price shall be full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for excavation to expose the duct banks for removal, backfill, compaction, and all other ancillary work to restore the roadway, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 127.1 REINFORCED CONCRETE EXCAVATION CUBIC YARD

The work under this item shall conform to the applicable provisions of Subsections 120 and 140 of the Standard Specifications.

The work includes furnishing all labor and equipment necessary to perform the demolition and proper disposal of the upper portions of the existing concrete abutment bridge seats and backwalls to faciliate the proposed "slab-over" details; and demolition of concrete portions of retaining walls as detailed on the Plans.

Prior to the start of work, the Contractor shall locate all utilities and coordinate with CSX as required by and paid for under Item 114.1 and Item 114.2.

Prior to concrete excavation, a vertical ¾" deep groove shall be sawcut at the limits shown on the plans. Concrete may be excavated by means of pneumatic hammers approved by the Engineer. Excavation shall not be undertaken until the limits have been defined by sawcutting.

The Contractor shall not damage the portions of existing structures to remain. Any areas damaged as a result of the Contractor's operations shall be repaired as required by the Engineer, and at the Contractor's expense.

After the existing concrete has been removed, all exposed surfaces shall be cleaned of all loose particles and loose rust by wire brushing, or other approved means, prior to placing the new concrete.

METHOD OF MEASUREMENT

Item 127.1 will be measured for payment by the Cublic Yard of reinforced concrete excavation to the limits shown on the plans, and as required by the Engineer.

BASIS OF PAYMENT

Item 127.1 will be paid at the Contract Bid Price per Cubic Yard, which price shall include all labor, material, equipment, tools, and incidental costs required to complete the work.

ITEM 149.2 PUBLIC OUTREACH LUMP SUM

The work under this item shall include assisting MassDOT in public participation and information for the duration of construction. Public participation and communications are essential to the Project's development and construction phases. MassDOT will be conducting public outreach for this project by engaging with businesses, public safety agencies, hosting and abutting municipalities, elected officials, and other groups that may be impacted by this project.

MassDOT has separately engaged the service of a public engagement consultant. The Contractor will work closely with MassDOT and their public outreach consultant to support effective communication to abutters and travelers. The Contractor will work closely with MassDOT to communicate Project information and engage the public. MassDOT will use all available resources to communicate Project information including, but not limited to, broadcast and print media, variable message signs, a dedicated Project webpage, mobile media, existing MassDOT websites and other Commonwealth websites, fliers, fact sheets, social media, newsletters, e-mail, GovDelivery, presentations, briefings, public meetings, and project signage. The Contractor will have an important role in public engagement and communications and shall support preparation of materials and presentations, providing content to MassDOT to update the Project webpage, and any other media required for communicating Project information to all interested parties. All materials, where appropriate, shall incorporate the Project's message points, which will be prepared in collaboration with MassDOT. The Contractor shall assist with coordinating all Public Outreach responsibilities with the Engineer.

Public Outreach consists of both Department and Contractor activities. The Contractor shall assist MassDOT's consultant with the following responsibilities:

1. Preparing and transmitting the Public Meeting notice;
2. Preparing Public Meeting presentation materials;
3. Organizing and conducting up to five (5) Public Meetings:
4. Preparing and transmitting responses to public inquiries, comments and complaints;
5. Establishing and maintaining a Project website with (a minimum of) monthly updates, through MassDOT;
6. Preparing and maintaining Project website media;
7. Preparing and producing traffic updates and advisories with mapping, graphics, and narratives;

Products under this Item shall be provided in electronic format, and hardcopy if requested by MassDOT.

PUBLIC OUTREACH PROGRAM

Within thirty (30) Calendar Days of Notice to Proceed, the Contractor shall submit to the Engineer a Public Outreach Plan for review and approval. Included in the Contractor's submission to the Engineer shall be the credentials of all personnel proposed to perform Public Outreach activities.

All outreach information shall be listed on the Project webpage created by MassDOT's outreach consultant and functioning 30 days prior to the Public Meeting. The webpage shall provide Project impact information relative to local roads and I-291.

ITEM 149.2 (Continued)

The Contractor shall review the information on the Project webpage to ensure that it includes: MassDOT construction office contact information, up-to-date traffic advisories, traffic controls with supporting graphics and narrative to describe traffic management in place at all times including location and duration of long term lane closures and times for additional overnight lane closures, a look-ahead at travel impacts for the upcoming two-week period, a projected monthly construction activities narrative, monthly updated schedule, and a Project specific email address. The website shall offer visitors to register for GovDelivery email updates and shall provide information on travel resources.

The Contractor's Public Outreach Specialist shall notify MassDOT of changes in traffic management as major changes in traffic management configuration shall be communicated through press releases coordinated through MassDOT's consultant.

The Contractor shall designate management staff within its own workforce and provide their contact information to MassDOT as part of the Public Outreach Plan, who shall provide assistance to MassDOT and MassDOT's Public Outreach Consultant to ensure timely deliveries of Project website content, press releases and responsiveness to public inquiries and complaints.

The Contractor shall maintain a system for documenting all contact with abutters, property owners, residents, the general public, and the media. The Contractor shall provide the Engineer an electronic copy of all public contact records. The electronic file should be received by the 1st calendar day of each month and should include all contacts made prior to the 25th calendar day of the previous month.

PUBLIC MEETING

The Contractor shall attend a public meeting to encompass all affected communities thirty (30) days prior to the commencement of construction activities.

The Department intends to hold subsequent public meetings periodically for the duration of the project. The Contractor shall assist with coordinating and preparing for the meeting through its designated Public Outreach Specialist and in coordination with the Engineer. The Contractor shall procure a meeting room, preferably a municipal facility, but rental space, if necessary, for approximately 100 attendees. The Engineer shall have final approval of any meeting rooms/location. The meeting shall also be publicly accessible through a MassDOT-approved electronic meeting platform(s). The Contractor shall assist with preparing and transmit to local media a MassDOT-approved meeting notification for both in-person and electronic meeting attendance. The notice shall also be posted to the Project webpage.

CONSIDERATIONS

A maximum of five (5) public meetings throughout the duration of the project is anticipated. They will occur typically in the evening, typically for a few hours each meeting.

ITEM 149.2 (Continued)

The Contractor shall assist with the necessary staff, displays, renderings, and hand-outs to adequately portray the proposed construction. The construction schedule and traffic control details associated with each change in construction shall be presented to the public. All materials to be used and/or distributed must be reviewed and approved for use by the Engineer prior (minimum 1 week) to the public meeting.

The Contractor shall submit the meeting summary within two (2) workdays of the Public Meeting. At a minimum, the summary shall include a list of attendees, comments received, issues or concerns raised, copies of hand-outs, displays, and other presentation materials.

The Contractor shall provide electronic versions (in Adobe Acrobat .pdf format) of display boards and other materials presented at the Public Meeting to the MassDOT Engineer. The Public Meeting presentation shall be available on the Project website following the meeting.

Police, Fire, and Emergency Services Notification

The Contractor shall provide up to date information on all detours, traffic restrictions, and lane closures to State Police, local Police, Fire, and Emergency Response. This information shall be coordinated with MassDOT District 2 for approval prior to being issued to emergency agencies.

The public participation effort will be coordinated with MassDOT's Project Manager and MassDOT Communications and all standard protocols, Title VI of the Civil Rights Act of 1964, and guidance in the MassDOT Public Participation Plan will be followed.

SUBMITTALS

Construction Digital Recording

A qualified commercial photographer shall be engaged to take photographs / video during construction to document the project's progress and activities. The photographer shall be an individual of established reputation that has been regularly engaged as a professional photographer for not less than 5 years. The Contractor shall submit to MassDOT for approval the name and credentials of the photographer who will be responsible for taking the photographs during construction.

Progress Photographs

Digital photographs shall be taken on or about the last day of the month and also during and after completion of important stages of work as determined by MassDOT. As many digital images shall be taken as necessary in consultation with the Resident Engineer to adequately record construction progress.

A maximum of twenty-four (24) - 8" x 10" color glossy photographs may be requested by the Engineer each month from the digital images that are provided.

ITEM 149.2 (Continued)

The following deliverables for each submission shall be provided:

a) Digital Image Files (2 DVD copies).
b) Glossy Color Prints (2 copies).

Original unedited image files provided shall conform to the following requirements:

a) 300 dpi for professional prints up to 8”x10”.
b) JPEG format.
c) Digital Cameras used for the purpose of creating the above noted image files shall have a minimum sensor size of 15 million pixels with images taken at no less than 360 ppi for an 8”x12” image size.
d) Image files shall be named and a photo thumbnail index created with the following file naming convention: Project Number_date_photo number.jpg
e) A photo index (thumbnails) index sheet shall be included on the disk.

Color Prints shall conform to the following requirements:

a) Glossy color prints (8”x10” (plus binding edge)).
b) Single weight, fabric backed paper with binding edge and 1” wide margin punched for standard 3 ring binder.
c) Identification on rear side of each photo indicating, Project Name, Project Number, Contractor, View locations and orientation, date and time of exposure.
d) Prints shall be free of logos, copy rights, trademarks or any other identifying marks not indicated above. This requirement shall apply to both the front and back.
e) A hardcopy 8 ½" x 11" key plan or plans with an arrow for each photograph taken shall be provided with each DVD submission. Each arrow shall be labeled with the corresponding photograph number and shall be oriented to show the point of view of the photograph.

Submit color photos of each view selected within five (5) calendar days of the Engineer’s request. Each DVD and DVD jewel case shall be labeled with the name of the project, State project number, name of the Contractor, date of submission, and name and address of the photographer.

Project progress photos shall be submitted as digital files on write once DVD in a jewel case on a monthly basis. All subsequent DVD submissions shall include the image files of the previous submissions and the photo thumbnail indexes that contain all current and previous photos.

Before starting construction, take one set of color photographs of the bridge site and surrounding properties from different points of view as selected by the Engineer. Take photographs to show existing conditions to the property before starting work at the site.

Take one set of color photographs at the bridge site at no greater than three (3) month intervals until the project is completed, coinciding as closely as possible with the completion of a major construction phase. The photographer shall select the vantage points for each shot to best show the status of bridge construction and progress since the last photographs were taken. Photographs are for a record of the progress of work.

Take one set of color photographs upon notification by the Engineer of project completion.

ITEM 149.2 (Continued)

Time Lapse Photography / Videography

A time-lapse photographic documentation of the project shall be provided, as well as a Time Lapse Photography Plan to execute this task to the Engineer for approval.

Two DVD copies of the finished video shall be prepared and submitted to the Engineer.

The video shall be free of logos, copyrights, trademarks or any other identifying marks not indicated above.

BASIS OF PAYMENT

Item 149.2 will be paid for at the Contract unit price Lump Sum, which price shall be full compensations for all labor, materials, equipment, and all incidental costs required to complete the work.

20% of the lump sum will be paid after completion of the Public Outreach Plan, and Pre-Construction Public Meeting.

The remaining 80% (eighty percent) of this pay Item will be paid in equal monthly installments distributed across the time remaining in the accepted baseline schedule until substantial completion.

ITEM 180.01 ENVIRONMENTAL HEALTH AND SAFETY PROGRAM LUMP SUM

The work shall consist of ensuring the health and safety of the Contractor's employees and subcontracting personnel, the Engineer, their representatives, the environment, and public welfare from any on-site chemical contamination present in air, soil, water and sediment.

The Contractor shall prepare and implement a site-specific Environmental Health and Safety Plan (EHASP) which has been approved and stamped by a Certified Industrial Hygienist (CIH) and includes the preparer's name and work experience. The EHASP shall include appropriate components required by OSHA Standard 29 CFR 1910.120(b) and the Massachusetts Contingency plan (MCP) 310 CMR 40.0018 and must comply with all applicable state and federal laws, regulations, standards and guidelines, and provide a degree of protection and training appropriate for implementation on the project. The EHASP shall be a dynamic document with provision for change to reflect new information, new practices or procedures, changing site environmental conditions or other situations which may affect site workers and the public. The EHASP shall be developed and implemented independently from the standard construction HASP required to work on all MassDOT construction projects.

Health and safety procedures provided by the Contractor shall comply with all the appropriate regulations that address employee working conditions, including but not limited to standards established by OSHA and National Institute for Occupational Safety and Health (NIOSH). Equipment used for the purpose of health and safety shall be approved by and meet pertinent standards and specifications of the appropriate regulatory agencies.

A copy of the most up-to-date version of the EHASP shall be maintained on-site at all times by the Contractor. The on-site copy shall contain the signature of the Engineer and each on-site employee of the MassDOT, Contractor, and Subcontractors involved with on-site activities. The employee's signature on the EHASP shall be deemed prima facie evidence that the employee has read and understands the plan. Updated copies of signature sheets shall be submitted to the Engineer.

The EHASP shall specify a Contractor Site Safety and Health Officer responsible for implementation of the EHASP and to oversee all construction activities, including handling, storage, sampling and transport, which require contact with or exposure to potentially hazardous materials.

The level of protection, required to ensure the health and safety of on-site personnel will be stipulated in the EHASP. The Site Safety and Health Officer shall implement the EHASP based on changing site and weather conditions, type of operation or activity, chemical compounds identified on-site, concentration of the chemicals, air monitoring data, physical state of the hazardous materials, potential duration of exposure to hazardous materials, dexterity required to perform work, decontamination procedures, necessary personnel and type of equipment to be utilized.

ITEM 180.01 (Continued)

During implementation of the EHASP, a daily log shall be kept by the Site Safety and Health Officer and a copy shall be provided weekly to the Engineer. This log shall be used to record a description of the weather conditions, levels of personal protection being employed, screening data and any other information relevant to on-site environmental safety conditions. The Site Safety and Health Officer shall sign and date the daily log.

BASIS OF PAYMENT

Preparation and implementation of the Environmental Health and Safety Program, including the monitoring, protection and storage of all contaminated materials, as well as subsequent modifications to the EHASP, will be measured and paid for at the Lump Sum Bid Price.

Payment of 50% of the Environmental Health and Safety Program contract price will be made upon the initial acceptance of the EHASP by the Engineer. Payment of the remaining 50% of the Environmental Health and Safety Program contract price will be made upon completion of the work. The bid price shall include preparation and implementation of the EHASP as well as the cost for its enforcement by the Site Safety and Health Officer along with any necessary revisions and updates. The work of implementing the Environmental Health and Safety Program includes work involving, but not limited to, the monitoring, protection, and storage of all contaminated materials.

ITEM 180.02 PERSONAL PROTECTION LEVEL C UPGRADE HOUR

The work shall consist of providing appropriate personal protective equipment (PPE) for all personnel in an area either containing or suspected of containing a hazardous environment.

Contingencies for upgrading the level of protection for on-site workers will be identified in the EHASP and the Contractor shall have the capability to implement the personal protection upgrade in a timely manner. The protective equipment and its use shall be in compliance with the EHASP and all appropriate regulations and/or standards for employee working conditions.

Personal Protection Level C Upgrade will be measured and paid only upon upgrade to Level C and will be at the contract unit price, per hour, per worker, required in Level C personal protection. No payment will be made to the Contractor to provide Level D PPE.

ITEM 180.03 LICENSED SITE PROFESSIONAL SERVICES HOUR

Within limited areas of the project site, media (i.e. soils, sediments, surface water and/or groundwater) requiring evaluation and/or management under the Massachusetts Contingency Plan (MCP) may be encountered. A Licensed Site Professional (LSP) shall be required to provide the services necessary to comply with the requirements of the MCP. These services may include a site walk, field screening, sampling, analysis and characterization of potentially contaminated media, preparation and implementation of Immediate Response Action (IRA) Plans, Utility-Related Abatement Measure (URAM) and Release Abatement Measure (RAM) Plans, Imminent Hazard Evaluations, status reports, transmittal forms, release notification forms, risk assessments, completion statements, and related documents required pursuant to the MCP. LSP services shall also be necessary to temporarily move material generated on the project to an off-site storage location.

The name and qualifications of the LSP and all environmental technicians to be assigned to the project shall be submitted to the Engineer for approval at least four weeks prior to initial site activities. The LSP shall have a current, valid license issued by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals. The LSP shall have significant experience in the oversight of MCP activities at active construction sites. Qualification packages for the LSP and each technician shall include a resume, all recent work assignments with responsibilities identified (previous 5 years), and applicable training and certifications. A list of all Notices of Noncompliance, Notice of Audit Findings and Enforcement Orders issued by the Massachusetts Department of Environmental Protection (DEP) shall be submitted for all work assignments listed for the LSP and environmental technicians. Upon approval of the LSP Qualifications, the LSP will be designated as the LSP of Record unless MassDOT designates in writing otherwise. The LSP of Record will serve as the primary point of contact for all hazardous material matters on the project.

The LSP shall evaluate soil and/or sediment with discoloration, odor, elevated field screening results, presence of petroleum liquid or sheen on the groundwater surface, or any abnormal gas or materials in the ground which are known or suspected to be oil or hazardous materials. Excavated soil and sediment which is suspected of petroleum contamination shall be field screened using the jar headspace procedures according to established DEP Guidance. All field screening equipment must be pre-approved by the Engineer. The LSP shall ensure proper on-site calibration of all field screening instrumentation.

The Engineer shall be contacted immediately when observations or any field screening results verify contamination requiring further analysis, and/or enhanced management of suspect media. Any enhanced management of contaminated soil to ensure proper stockpiling and storage is incidental to the LSP Services item. The LSP shall evaluate the need for confirmatory sampling prior to backfill in areas where contaminated material has been excavated and disposed off-site for compliance with applicable regulatory requirements. The Engineer shall approve the locations of the testing sites prior to the sampling.

ITEM 180.03 (Continued)

Contaminated soil, sediment and/or groundwater shall be handled in accordance with all applicable Contaminated media shall be handled in accordance with all applicable state and federal statutes, regulations, and policies. The LSP shall adequately evaluate contaminated media for compliance with the requirements of the MCP and Department Policies.

The Contractor and the LSP shall be aware of the reporting requirements for releases of oil and/or other hazardous material (OHM) as set forth in federal and state laws and regulations and both shall be held responsible for performing the work in accordance with all applicable Federal and State laws and regulations. The LSP shall maintain written records in a clear and concise tabular format which tracks the excavation, stockpiling, analysis and reuse/disposal of all known/suspect contaminated media. These records shall be up-to-date and submitted to the Engineer on a bi-weekly basis. The LSP shall review and summarize the laboratory data from any analyses performed on contaminated media in a tabular format and compare the results to applicable reporting thresholds. A report shall be delivered to the Engineer outlining the material sampling methods, laboratory analysis results, evaluation of applicable regulatory exemptions, reporting obligations, and proposed course of action. The laboratory report together with Chain of Custody forms for all analytical results shall be submitted to the Engineer within 14 days after completion of such analyses.

The LSP and Contractor shall be held responsible for the submission of all MCP-related documents to the Engineer at least 14 days in advance of any timeframe specified in the MCP and for the timely submission of data and tracking information as noted within this Item. All documents prepared under this Item must be reviewed and signed by the approved LSP. The Contractor and LSP shall be responsible for all fines, damages, and enforcement requirements imposed by applicable regulatory agencies for failure to meet regulatory and contract timeframes. No compensation will be provided for such fines, damages, and enforcement actions.

The Contractor and the LSP shall be aware of the reporting requirements for releases of oil and/or other hazardous material (OHM) as set forth in federal and state laws and regulations and shall both be held responsible for performing the work in accordance with all applicable Federal and State laws and regulations.

If the Contractor causes a release of OHM, the Contractor shall be responsible for assessing and remediating the release in accordance with all pertinent State and Federal regulations, including securing the services of a LSP, at his own expense.

The LSP shall coordinate all activities involving both MassDOT and the DEP through the Engineer. Any notification of release shall be approved by the Engineer before submittal to the DEP, except if an imminent hazard condition exists as defined in 309 CMR 4.03(4)(b).

ITEM 180.03 (Continued)

LABORATORY TESTING IN SUPPORT OF LSP SERVICES

Laboratory testing provides for analytical testing in support of LSP services related to maintaining MCP compliance, such as delineating the extent and type of contamination present. Sampling and testing for disposal purposes are not included and are incidental to Items 181.11-181.14.

In order to maintain compliance with the MCP and Department Policies or other regulatory requirements, the LSP shall request approval from the Engineer to obtain samples from various locations and depths within the project area and to perform laboratory analyses on those samples. No sampling shall be conducted without prior approval from the Engineer. The samples shall be delivered to a DEP-certified laboratory using proper chain-of-custody documentation for analyses which, depending upon site conditions and suspected and/or identified contaminants of concern, may include, but are not limited to, metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polycyclic aromatic hydrocarbons (PAHs), extractable petroleum hydrocarbons (EPHs) and volatile petroleum hydrocarbons (VPHs). Subsequent testing, depending upon initial results, may be required for Toxicity Characteristic Leaching Procedure (TCLP) analyses (EPA Method 1311) for metals.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

LSP Services for work under this item will be measured per person, per hour of service provided by LSP, Environmental Technicians and other approved personnel. Travel time shall not be included in the billable hours.

The quantity and type of laboratory tests must be approved by the Engineer beforehand. The Contractor will be reimbursed upon satisfactory written evidence of payment. The Contractor may be required to obtain cost estimates from three DEP certified laboratories for the Engineer to choose the service provider.

LSP Services will be paid at the Contractor bid price for each hour, or fraction thereof, spent to perform the work as described above. The bid price shall be a blended rate that includes the cost of the LSP, environmental technicians and other personnel, the performance of all work tasks and field screening, including required equipment, materials and instrumentation, and production of all documentation described above. All requests for payment must be accompanied by the following information: the names of the personnel associated with the work charged under LSP Services, dates and hours worked, work conducted, including, where appropriate, locations as identified on the construction plans, and a copy of the field diary for the dates submitted.

Laboratory testing will be reimbursed upon receipt of paid invoices for testing approved by the Engineer.

This item is for LSP work for compliance with the MCP and Department Policies. LSP hours and any laboratory testing related to off-site disposal of excess soil and sediment is incidental to Items 181.11-181.14 (including, but not limited to, disposal characterization, disposal package preparation, landfill acceptance, shipment paperwork preparation, field screening, and tracking). LSP hours for groundwater management (including characterization, obtaining off-site discharge permits, compliance testing, etc.) is incidental to Item 183.1.

ITEM 181.11 DISPOSAL OF UNREGULATED SOIL TON
ITEM 181.12 DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY TON
ITEM 181.13 DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY TON
ITEM 181.14 DISPOSAL OF HAZARDOUS WASTE TON

The work under these Items shall include the transportation and disposal of contaminated material excavated, or excavated and stockpiled. It shall also include the cost of any additional laboratory analyses required by a particular disposal facility beyond the standard disposal test set.

Excavation of existing subsurface materials may include the excavation of contaminated soils. The Contractor shall be responsible for the proper coordination of characterization, transport and disposal, recycling or reuse of contaminated soils. Disposal, recycling or reuse will be referred to as "disposal" for the purposes of this specification. However, regardless of the use of the term herein, there will be no compensation under these items for reuse within the project limits. The Contractor will be responsible for coordinating the activities necessary for characterization, transport and disposal of contaminated soils. Such coordination will include the Engineer and his/her designee overseeing management of contaminated materials. Contaminated soils must be disposed of in a manner appropriate for the soil classification as described below and in accordance with the applicable laws of local, state and federal authorities. The Contractor shall be responsible for identifying disposal facility (ies) licensed to accept the class of contaminated soils to be managed and assure that the facility can accept the anticipated volume of soil contemplated by the project. The Contractor shall be responsible for hiring a Licensed Site Professional (LSP) and all ancillary professional services including laboratories as needed for this work. The Contractor will be responsible for obtaining all permits, approvals, manifests, waste profiles, Bills of Lading, etc. subject to the approval of the Engineer prior to the removal of the contaminated soil from the site. The Contractor and LSP shall prepare and submit to the Engineer for approval all documents required under the Massachusetts Contingency Plan (MCP) and related laws and environmental regulations to conduct characterization, transport, and disposal of contaminated materials.

CLASSES OF CONTAMINATED SOILS

The Contractor and its LSP shall determine if soil excavated or soil to be excavated is unregulated soil or contaminated soil as defined in this section. Such materials shall be given a designation for purposes of reuse or disposal based on the criteria of the MCP. Soils and sediments which are not suitable for reuse will be given a designation for purposes of off-site disposal based on the characterization data and disposal facility license requirements. The Classes of Contaminated Soils are defined as follows:

ITEMS 181.11 through 181.14 (Continued)

UNREGULATED SOIL consists of soil, fill and dredged material with measured levels of oil and hazardous material (OHM) contamination at concentrations below the applicable Reportable Concentrations (RCs) presented in the MCP. Unregulated soil consists of material which may be reused (or otherwise disposed) as fill within the Commonwealth of Massachusetts subject to the non-degradation criteria of the MCP (310 CMR 40.0032(3), in a restricted manner, such that they are sent to a location with equal or higher concentrations of similar contaminants. Disposal areas include licensed disposal facilities, approved industrial settings in areas which will be capped or covered with pavement or loamed and seeded, and for purposes of this project should be reused as fill within the project site construction corridor whenever possible. The material cannot be placed in residential and/or environmentally sensitive (e.g. wetlands) areas. Under no circumstances shall contaminated soils be placed in an uncontaminated or less contaminated area (including the area above the groundwater table if this area shows no sign of contamination).

The Contractor shall submit to MassDOT the proposed disposal location for unregulated soils for approval. If such a disposal location is not a licensed disposal facility, the Contractor shall submit to the Engineer analytical data to characterize the disposal area sufficiently to verify that the unregulated material generated within the MassDOT construction project limits is equal to or less than the contaminant levels at the disposal site and meets the non-degradation requirements of the MCP. In addition, the Contractor shall provide written confirmation from the owner of the proposed disposal location that they have been provided with the analytical data for both the materials to be disposed as well as the disposal site characterization and that s/he agrees to accept this material. A Material Shipping Record or Bill of Lading, as appropriate, shall be used to track the off-site disposal of unregulated soil and a copy, signed by the disposal facility or property owner, shall be provided to the Engineer in order to document legal disposal of the unregulated material.

The cost of on-site disposal of unregulated soil within the project area will be considered incidental to the item of work to which it pertains.

ITEMS 181.11 through 181.14 (Continued)

REGULATED SOIL consists of materials containing measurable levels of OHM that are equal to or exceed the applicable Reportable Concentrations for the site as defined by the MCP, 310 CMR 40.0000. Regulated soil which meets the MCP reuse criteria of the applicable soil/groundwater category for this project area may be reused on site provided that it meets the appropriate geotechnical criteria established by the Engineer. Regulated Soil may be reused (as daily or intermediate cover or pre-cap contouring material) or disposed (as buried waste) at lined landfills within the Commonwealth of Massachusetts or at an unlined landfill that is approved by the Massachusetts Department of Environmental Protection (DEP) for accepting such material, in accordance with DEP Policy #COMM-97-001, or at a similar out-of-state facility. It should be noted that soils which exceed the levels and criteria for disposal at in-state landfills, as outlined in COMM-97-001, may be shipped to an in-state landfill, but require approval from the DEP Division of Solid Waste Management and receiving facility. An additional management alternative for this material is recycling into asphalt. Regulated Soils may also be recycled at a DEP approved recycling facility possessing a Class A recycling permit subject to acceptance by the facility and compliance with DEP Policy #BWSC-94-400. Regulated Soil removed from the site for disposal or treatment must be removed via an LSP approved Bill of Lading, Manifest or applicable material tracking form. This type of facility shall be approved/permitted by the State in which it operates to accept the class of contaminated soil in accordance with all applicable local, state and federal regulations.

HAZARDOUS WASTE consists of materials which must be disposed of at a facility permitted and operated in full compliance with Federal Regulation 40 CFR 260-265, Massachusetts Regulation 310 CMR 30.000, Toxic Substances Control Act (TSCA) regulations, or the equivalent regulations of other states, and all other applicable local, state, and federal regulations. All excavated materials classified as hazardous waste shall be disposed of at an out-of-state permitted facility. This facility shall be a RCRA hazardous waste or TSCA facility, or RCRA hazardous waste incinerator. This type of facility shall be approved/permitted by the State in which it operates to accept hazardous waste in accordance with all applicable local, state and federal regulations and shall be permitted to accept all contamination which may be present in the soil excavate. The Contractor shall ensure that, when needed, the facility can accept TSCA waste materials i.e. polychlorinated biphenyls (PCBs). Hazardous waste must be removed from the site for disposal or treatment via an LSP approved Manifest.

MONITORING/SAMPLING/TESTING REQUIREMENTS

The Contractor shall be responsible for monitoring, sampling and testing during and following excavation of contaminated soils to determine the specific class of contaminated material. Monitoring, sampling and testing frequency and techniques should be performed in accordance with Item 180.03 – LSP Services. Additional sampling and analysis may be necessary to meet the requirements of the disposal facility license. The cost of such additional sampling and analysis shall be included in the bid cost for the applicable disposal items. The Contractor shall obtain sufficient information to demonstrate that the contaminated soil meets the disposal criteria set by the receiving facility that will accept the material.

ITEMS 181.11 through 181.14 (Continued)

No excavated material will be permanently placed on-site or removed for off-site disposal until the results of chemical analyses have been received and the materials have been properly classified. The Contractor shall submit to the Engineer results of field and laboratory chemical analyses tests within seven days after their completion, accompanied by the classification of the material determined by the Contractor, and the intended disposition of the material. The Contractor shall submit to the Engineer for review all plans and documents relevant to LSP services, including but not limited to, all documents that must be submitted to the DEP.

WASTE TRACKING

Copies of the fully executed Weight Slips/Bills of Lading/ Manifests/Material Shipping Records or other material tracking form received by the Contractor from each disposal facility and for each load disposed of at that facility, shall be submitted to Engineer and the Contractor's LSP within three days of receipt by the Contractor. The Contractor is responsible for preparing and submitting such documents for review and signature by the LSP or other appropriate person with signatory authority, three days in advance of transporting soil off-site. The Contractor shall furnish a form attached to each manifest or other material tracking form for all material removed off-site, certifying that the material was delivered to the site approved for the class of material. If the proposed disposition of the material is for reuse within the project construction corridor, the Contractor shall cooperate with MassDOT to obtain a suitable representative sample(s) of the material to establish its structural characteristics in order to meet the applicable structural requirements as fill for the project.

All material transported off-site shall be loaded by the Contractor into properly licensed and permitted vehicles and transported directly to the selected disposal or recycling facility and be accompanied by the applicable shipping paper. At a minimum, truck bodies must be structurally sound with sealed tail gates, and trucks shall be lined and loads covered with a liner, which shall be placed to form a continuous waterproof tarpaulin to protect the load from wind and rain.

DECONTAMINATION OF EQUIPMENT

Tools and equipment which are to be taken from and reused off site shall be decontaminated in accordance with applicable local, state and federal regulations. This requirement shall include, but not be limited to, all tools, heavy machinery and excavating and hauling equipment used during excavation, stockpiling and handling of contaminated material. Decontamination of equipment is considered incidental to the applicable excavation item.

ITEMS 181.11 through 181.14 (Continued)

REGULATORY REQUIREMENTS

The Contractor shall be responsible for adhering to regulations, specifications and recognized standard practices related to contaminated material handling during excavation and disposal activities. MassDOT shall not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers and others. The Contractor shall comply with all rules, regulations, laws, permits and ordinances of all authorities having jurisdiction including, but not limited to, Massachusetts DEP, the U.S. Environmental Protection Agency (EPA), Federal Department of Transportation (DOT), Massachusetts Water Resources Authority (MWRA), the Commonwealth of Massachusetts and other applicable local, state and federal agencies governing the disposal of contaminated soils.

All labor, materials, equipment and services necessary to make the work comply with such regulations shall be provided by the Contractor without additional cost to MassDOT. Whenever there is a conflict or overlap within the regulations, the most stringent provisions shall apply. The Contractor shall reimburse MassDOT for all costs it incurs, including penalties and/or for fines, as a result of the Contractor's failure to adhere to the regulations, specifications, recognized standard practices, etc., that relate to contaminated material handling, transportation and disposal.

SUBMITTALS

I. Summary of Sampling Results, Classification of Material and Proposed Disposal Option.

The following information, presented in tabular format, must be submitted to the Engineer for review and approval prior to any reuse on-site or disposal off-site. This requirement is on-going throughout the project duration. At least two weeks prior to the start of any excavation activity, the Contractor shall submit a tracking template to be used to present the information as stipulated below. Excavation will not begin until the format is acceptable to MassDOT.

Characterization Reports will be submitted for all soil, sediment, debris and groundwater characterized through the sampling and analysis program. Each report will include a site plan which identifies the sampling locations represented in the Report. The Construction Plan sheets may be used as a baseplan to record this information.

The Sampling Results will be presented in tabular format. Each sample will be identified by appropriate identification matching the sample identification shown on the Chain of Custody Record. The sample must also be identified by location (e.g. grid number or stockpile number). For each sample, the following information must be listed: the classification (unregulated, regulated, etc.), proposed disposal option for the stockpile or unit of material represented, and, all analytical results.

ITEMS 181.11 through 181.14 (Continued)

Each Characterization Report will include the laboratory analytical report and Chain of Custody Record for the samples included in the Report.

II. Stockpiling, Transport, and Disposal.

At least two weeks prior to the start of any excavation activity, the Contractor shall submit, in writing, the following for review and shall not begin excavation activity until the entire submittal is acceptable to MassDOT.

Excavation and Stockpiling Protocol:
Provide a written description of the management protocols for performing excavation and stockpiling and/or direct loading for transport, referencing the locations and methods of excavating and stockpiling excavated material.

Disposal and Recycling Facilities:

1. Provide the name, address, applicable licenses and approved waste profile for disposal and/or recycling location(s) where contaminated soil will be disposed. Present information substantiating the suitability of proposed sites to receive classifications of materials intended to be disposed there, including the ability of the facility to accept anticipated volumes of material.

2. Provide a summary of the history of compliance actions for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. Material should not be sent to facilities which are actively considered by the DEP, USEPA or other responsible agency to be in violation of federal, state or local hazardous waste or hazardous material regulations. MassDOT reserves the right to reject any facility on the basis of poor compliance history.

Transportation:
The name, address, applicable license and insurance certificates of the licensed hauler(s) and equipment and handling methods to be used in excavation, segregation, transport, disposal or recycling.

III. Material Tracking and Analytical Documentation for Reuse/Disposal.

The following documents are required for all excavation, reuse and disposal operations and shall be in the format described. At least two weeks prior to the start of any excavation or demolition activity, the Contractor shall submit the tracking templates required to present the information as stipulated below. Excavation or demolition will not begin until the format is acceptable to MassDOT.

ITEMS 181.11 through 181.14 (Continued)

All soils, sediments and demolition debris must be tracked from the point of excavation to stockpiling to onsite treatment/processing operations to off-site disposal or onsite reuse as applicable.

Demolition Debris:
Demolition debris must be tracked if the debris is stockpiled at a location other than the point of origin or if treatment or material processing is conducted. Identification of locations will be based on the station-offset of the location. The tracking table will identify date and point of generation, any field screening such as PID or dust monitoring, visual observations/comments, quantity, and stockpile ID/processing operation location. For each unit of material tracked, the table will also track reuse of the material on-site, providing reuse date, location of reuse as defined by start and end station, width of reuse location by offset, the fill elevation range, quantity, and finish grade for said location. For demolition debris which is not reused on site, the table will also track disposal of the material as defined by disposal date, quantity and disposal facility. The table must provide a reference to any analytical data generated for the material.

Soil/Sediment:
Soil excavation will be identified based on the station-offset of the excavation location limits. The tracking table will identify date and point of generation, any field screening such as PID or dust monitoring, visual observations, quantity, and stockpile number/location. For each unit of material tracked, the table will also track reuse of the material on-site and disposal of the material off-site using the same categories identified for demolition debris above.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Disposal of contaminated soil shall be measured for payment by the Ton of actual and verified weight of contaminated materials removed and disposed of. The quantities will be determined only by weight slips issued by and signed by the disposal facility. The most cost-effective, legal disposal method shall be used. The work of the LSP for disposal under all of these items shall be incidental to the work with no additional compensation.

ITEM 181.11 Measurement for Disposal of Unregulated Soil shall be under the Contract Unit Price by the weight, in tons, of contaminated materials removed from the site and transported to and disposed of at an approved location or licensed facility, and includes any and all costs for approvals, permits, fees and taxes, additional testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEM 181.12 Measurement for Disposal of Regulated Soil – In-State Facility shall be under the Contract Unit Price by the weight in tons of contaminated materials removed from the site and transported to and disposed of at an approved in-state facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEMS 181.11 through 181.14 (Continued)

ITEM 181.13 Measurement for Disposal of Regulated Soil - Out-of-State Facility shall be under the Contract Unit Price by the weight in tons of contaminated materials removed from the site and transported to and disposed of at an approved out-of-state facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEM 181.14 Measurement for Disposal of Hazardous Waste shall be under the Contract Unit Price by the weight in tons of hazardous waste removed from the site and transported to and disposed of at the licensed hazardous waste facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS LUMP SUM

The work shall include the inspecting and testing of all materials suspected of containing asbestos. When any demolition is required to enable the inspection and testing of the suspected material it will be considered incidental to this Item and the Contractor must perform all asbestos handling and testing in accordance with the regulations stated below.

Dust suppression in the form of light water sprays, foams, dust suppressants and calcium chloride will be implemented as required to control dusting during any disturbance of asbestos suspected material. Alternatively, intrusive activities may be reduced or curtailed under high wind or heavy rain conditions, which in the opinion of the Health and Safety Plan (HASP) may pose a safety hazard to the workers.

The Contractor shall employ the services of a Massachusetts licensed "Asbestos Inspector" to inspect the material to determine whether or not "ITEM 182.2 REMOVAL OF ASBESTOS" is required. Should the asbestos inspector determine laboratory testing is required, a state certified laboratory shall be used to perform all necessary tests.

REGULATIONS

U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA) including but not limited to:

29 CFR 1910 Section 1001 and 29 CFR 1926 Section 58 Occupational exposure to Asbestos, Tremolite, Anthophyllite and Actinolite, Final Rule
29 CFR 1910 Section 134 Respiration Protection
29 CFR 1926 Construction Industry
29 CFR 1910 Section 2 Access to Employee Exposure and Medical Records
29 CFR 1910 Section 1200 Hazard Communication
29 CFR 1910 Section 145 Specifications for Accident Prevention Signs and Tags

U.S. Environmental Protection Agency, (EPA) including but not limited to:

40 CFR 762, CPTS 62044, FRL 2843-9, Federal Register Vol. 50 no.134, July 12, 1985 p.28530 - 28540 Asbestos Abatement Projects Rule
40 CFR 61 Subpart A Regulation for Asbestos
40 CFR 61 Subpart M (Revised Subpart B) National Emission Standard for Asbestos

ITEM 182.1 (Continued)

U.S. Department of Transportation 49 CFR 172 and 173

Massachusetts Department of Labor Standards Regulations, (DLS) including but not limited to:

454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

Massachusetts Department of Environmental Protection (DEP) including but not limited to (supplementing subsection 7.01):

310 CMR 7.00, Section 7.09 Odor and Dust, Section 7.10 Noise, Section 7.15 Air Pollution Control Regulations
310 CMR 18.00 and 19.00 Solid Waste Regulations

Massachusetts Division of Industrial Safety 45 CMR 10.00

Local Requirements including but not limited to those of Health Departments, Fire Departments and Inspection Services Departments

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

BASIS OF PAYMENT

Item 182.1 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, tools, equipment, and all incidental costs required to complete the work as described and as required by the Engineer.

No separate payment will be made for the protection of general public, private property, the proper inspecting and testing of the material, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 182.2 REMOVAL OF ASBESTOS FOOT

The work shall include the removal and satisfactory disposal of existing asbestos. The Contractor's attention is directed to the fact that existing asbestos shall be inspected and tested prior to removal, to determine if special removal and disposal is required. The Contractor shall follow all the rules and regulations stated in "ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS". If asbestos is present, the Contractor shall follow all the rules and regulations stated in the section "REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS", under this item. The Contractor should notify and coordinate his/her efforts with the proper utility accordingly.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

This section specifies the requirements for the handling and removal of asbestos containing material. The Contractor must perform all asbestos handling and removal work in accordance with these specifications and the following additional requirements.

U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA) including but not limited to:

29 CFR 1910 Section 1001 and 29 CFR 1926 Section 58 Occupational exposure to Asbestos, Tremolite, Anthophyllite and Actinolite, Final Rule
29 CFR 1910 Section 134 Respiration Protection
29 CFR 1926 Construction Industry
29 CFR 1910 Section 2 Access to Employee Exposure and Medical Records
29 CFR 1910 Section 1200 Hazard Communication
29 CFR 1910 Section 145 Specifications for Accident Prevention Signs and Tags

U.S. Environmental Protection Agency, (EPA) including but not limited to:

40 CFR 762, CPTS 62044, FRL 2843-9, Federal Register Vol. 50 no.134, July 12, 1985 p.28530 - 28540 Asbestos Abatement Projects Rule
40 CFR 61 Subpart A Regulation for Asbestos
40 CFR 61 Subpart M (Revised Subpart B) National Emission Standard for Asbestos

ITEM 182.2 (Continued)

U.S. Department of Transportation 49 CFR 172 and 173

Massachusetts Department of Labor Standards, (DLS) including but not limited to:

454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

Massachusetts Department of Environmental Protection (DEP) including but not limited to (supplementing subsection 7.01):

310 CMR 7.00, Section 7.09 Odor and Dust, Section 7.10 Noise, Section 7.15 Air Pollution Control Regulations
310 CMR 18.00 and 19.00 Solid Waste Regulations

Massachusetts Division of Industrial Safety 45 CMR 10.00

Local Requirements including but not limited to those of Health Departments, Fire Departments and Inspection Services Departments

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

All asbestos material shall be removed and properly disposed of by a contractor or subcontractor with a current Massachusetts Abatement Contractors License issued by the Department of Labor Standards. Work shall be supervised by a competent person as required by OSHA in 29 CFR 1926 to ensure regulatory compliance. This person must have completed a course at an EPA Training Center or equivalent course in asbestos abatement procedures, have had a minimum of four years on-the-job training and meet any additional requirements set forth in 29 CFR 1926 for a Competent Person. This person must also be certified by the Commonwealth as an Asbestos Supervisor and Asbestos Project Designer as required by 454 CMR 28.00.

Asbestos removal work shall be coordinated with all other work under the contract and shall be completed prior to performing any activities which could disturb the asbestos material or produce airborne asbestos fibers.

Dust suppression in the form of light water sprays, foams, dust suppressants and calcium chloride will be implemented as required to control dusting during trenching and excavation. Alternatively, intrusive activities may be reduced or curtailed under high wind or heavy rain conditions, which in the opinion of the Health and Safety Plan (HASP) may pose a safety hazard to the workers.

ITEM 182.2 (Continued)

NOTIFICATION AND PERMITS

The Contractor shall prepare a formal pre-notification form at least ten (10) days prior to the start of asbestos removal work. This form must be submitted to the appropriate Regional Office of the Massachusetts Department of Environmental Protection and to the U.S. Environmental Protection Agency Region I Air and Hazardous Material Division. A copy of the submitted forms must be provided to the Engineer and kept at the work site.

Prior to starting any work, the Contractor shall also obtain any required asbestos removal permit(s) from the city/town. A copy of the permit(s) must be provided to the Engineer and posted at the work site.

The Contractor shall also obtain and pay all other applicable asbestos waste transportation and disposal permits, licenses and fees.

STANDARD OPERATING PROCEDURES

The standard operating procedure shall ensure the following:

1. Proper site security including posting of warning signs and restricting access to prevent unauthorized entry into the work spaces.

2. Proper protective clothing and respiratory protection prior to entering the work spaces.

3. Safe work practices including provisions for communications; exclusion of eating, drinking, smoking, or use of procedures or equipment that would in any way reduce the effectiveness of respiratory protection or other engineering controls.

4. Proper exit practices from the work space though the showering and decontamination facilities.

5. Removing asbestos containing material in ways that minimize release of fibers.

6. Packing, labeling, loading, transporting and disposing of contaminated material in a way that minimizes or prevents exposure and contamination.

7. Emergency evacuation of personnel, for medical or safety (fire and smoke) so that exposure will be minimized.

8. Safety from accidents in the work space, especially from electrical shocks, slippery surfaces and entanglements in loose hoses and equipment.

9. Provisions for effective supervision and OSHA - specified personnel air monitoring for exposure during work.

ITEM 182.2 (Continued)

REQUIRED SUBMITTALS

The Contractor shall submit to the Engineer the following listed items at least ten (10) calendar days prior to the start of asbestos work. No asbestos removal work activities shall commence until these items are reviewed by the Engineer, unless otherwise waived. Submittals shall be clearly labeled and in sufficient detail to enable the Engineer to form an opinion as to its conformity to the specifications.

1. Name, experience and DLS certification of proposed Supervisors and Foreman responsible for asbestos work.

2. Summary of workforce by disciplines and a notarized statement documenting that all proposed workers, by name, have received all required medical exams and have been properly trained and certified for asbestos removal work, respirator use and appropriate Massachusetts DLS, EPA and OSHA standards.

3. Notarized statement that workers are physically fit and able to wear and use the type of respiratory protection proposed for the project. Notarized certification signed by an officer of the abatement contracting firm that exposure measurements, medical surveillance and worker training records are being kept in conformance with 29 CFR 1926.

4. Written plan of action and standard operating procedures (HASP) to include: location and layout of decontamination areas; sequencing of asbestos work; detailed schedule of work activities by date and interface with other project activities which affect work performance; methods used to assure safety and security; worker protection and exposure monitoring; contingency and emergency evacuation procedures; detailed description of methods to be employed to control pollution; waste handling procedures.

5. Written respiratory protection program specifying level of protection intended for each operation required by the project and details of daily inspection and maintenance elements.

6. Copies of the U.S. EPA, State and local asbestos removal pre-notification forms. If applicable, lists and copies of all permits, licenses, or manifests which will be applied for and used.

7. Name, location and applicable approval certificates for primary and secondary landfill for disposal of asbestos-containing or asbestos contaminated waste. Name, address and licenses number(s) of hauler permitted to transport waste. (Submit copies of completed manifests upon disposal).

ITEM 182.2 (Continued)

The Contractor must provide copies of daily inspection and record logs upon request of the Engineer, at any time during project. This information will include but is not limited to work area entry data, respirator inspections and maintenance, HEPA-exhaust inspections and maintenance and other work applicable activities or reports of accidents or unusual events.

METHOD OF MEASUREMENT

Item 182.2 will be measured for payment by the Foot for the complete removal and disposal of the asbestos containing material.

BASIS OF PAYMENT

Item 182.2 will be paid for at the Contract unit price per FOOT, which price shall include all labor, materials, tools, equipment, and all incidental costs required to complete the work specified above and as required by the Engineer.

No separate payment will be made for the protection of general public, private property, the proper inspecting and testing of the material, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 182.3 ASBESTOS ABATEMENT FOR BUILDING DEMOLITION LUMP SUM

SCOPE OF WORK

The work to be performed under these items consists of asbestos related abatement activities, and associated response actions. These activities include, but are not limited to, removal, and disposal of asbestos-containing materials (ACM). The work to be performed shall consist of submission of all required notifications and permits, furnishing all materials, equipment and labor to perform the necessary work.

CONTRACT REQUIREMENTS

The work under these items shall consist of abatement of identified ACM from areas within the interior or on the exterior of buildings to be demolished. The Contractor must perform all ACM handling and abatement work in accordance with these specifications and the following additional requirements:

1. U. S. Department of Labor, Occupational Safety and Health Administration (OSHA) including but not limited to:

    a. 29 CFR 1910.1001 and 29 CFR 1926.1101 Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite, Final Rule.

    b. 29 CFR 1910.134 Respiratory Protection 29 CFR 1926 Construction Industry 29 CFR 1910.02 Access to Employee Exposure and Medical Records 29 CFR 1910.1200 Hazard Communication.

    c. 29 CFR 1910.145 Specification for Accident Prevention Signs and Tags.

2. U. S. Environmental Protection Agency, (EPA) including but not limited to:

    a. 40 CFR 762, CPTS 62044, FRL 2843-9, Federal Register Vol. 50 no. 134, July 12, 1985 p.28530-28540 Asbestos Abatement Projects Rule.

    b. 40 CFR 61 Subpart A, Regulations for Asbestos.

    c. 40 CFR 61 Subpart M (Revised Subpart B) National Emission Standard for Asbestos.

3. U. S. Department of Transportation 49 CFR 172 and 173.

4. Massachusetts Department of Labor Standards, (DLS) including but not limited to:

    a. 454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos.

ITEM 182.3 (Continued)

5. Massachusetts Department of Environmental Protection, (DEP) including but not limited to:

    a. 310 CMR 7.00, 7.15 Air Pollution Control Regulations.

    b. 310 CMR 18.00 and 19.00 Solid Waste Regulations.

6. Massachusetts Division of Industrial Safety 45 CMR 10.00.

7. Local Requirements including but not limited to those of Health Departments, Fire Departments and Inspection Services Departments.

8. All provisions of this item relating to health and safety of the workers and the public and protection of the environment are minimum standards. The Contractor is responsible for determining whether any additional and/or more stringent protective measures are necessary by legal requirements or prudent conservative practice and for implementing such measures. Nothing in this Specification shall be deemed to relieve the Contractor from any liability with respect to any such legal requirement of prudent conservative practice.

9. The Contractor shall deliver all materials to the site in the original containers bearing the name of the manufacturer and details for proper storage and usage.

10. All materials, tools, and equipment must comply, at a minimum, with this specification, and relevant federal, state and local standards and codes.

11. All boxes and equipment shall be clean of asbestos fibers before arriving on-site and before exiting a Work Area. This cleaning, where necessary, will be performed so there will be no confusion as to the origin of any dust or debris.

EXECUTION OF WORK

An Asbestos Consulting Firm (ACF), retained and directed by the Department under a separate contract and having no affiliation with the abatement Contractor, will provide third party oversight of all abatement activity and associated response actions to determine conformance with applicable Federal, State or local regulatory requirements governing this activity.

ITEM 182.3 (Continued)

ASBESTOS CONSULTING FIRM

The ACF will be available on-site during the handling of asbestos-containing material, at no cost to the Contractor, to provide the following services:

1. Consultation with the Department and the Contractor on the technical aspects of asbestos removal and repair.

2. Review of preparation and isolation of Work Area, personnel protection and industrial hygiene practices.

3. Testing adequacy of HEPA-filtered exhausts in maintaining negative differential pressure within all Work Areas.

4. Air monitoring inside and outside the Work Area during asbestos removal to determine that acceptable low levels of fiber concentrations are maintained.

5. Visual inspection for the removal of visible asbestos and debris and testing and certifying that the Work Area is at an acceptable fiber/cc concentration following asbestos removal.

6. The air monitoring by the Asbestos Consultant Firm shall not relieve the Contractor of his obligations under all-applicable Federal and State regulations and requirements.

ADMINISTRATIVE REQUIREMENTS

Minimum administrative and supervisory requirements necessary for coordination of work on the project, include, but are not necessarily limited to, the following:

A. The Contractor must provide a full-time Project Manager who is experienced in administration and supervision of asbestos abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc. This person shall be available to the Engineer, the District Asbestos Coordinator and the ACF as the Contractor's primary contact at all times while work is in progress.

B. The Contractor must provide a full-time licensed supervisor for all asbestos abatement work who is experienced in the supervision of asbestos abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc. This person shall remain at the work site at all times while work is in progress. This person must have completed a course at an EPA Training Center or equivalent certificate course in supervisor asbestos abatement procedures, have a minimum of four (4) years on-the job training and meet any additional requirements set forth in 29 CFR 1926 for a competent person. This person must also be certified by the Commonwealth of Massachusetts as an Asbestos Supervisor and as required by 454 CMR 28.00. This person is the Competent Person as required by OSHA in 29 CFR 1926 for the Contractor, and is the Contractor's representative responsible for compliance with all applicable Federal, state and local regulations, particularly those relating to asbestos-containing materials.

ITEM 182.3 (Continued)

C. The Contractor will attend meetings, called by the Department as deemed necessary. Costs for a site meeting shall be considered incidental to the contract.

D. The Contractor will be provided with results of any asbestos survey performed by the Department for the buildings to be demolished.

ASSIGNMENT OF WORK

No work shall be performed until specifically authorized by the Department.

CONTRACT SUBMITTALS

PRE-CONSTRUCTION SUBMITTALS

1. Proof of certification by the Massachusetts Department of Labor Standards of the Abatement Entity.

2. Descriptions and references of similar asbestos control work, and a list of the supervisory personnel who may be assigned to this item, if awarded, including descriptions of their experience and qualifications in asbestos control work.

3. A list of equipment available to be used. This list should include a description of all Highly Efficient Particulate Air (HEPA) filtered exhaust units including make, model number and capacity and National Institute for Occupational Safety and Health (NIOSH) certification of the respirators that will be used by the Contractor's workers.

PRE-ASSIGNMENT REQUIREMENTS

SUBMITTALS

A. The Contractor shall be responsible for submitting notifications and obtaining all necessary permits, licenses and approvals before any asbestos abatement can begin. The Contractor must use an EPA approved landfill for disposal of asbestos waste and must use properly placarded vehicles when transporting the asbestos waste to the landfill. The Contractor will make all necessary notifications at least ten (10) working days prior to the scheduled start date determined by the Department. Notifications will be sent to the following agencies:

1. US Environmental Protection Agency, Region 1
2. Massachusetts Department of Environmental Protection
3. Massachusetts Department of Labor Standards

ITEM 182.3 (Continued)

B. Prior to starting any work, the Contractor shall also obtain any required asbestos removal permit(s) from the Town or City. A copy of the notifications and permit(s) if applicable shall be provided to the Engineer and the ACF.

C. If requested, by the Engineer or District Asbestos Coordinator, the Contractor shall develop and submit to the ACF for approval a detailed Asbestos Abatement Plan. Such a plan shall include, but not be limited to, the precise personal protective equipment to be used, the location of containments and/or regulated areas including; clean and dirty areas, buffer zones, showers, storage areas, change rooms, removal method, interface of trades, sequencing of removal related work, disposal plan, type of wetting agents to be used, locations of local exhaust equipment and planned air monitoring strategies. The plan shall also include both fire and medical emergency response plans. This Asbestos Abatement Plan shall be submitted for approval prior to the start of any abatement activity. The Contractor and the ACF shall meet with the Engineer and the District Asbestos Coordinator to discuss, in detail, the Asbestos Abatement Plan, including work procedures and safety precautions. Once approved, the plan will be enforced as if and addition to this specification. Costs for the Asbestos Abatement Plan and meetings shall be considered incidental to the contract.

D. The Contractor shall be responsible for installing his/her own electric panel for abatement activities. An electrician licensed by the Commonwealth of Massachusetts shall perform installation of the electrical panels.

ON-SITE RESPONSIBILITIES

GENERAL REQUIREMENTS

A. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the Work Area in a manner which shall not interfere with construction.

B. Unloading, temporary storage sites, and transfer routes must be approved in advance by the Engineer or District Asbestos Coordinator.

C. Damaged or deteriorated materials or equipment may not be used and must be promptly removed from the premises. Materials, which become contaminated with asbestos shall be packaged and legally disposed of as ACM in an EPA approved, secure landfill.

D. Debris shall not be permitted to accumulate in the work area, and the immediate adjacent areas shall be kept clean. Debris shall be removed from the site and legally disposed of by the Contractor. No disposal shall be made on the property of Commonwealth of Massachusetts or project site. The Contractor shall make his own arrangements for disposal subject to the approval of the Engineer or District Asbestos Coordinator.

ITEM 182.3 (Continued)

E. Contractor's electrical equipment shall be protected by ground fault circuit interrupters (GFCI), which shall be provided by the Contractor.

F. All labor and material costs for connections to existing services, installation of GFCI, temporary lighting, and other work necessary to supply electricity will be the Contractor's responsibility and shall be considered incidental to this contract.

G. The Contractor shall provide electricity, water and sanitary equipment.

H. The Contractor shall coordinate all activities with Department.

I. The Contractor shall perform air monitoring as required to meet OSHA requirements for maintenance of Time Weighted Average (TWA) fiber concentrations for types of respiratory protection provided.

J. Workers will not be allowed to openly carry their respiratory protective equipment outside the Work Area.

K. The Contractor shall provide access and personal protective equipment, with the exception respirators, as necessary, to Department personnel, their representatives or others having authorization to visit the Work Area.

L. It shall be the Department's responsibility or others having authorization to visit the Work Area to provide their own respiratory protective devices, and to ensure that the necessary instructions and training requirements of OSHA Standard 29 CFR 1926.1101 have been met.

FIRE PROTECTION (As Applicable)

A. The Contractor shall supply and maintain an adequate number of fire extinguishers (Class A, B and C) ready for immediate use, and distribute them throughout the work site.

B. Internal combustion engines may not be operated inside any building. No gasoline or other flammable liquids may be stored inside any building nor may any flammable liquids be dispensed or handled within any building.

C. Temporary fire exit signs shall be prominently displayed in the Work Area and to designated exits. Fire exits shall not be locked, chained or restricted in any way so as to prevent exit during an emergency. However, fire exit doorways directly outside the Work Area may be taped or covered with double 6-mil polyethylene plastic sheeting to prevent contamination outside the Work Area. The Contractor shall tape a retractable utility knife adjacent to the fire exit.

ITEM 182.3 (Continued)

SECURITY (As Applicable)

A. The Contractor shall control the point of entry to the Work Area to prohibit unauthorized entry and to log in all workers, and authorized/certified personnel entering and leaving the Work Area. One employee of the Contractor must remain outside of the containment area to maintain control at this point of entry.

B. A log shall be maintained on-site noting entry and exit of all personnel. A copy of this log shall be made available to the Engineer at the completion of the Contractor's asbestos abatement work. The log shall be available for inspection by the Engineer, District Asbestos Coordinator or ACF upon request. .

C. The Contractor shall keep the Work Area secure from unauthorized entry during the time when the Contractor is not on site.

D. Under no circumstances shall workers appear outside of containment wearing respirators and asbestos-related protective clothing.

MATERIALS AND EQUIPMENT

A. Negative Air Machines - The Contractor shall supply an adequate number of HEPA air filtration units to the site to produce airflow meeting Federal and State standards.

B. Respiratory Protection Equipment - The Contractor shall supply the necessary respiratory protection equipment (approved by the National Institute for Occupational Safety and Health [NIOSH]) as required for this project in accordance with Work Area Protection specified under Project Procedures.

C. Polyethylene Plastic Sheeting - All polyethylene plastic sheeting shall be a minimum thickness of 6-mil and be fire retardant.

D. Surfactant (Amended Water) - All water used for removal and wet wiping of asbestos contaminated materials during cleanup operations shall be amended through the addition of a surfactant.

E. Encapsulant - All surfaces from which asbestos-containing materials have been removed shall be sealed with an approved encapsulant, mixed and applied in accordance with manufacturer's instructions. The encapsulant must be compatible with any installation of new material or finishes. The proposed brand and product shall be submitted to the Engineer or District Asbestos Coordinator for approval.

F. Waste Containers - Provide labeled 6-mil polyethylene bags and/or fiber drums labeled with the appropriate warnings in accordance with Federal regulations, and identifying the waste generator and the generator's location.

ITEM 182.3 (Continued)

G. Miscellaneous Material and Equipment - All other materials to be used on the project (i.e., duct tape, spray glue, expanding foam, ladders, power tools, brushes, etc.) should be in good working order and considered to be industry standard.

POST ASSIGNMENT RESPONSIBILITIES

It is a condition of final payment for this Contract that the Contractor provides the Engineer with original or notarized copies of waste manifests or detailed landfill receipts signed by the landfill operator demonstrating disposed of properly. In addition, the ACF shall be provided with copies of employee certifications, training, medicals and fit tests, accident reports, on-site job logs, and personal air monitoring results for inclusion in the assignment report.

BASIS OF PAYMENT

Item 182.3 will be paid for at the Contract Lump Sum unit price, which price shall include full compensation for confirmatory surveys of structures to be demolished for asbestos identification, necessary permits, insurance, and all equipment, labor, mobilization costs, for personnel protection air monitoring, and all incidental costs related to abatement work and for materials needed to complete the abatement work in a workmanlike manner and to legally dispose of all debris. Final clearance testing in accordance with all regulations shall be provided by Mass Highway. The initial testing fail, cost for subsequent re-cleaning and testing shall be incidental to this Item without additional compensation.

All asbestos materials removed shall be disposed of as asbestos-containing waste in accordance with all applicable regulations. All other debris shall be disposed of in accordance with applicable regulations.

ITEM 183.1 TREATMENT OF CONTAMINATED GROUNDWATER GALLON

This Item addresses the treatment and disposal of contaminated groundwater encountered during excavation operations. The work generally consists of furnishing the materials, equipment, labor, services, testing/sampling, waste characterization, transportation, disposal, permits and agreements necessary to perform the work required for the collection, treatment and disposal of contaminated groundwater.

The Contractor is advised that contaminated groundwater may be encountered during dewatering activities. The levels and nature of contamination may vary depending on location and/or depth. No data has been provided in this specification indicating the types of contaminants that may be found in groundwater encountered during this work. It will be the responsibility of the Contractor to ensure that water removed during dewatering operations is treated and disposed of in accordance with all applicable laws and regulations and in accordance with this specification.

The Contractor shall monitor the quantity of groundwater collected for treatment using an in-line totalizer flowmeter or an alternate method approved by MassDOT. The Contractor shall, at all times, minimize the quantity of groundwater removed from the excavations. All groundwater determined to be contaminated will be managed in accordance with all applicable local, state and federal regulations.

It is not the intent herein for the Department to design for or specify to the Contractor which particular treatment is to be used, if necessary. Rather, it is the Department's intent to provide guidance to the Contractor for informational and bidding purposes only. It is, therefore, the Contractor's responsibility to use a treatment method to allow him/her to meet any and all laws, regulations, policies, guidelines and permit requirements. Treatment of contaminated groundwater for dewatering operations is generally performed using a mobile treatment trailer equipped with one or more granular-activated carbon (GAC) canisters, although other techniques are also used.

It is likely that treatment of the contaminated groundwater using granular-activated carbon will be required to complete the work under this Contract. The Methods described under Item 183.1 provides for the identification, testing, management and treatment or disposal of contaminated groundwater and shall be implemented, at a minimum and as necessary by the Contractor via Methods under Item 183.1.

The overall handling and management of contaminated groundwater is regulated under the provisions of 310 CMR 40.0000, 314 CMR 3.00 and 5.00, NPDES and other applicable laws. The unpermitted discharge of contaminated dewatering effluent into the environment (storm drain, surface water body, onto the ground) is a violation of federal and state laws and regulations. Should dewatering of contaminated groundwater be necessary, approvals must be sought from the appropriate federal, state, or local regulatory jurisdiction. The USEPA will not specify a treatment system or method, but normally requires that the treated discharge meet Massachusetts Drinking Water Standards.

ITEM 183.1 (Continued)

The discharge standards are normally met by treating the dewatered groundwater through granular-activated carbon canisters, or similar techniques. Longer term discharges to surface waters or storm drains, and any discharges to the ground, require approval and/or issuance of a permit from the DEP Division of Water Pollution Control. The Contractor shall be responsible for applying for, paying all fees for and obtaining all permits required for treatment and/or disposal of contaminated groundwater. Additional requirements may be mandated by local/regional sewer authorities for discharge to sanitary sewer or Publicly Owner Treatment Works (POTW). Copies of permit applications and correspondence from federal and state agencies and sewer authorities shall be supplied to the Engineer prior to dewatering activities.

EPA regulations published in the Federal Register on September 9, 2005 (70 FR 53663) require a National Pollutant Discharge Elimination System (NPDES) Remediation & Miscellaneous Contaminated Sites General Permit (RGP) for all contaminated construction site dewatering activities in Massachusetts (MAG910000) that will involve the discharge of water to classes of receiving waters designated in the Massachusetts Water Quality Standards (314 CMR 4.00). The application requires that operators of proposed new discharges seeking coverage under this general permit submit a Notice of Intent (NOI) to EPA New England post-marked at least 14 days prior to commencement of discharge. The Contractor is solely responsible for applying for and obtaining coverage under the NPDES Remediation General Permit from EPA and, if applicable, DEP, including the costs associated with sampling and analysis of groundwater and any application fees. The Contractor is required to submit a completed copy of the NOI to the Engineer and the Director of Environmental Programs, Construction Division, 10 Park Plaza, Boston, prior to commencement of discharge.

Upon permanent cessation of the discharges authorized by the RGP, the Contractor shall be responsible for submitting a Notice of Termination (NOT) to EPA New England within 30 days of the permanent cessation. The Contractor is required to submit to MassDOT a completed copy of the NOT within 14 days of the permanent cessation of the discharges authorized by the RGP. All costs and fees associated with the submission of the NOT will be the responsibility of the Contractor.

The Contractor shall be responsible for adhering to regulations, specifications, and recognized standard practices related to contaminated groundwater handling during dewatering activities. MassDOT shall not be responsible at any time for the Contractor’s violation of pertinent local, state or federal regulations or endangerment of laborers and others. The Contractor shall comply with all rules regulations, laws, permits and ordinances of all authorities having jurisdiction including, but not limited to, Massachusetts Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (EPA), Federal Department of Transportation (DOT), Massachusetts Water Resources Authority (MWRA), the Commonwealth of Massachusetts and other applicable local, state and federal agencies governing this work.

ITEM 183.1 (Continued)

The Contractor shall be responsible for determining compliance with the requirements of any permit and for any sampling, testing, and disposal required in connection with said permits. MassDOT and the City/Town reserve the right to collect additional samples of dewatered groundwater to determine the Contractor's compliance with the Permit's requirements. All laboratory testing is to be performed by a DEP certified laboratory for all parameters being tested. Copies of all field and laboratory testing results, reports, etc. required by the permits must be supplied to the Engineer. MassDOT, DEP, and the permit-granting agency, where applicable, reserve the right to collect additional samples of discharged groundwater to verify compliance with permit requirements.

For the purpose of these specifications and to establish a basis for the bid, it is anticipated that granular-activated carbon will be the treatment medium for dewatered contaminated groundwater. The bidder shall factor into the payment item all costs associated with the testing and analyses that may be required by the permitting agency. In addition, any laboratory testing of groundwater is to be performed by a DEP certified laboratory for the parameters being tested. Copies of all field and laboratory testing results will be supplied to the Engineer. Bid price shall also include full compensation for labor, materials, maintenance, mobilization, rental and other related costs. Item 183.2 will be used for disposal of used granular-activated carbon canisters.

SUBMITTALS

Prior to initiating work, the Contractor shall submit an excavation dewatering plan to the MassDOT that includes a detailed description of the approach to dewatering, a description of methodology for sealing the excavation to minimize infiltration of groundwater, if deemed applicable to the work, anticipated treatment, discharge points, sampling frequency, required permits, transporters and waste facilities complete with license numbers, permit numbers, contact person, and address and telephone number that the Contractor plans to utilize for waste disposal. The plan shall be submitted for the record.

The Contractor shall submit to MassDOT for review, the proposed methods for dewatering and groundwater treatment and disposal for the various portions of the work to be done. The review shall be for methods only. The Contractor shall remain responsible for the maintenance, performance, structural integrity and safety of the systems installed for this work as well as regulatory compliance of the applicable local, state and federal discharge standards. The Contractor shall provide all groundwater sampling and analyses, results and reports required by all applicable local, state and federal agencies. The Contractor shall submit to MassDOT for review all plans and documents that must be submitted to the EPA and DEP, including NOI, NOT, treatment system analytical reports and correspondence. Copies of all permits and approvals and lab analyses and test results associated with groundwater treatment and disposal must be submitted to MassDOT within 3 days of receipt by the Contractor.

ITEM 183.1 (Continued)

ESTABLISHMENT OF TREATMENT PROCEDURE

Since concentrations of contaminants in groundwater cannot be easily assessed in the field, all groundwater extracted from the ground will be considered contaminated and will be initially pumped and stored into open settling tank(s) or a fractionation tank until it can be sampled and analyzed, unless otherwise directed by MassDOT. The Contractor will perform initial sampling and analyses of the groundwater to determine the need for a permit to dispose of contaminated groundwater. Based on the results of the initial sample analysis, which must be provided to the Engineer within twenty-four (24) hours of the time the samples are received by the laboratory, the Contractor will determine the necessity for treatment(s) and disposal procedures. Sampling must also be performed to meet applicable discharge criteria as set by the appropriate regulatory agencies for the permit obtained for disposal. All discharges must meet regulatory standards set forth in the permits required for discharge. For the purposes of the bidding process, it is anticipated that the treatment system will consist of sedimentation tanks, an oil water separator and liquid-phase granular activated carbon as the primary on-site treatment medium for dewatered contaminated groundwater. MassDOT may require additional treatment processes if such is determined necessary during the groundwater testing procedure. The Contractor shall integrate the additional treatment process into the treatment system, if necessary.

The Contractor shall provide all labor, equipment and appurtenances required to treat the groundwater, subject to the approval of MassDOT. Groundwater stored and tested but not requiring treatment or off-site disposal shall be discharged to a location subject to the approval of MassDOT without payment to the Contractor.

TREATMENT UNITS

The Contractor shall furnish all labor and materials, and shall install and operate temporary groundwater treatment and disposal system(s) as necessary to treat contaminated groundwater pumped from excavations during construction activities under the Contract. Such systems shall be capable of treating groundwater to meet applicable discharge criteria as set by the appropriate regulatory agencies.

The Contractor or their Environmental Consultant shall operate, maintain and modify the selected treatment system, and conduct the necessary monitoring and reporting of influent, midpoint and effluent results, as required by the discharge permit for the disposal option selected.

ITEM 183.1 (Continued)

METHOD OF MEASUREMENT

Provide a treatment system that meets permit discharge requirements, mobilize it to the site, provide copies of laboratory analytical data indicating that the system is performing appropriately to meet permit requirements, and demobilize it from the site. This includes management and disposal of wastes generated during treatment prior to discharging such as activated carbon, etc. Work under Item 183.1 is based upon the number of gallons disposed or contaminated groundwater pumped through the granular-activated carbon (Item 183.2) as the medium for the treatment of contaminated groundwater that is found in pipe trenches, manhole excavations, catch basin excavations, that need to be dewatered.

BASIS OF PAYMENT

Payment will be made at the unit price bid per gallon of groundwater pumped, stored, treated as needed and tested as required by discharge permits and regulatory requirements, which price shall be full compensation for all necessary labor and materials, mobilization, maintenance, demobilization of the appropriate unit(s), freight, rental costs, field and laboratory testing costs and permits. Costs associated with the disposal of granular-activated carbon shall be covered under Item 183.2.

ITEM 183.2 **DISPOSAL OF GRANULAR ACTIVATED CARBON** **POUND**

GENERAL

Work under Item 183.2 is based upon the disposal of used granular-activated carbon as the treatment medium for contaminated groundwater (Item 183.1) that is found during excavations in which contaminated groundwater is encountered.

BASIS OF PAYMENT

Payment will be made at the unit price bid per pound of carbon that is properly disposed and replaced, as necessary, to meet treated water discharge requirements during dewatering operations at the site. Payment for Disposal of Granular Activated Carbon shall include compensation for all labor, equipment, materials, permits, characterization, sampling and on-site or laboratory analysis as needed or required by permits, for replacement and disposal of liquid-phase activated carbon for the on-site contaminated groundwater pumping, collection, treatment and treated water discharge system during the time period required to complete the work. No payments shall be made for replacing carbon which is spent due to the Contractor's failure to remove floating petroleum product or excess sediments prior to the groundwater entering the carbon treatment units. All other costs associated with treatment of contaminated groundwater will be covered under Item 183.1- Treatment of Contaminated Groundwater.

ITEM 201. CATCH BASIN EACH
ITEM 202. MANHOLE EACH

The work under these items shall conform to the relevant provisions of Subsection 201 of the Standard Specifications and the following:

Catch basins and manholes shall be precast with flat top units (not conical or offset) designed for HS-25 loading, with shop drawings that establish in writing that this requirement is met submitted to the Engineer for acceptance.

Installation of catch basins and manholes and the opening locations in the flat tops shall be coordinated with the offset location and sequencing of moment slab construction where they are installed within or adjacent to moment slabs. The wall section and a portion of the flat top of catch basins installed adjacent to moment slabs will be positioned under the moment slab with the opening for the grate positioned at edge of moment slab curb line. Grade adjustment masonry shall be installed from bottom of frame to the flat top surface to complete the installation. Frames for catch basins at curb line locations shall be 3-flange.

ITEM 210.1	**SANITARY SEWER MANHOLE MUNICIPAL STANDARD**	**EACH**
ITEM 210.11	**SANITARY SEWER MANHOLE MUNICIPAL STANDARD - DOGHOUSE**	**EACH**
ITEM 212.	**TEMPORARY SANITARY SEWER BYPASS**	**LUMP SUM**
ITEM 220.9	**SANITARY STRUCTURE ABANDONED**	**EACH**

The work under these items shall conform to the relevant provisions of Subsection 201 of the Standard Specifications and the following:

The work under these items is required to account for a conflict of an existing 15" VCP sanitary sewer pipe with proposed Wall 1 soldier pile foundations and for the earthwork that is anticipated for the Contractor to access the work area and construct the proposed abutment extension at Bridge No. S-24-016.

Manholes shall be constructed in accordance with the Springfield Water and Sewer Commission Standard Details Ver 4 – November 2020, Revised: August 12, 2021. (See Document A00884). Manholes shall be precast and conform to Standard Detail S-02.0 and associated reference details. Manhole frames and covers for the standard manholes shall conform to Standard Details S-02.55 and/or S-2.56 and S-02.62, respectively. The manhole frame and cover in Armory Street shall be lock-down conforming to Standard Detail S-02.65. The doghouse manhole in Armory Street shall be comprised of precast units with a cast in place bottom slab and the invert constructed in conformance with Standard Detail S-02.66.

Materials shall be in accordance with Springfield Water and Sewer Commission Material Specifications Version 4. (See Document A00883).

The Contractor shall submit shop drawings for all work under these items to the Springfield Water and Sewer Commission for approval.

The proposed doghouse manhole in Armory Street shall be constructed as soon as possible in Stage 1 in coordination with soldier pile foundation construction. Following completion of the manhole existing sanitary sewer flow shall be temporarily re-routed with a bypass from the new manhole to the existing sanitary sewer manhole downstream beyond the wall. The route and method of bypass shall be proposed by the Contractor to facilitate construction of Wall 1 and other work in the area. The Contractor is also responsible for providing power, protection and monitoring of the bypass to ensure that the installation safely operates. The Contractor shall submit proposed bypass plans including all provisions proposed for its operation and protection to the Springfield Water and Sewer Commission and obtain approval prior to commencing bypass work.

The existing sanitary sewer manhole in Armory Street labeled as EX1 in the Plans shall be abandoned by removing and disposing the frame and cover and removing the top four feet of the structure. Abandoned sanitary sewer pipe shall be bulkheaded at both ends with masonry bricks or blocks and sealed with non-shrink grout.

ITEMS 210.1, 210.11, 212., and 220.9 (Continued)

The disposition of sanitary sewer structure remaining shall be subject to approval by the Springfield Water and Sewer Commission. No abandonment work shall commence until SWSC approval is obtained for the means and methods of abandonment proposed by the Contractor.

METHOD OF MEASUREMENT

Items 210.1 and 210.11, Sanitary Sewer Manhole Municipal Standard and Sanitary Sewer Manhole Municipal Standard – Doghouse, respectively, will be measured for payment by the unit each, including frames, covers, and invert brickwork, complete in place and approved by SWSC.

Item 220.9, Sanitary Structure Abandoned, will be measured for payment by the unit each, complete, following approval by the Springfield Water and Sewer Commission.

BASIS OF PAYMENT

Item 210.1, Sanitary Sewer Manhole Municipal Standard and Item 210.11, Sanitary Sewer Manhole Municipal Standard – Doghouse, will be paid at the contract bid price each, which price shall be full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

Item 212., Temporary Sanitary Sewer Bypass, will be paid at the contract lump sum price, with 50 percent of payment made after the bypass (or first of multiple bypasses) is functioning and 50 percent payment made after the bypass is removed. No additional payment will be made for multiple bypasses or for multiple methods of bypass. Payment shall be full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

Item 220.9, Sanitary Structure Abandoned, will be paid at the contract unit bid price each, which price shall be full compensation for all labor, materials, equipment, and incidental costs required for the work.

ITEM 250.15 15 INCH POLYVINYL CHLORIDE SANITARY SEWER PIPE FOOT

The work under this item shall conform to the relevant provisions of Subsection 230 of the Standard Specifications and the following.

Sewer pipe shall conform to the Springfield Water and Sewer Commission Material Specifications Version 4. (See Document A00883). The Contractor shall submit shop drawings to the Springfield Water and Sewer Commission (SWSC) for review and approval.

Sewer pipe shall be installed in conformance with the SWSC Standard Details, Ver 4 – November 2020, Revised: August 12, 2021 (see Document A00884), Standard Detail S-01.0.

METHOD OF MEASUREMENT

Item 250.15, 15 Inch Polyvinyl Chloride Sanitary Sewer Pipe, will be measured for payment by the foot of the sanitary sewer pipe installed, complete and accepted by the SWSC.

BASIS OF PAYMENT

Item 250.15, 15 Inch Polyvinyl Chloride Sanitary Sewer Pipe, will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment, excavation, bedding, backfill, bends, fittings, lubricant, cutting, beveling or jointing, and all incidental costs required to complete the work.

ITEM 302.122	**12 INCH DUCTILE IRON WATER PIPE CLASS 56**	**FOOT**
ITEM 303.06	**6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**
ITEM 303.08	**8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**
ITEM 303.12	**12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**
ITEM 309.	**DUCTILE IRON FITTINGS FOR WATER PIPE**	**POUND**
ITEM 325.18	**18 INCH STEEL PIPE CASING FOR WATER PIPE**	**FOOT**
ITEM 347.2	**2 INCH COPPER TUBING TYPE K**	**FOOT**
ITEM 348.1	**1 INCH COPPER PIPE TYPE L**	**FOOT**
ITEM 348.2	**2 INCH COPPER PIPE TYPE L**	**FOOT**
ITEM 350.06	**6 INCH GATE AND GATE BOX**	**EACH**
ITEM 350.08	**8 INCH GATE AND GATE BOX**	**EACH**
ITEM 350.12	**12 INCH GATE AND GATE BOX**	**EACH**
ITEM 357.12	**12 INCH GATE BOX**	**EACH**
ITEM 358.	**GATE BOX ADJUSTED**	**EACH**
ITEM 363.1	**1 INCH CORPORATION COCK**	**EACH**
ITEM 363.2	**2 INCH CORPORATION COCK**	**EACH**
ITEM 371.06	**6 INCH COUPLING**	**EACH**
ITEM 371.08	**8 INCH COUPLING**	**EACH**
ITEM 371.12	**12 INCH COUPLING**	**EACH**
ITEM 373.12	**12 INCH WATER PIPE INSULATION**	**FOOT**
ITEM 373.18	**18 INCH WATER PIPE INSULATION**	**FOOT**
ITEM 379.2	**2 INCH AIR VALVE ASSEMBLY**	**EACH**
ITEM 381.01	**SERVICE BOX (MUNICIPAL STANDARD)**	**EACH**
ITEM 381.3	**SERVICE BOX ADJUSTED**	**EACH**
ITEM 384.	**CURB STOP**	**EACH**

The work under these Items shall conform to the relevant provisions of Subsection 301 of the Standard Specifications, the requirements of the Springfield Water and Sewer Commission, and the following:

The work under these items shall include all labor, materials and equipment necessary to make alterations to existing water mains and to install new water mains including pipe, pipe fittings, insulation, casings, sleeves, spacers, restrained joints, thrust blocks, plugs, caps, valves, water service connections and hydrant removal.

Also included is all labor, materials, and equipment to provide uninterrupted water distribution throughout construction including all temporary work required for disinfection and testing. All active gate boxes and service boxes within the limits of construction to remain shall be adjusted, as required, to be flush with temporary and proposed grades. If any of the existing castings, fittings, or valves that are intended to be adjusted or reused are found to be unfit for continued use as determined by the Engineer, the Contractor shall remove and discard this material and furnish and install new materials of the same size and type under the appropriate items. All valves on abandoned sections of pipe shall have their gate boxes completely removed and the cavity filled.

ITEMS 302.122 through 384. (Continued)

GENERAL

Existing water mains shown on the plans have been compiled from available record information. This information is not guaranteed to be exact, and the Contractor shall verify the location, size, and type of existing pipes and appurtenances.

The Springfield fire department shall be given notice of the schedule to take each hydrant out of service and when water main shutdowns are scheduled. No work shall commence without the approval of the fire department.

Springfield Water and Sewer Commission Coordination

The Contractor shall coordinate the work with the Springfield Water and Sewer Commission (Commission). No mains, services, or hydrants shall be shut off or worked on without authorization of the Engineer and at least 72 hours' notice shall be given to the Commission prior to the start of work under these items. Valves shall be operated by Commission personnel only.

Materials shall be new, conforming to material noted on the plans and to the Springfield Water and Sewer Commission, Material Specifications, Version 4, November 2020, which are provided in the under Document A00883.

Shop drawing material submissions will require Commission approval. Shop drawings for all water works materials shall be submitted to the engineer in accordance with the additional submission requirements as stipulated in the Commission's Materials Specification.

In addition to details included in the plans the Contractor shall install water works in accordance with the Commissions Standard Details, Version 4 – November 1, 2020, Revised: August 12, 2021, which are provided under Document A00884.

In addition to the requirements for execution of the work described herein the Contractor shall conduct the work in accordance with the Commissions Guidelines and Policies, Version 4 – November 1, 2020, which are provided under Document A00885.

Existing water main that is supported on the bridges shall be removed and discarded under the bridge demolition items. The removed water main shall include all materials including but not limited to fittings, valves, jacketing, spacers and casings. Existing water main and all appurtenances requiring removal in locations off the bridges shall be removed and the cavities filled, incidental to the water works items.

ITEMS 302.122 through 384. (Continued)

New air release assemblies shall be installed at the locations noted on the plans subject to field adjustment as may be required by the Commission on the new water pipe that is to be installed above ground on structural supports. The standard Commission detail for air release assemblies shall be modified as noted and/or as directed by the Commission. At bridge S-24-016 the pipe supports approaching gravity block 2 shall be adjusted to attain an approximate level pipe installation such that the air release may be installed near gravity block 2. At bridge S-24-026 the insulated carrier pipe tee, cap, watertight gasket, and air valve assembly noted on the plans shall be detailed on a shop drawing submission by the Contractor and submitted to the Commission for approval. The carrier pipe tee and cap shall be incidental to the cost of the carrier pipe. The insulation configuration shall be included in the cost of the carrier pipe insulation.

Expansion joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material properties of ANSI/AWWA C153/A21.53. Each expansion joint shall be capable of expanding or contracting no less than 4" total axial movement. Separation beyond the maximum extension of the expansion joint shall be prevented without the use of external tie rods. Each expansion joint shall be pressure tested against its own restraint to a minimum of 350 psi. The mechanical joint restraints shall meet the Material Specifications as outlined in Document A00883. All pressure containing parts shall be lined with a minimum of 15 mils of fusion bonded epoxy, conforming to the applicable requirements of ANSI/AWWA C213, and shall be tested with a 1500-volt spark test conforming to the stated specification. Shop drawing submission of the expansion joints with the above-noted requirements explicitly stated shall be made to the Commission for review and approval.

New water pipe supported on the walls and bridges shall be ductile iron Class 56 to the approximate limits shown on the water main profile. All other ductile iron water pipe, including the vertical transitions on the gravity blocks and the underground locations shall be mechanical joint Class 52. All water pipe and fittings shall be restrained and pipe sections running the length of Armory Street shall be installed with the bell ends facing southeasterly.

The 18” steel casing pipe shall have a minimum yield strength of 35,000 psi. Joints shall be integrated interlocking with leak resistant seals. The tee fitting shall provide clearance for installation and operation of the air release assembly with a gasketed cap and stainless steel/corrosion resistant bolts. Carrier pipe connection to the tee shall be equal to or better than the carrier pipe joints, subject to SWSC approval.

The containment (casing) pipe spacers to align the water pipe within the casing shall be incidental to the cost of the casing pipe.

The methods of testing and disinfection shall adhere to the requirements of MassDOT Standard Specifications Subsections 301.60.J, Testing and 301.60.K, Disinfection (AWWA Standard Procedure C601), and shall be submitted to the Commission for review and approval. Procedures required by the Commission shall supersede the Standard Specifications Sections cited in the event of any discrepancies. All materials and labor required for testing and disinfection shall be incidental to the total contract bid price. The Commission will review and approve locations of the temporary installations required for the execution of this work.

ITEMS 302.122 through 384. (Continued)

All bolts and other fastenings shall be cast in place in the concrete as opposed to drill and grout.

Support details on the walls and bridges shall allow for final vertical profile adjustment of the pipe after the pipe is initially placed. Following fine tuning of the vertical adjustment the space shall be grouted.

Final acceptance of all water works installations will be subject to approval by the Commission.

AS-BUILT plans shall be prepared by the Contractor for all water work installations. The design engineer will only provide Autocadd files of the pertinent plans for Contractor use, but will not provide certification of the installation. All provisions of the AS-BUILT plan requirements by SWSC shall be Contractor responsibilities.

METHOD OF MEASUREMENT

Items 302.122, 303.06, 303.08, 303.12, 325.18, 347.2, 348.1, 348.2, 373.12, and 373.18 will be measured for payment by the Foot.

Item 309. will be measured for payment by the Pound.

Items 350.06, 350.08, 350.12, 357.12, 358., 363.1, 363.2, 371.06, 371.08, 371.12, 379.2, 381.01, 381.3, 384. will be measured for payment by the Each.

BASIS OF PAYMENT

Items 302.122, 303.06, 303.08, 303.12, 325.18, 347.2, 348.1, 348.2, 373.12, and 373.18 will be paid for at the respective Contract unit prices per Foot, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

Item 309. will be paid for at the Contract unit price per Pound, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

Items 350.06, 350.08, 350.12, 357.12, 358., 363.1, 363.2, 371.06, 371.08, 371.12, 379.2, 381.01, 381.3, 384. will be paid for at the respective Contract unit prices per Each, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

No separate payment will be made for all forms, approvals, inspection costs, licenses and permits, AS-BUILT plans, all costs resulting from SWSC coordination included in their Guidelines and Policies, all excavation, regardless of depth, backfill, bedding, cleaning, testing, disinfection, but all costs in connection therewith shall be included in the Contract unit price bid. (If the Special Provision is for more than one item, include item title and number reference here.)

Appurtenances for the water pipe passing through the bridge abutment backwalls shall be included under the respective bridge lump sum items.

ITEMS 302.122 through 384. (Continued)

Supports, saddles, rollers, bolts, grout, hardware, and all other materials not specifically itemized for payment for the water main installation on the gravity blocks, walls and bridges shall be considered included in the total contract price.

Removal and disposal of existing water works, including inactive gate boxes abandoned water works including those not specifically noted that must be removed to install new work, shall be incidental to the total contract bid price.

The insulated steel tee in the steel casing pipe for accessing the air release assembly shall not be measured for payment, but the cost for all work associated with its fabrication and installation shall be incidental to the cost of the steel containment pipe.

Temporary caps required for construction staging, disinfection and testing will not be measured for payment, but will be considered incidental to the total contract price.

Concrete thrust blocks and gravity blocks shall be installed in accordance with the Commission's Standard Details or as directed and at locations as directed by the Commission, with measurement and payment made under Item 903.

ITEM 458.7 LIGHTWEIGHT AGGREGATE CUBIC YARD

The work under this item shall conform to the relevant provisions of Subsection 150 of the Standard Specifications and the following:

This work includes furnishing and installing Lightweight Foamed Glass Aggregate (UL-FGA) material for backfill at locations and to the limits shown on the Contract Documents.

The Contractor shall furnish all labor, materials, equipment, tools, and appurtenances required to complete the work as specified herein. The work shall further include the following:

1. Storage and handling of UL-FGA.
2. Protection and preservation of all existing utilities and structures.
3. Placement of geotextile wrap at locations indicated on the Contract Drawings.
4. Removal and legal disposal of all excess material resulting from the work specified herein.

MATERIALS

Lightweight Foamed Glass Aggregate

Lightweight Foamed Glass Aggregate (UL-FGA) shall be manufactured from of a minimum of 98% recycled glass and shall be produced from a dry-mixing process.

The UL-FGA shall consist of particles exhibiting a non-leaching, closed cell structure and shall meet the following gradation requirements:

SIEVE SIZE	TOTAL PERCENT PASSING
4 inch	100
2 ½ inch	85 – 100
3/8 inch	0 - 15

The UL-FGA shall meet the following chemical requirements:

REQUIREMENTS	CRITERIA	TEST METHODS
Loss on Ignition	0%	ASTM C114
Sulfates	< 15 ppm	AASHTO T290
Chlorides	< 10 ppm	AASHTO T291
TCLP	Non-Leaching	SW-846

The as-delivered UL-FGA shall have a maximum dry density no greater than 15 pounds per cubic foot (pcf), as determined by ASTM C-29.

The in-place compacted dry density of the UL-FGA shall not exceed 20 pcf when determined in accordance with the method specified by the Engineer.

ITEM 458.7 (Continued)

Acceptance of Materials

The Contractor shall furnish to the Engineer a Certificate of Compliance issued by a laboratory certified by the product manufacturer, certifying that the UL-FGA material complies with the applicable Contract Specifications. A copy of all test results performed by the Contractor necessary to assure contract compliance shall also be furnished to the Engineer. Acceptance will be based on the Certificate of Compliance, accompanying test reports, and visual inspection by the Engineer.

SUBMITTALS

Material Certification

Prior to material delivery to project site, the Contractor shall provide the Engineer with a written certification or manufacturer's quality control data showing that the product meets or exceeds the requirements specified herein. The Contractor shall also provide the Engineer with documentation that the manufacturer has manufactured a minimum of 100,000 cubic yards (CY) of product meeting the requirements of this Special Provision.

UL-FGA Sample

At Engineer's request, provide a 25-pound (LB) control sample of the UL-FGA material for every 200 CY delivered on site.

CONSTRUCTION METHODS

Delivery, Storage and Handling

Deliver, store, and handle materials in accordance with manufacturer's recommendations.

During all stages of manufacture, shipment, storage, and construction, minimize the amount of material moves to prevent particle breakage and physical damage. Minimize traffic on foamed glass aggregate until an adequate thickness of cover material is placed over the foamed glass aggregate.

Placement

The area work shall be free of standing water, ice, or foreign loose particles.

Install first separation geotextile fabric at required locations shown on the Contract Drawings.

Spread UL-FGA material in lifts of even thickness in backfill areas shown on the Contract Drawings. Do not operate construction equipment, other than equipment required for placement and compaction, on the exposed surface of UL-FGA to minimize breakage of UL-FGA particles and over-compaction of the fill.

ITEM 458.7 (Continued)

Construction equipment, other than required for placement and compaction, shall not operate on the exposed foamed glass aggregate to minimize breakage and over-compaction of the foamed glass aggregate.

For compaction using tracked equipment, spread UL-FGA in uncompacted lift thicknesses of 24 inches. Compact UL-FGA using a tracked excavator or dozer with ground pressures of 625 to 1,025 psf. Compaction shall then be attained by lifting the blade or bucket and traveling over the layer for a total of four (4) full passes. One (1) full pass shall be defined as a minimum of 100% coverage of the tracks passing over the top of the lift.

In areas not accessible by tracked equipment (e.g., around structures, utilities or due to vertical clearance or horizontal restrictions) UL-FGA shall be placed in maximum uncompacted lifts of 12 inches and compacted with a plate compactor weighing 110 to 220 LBs. Compaction shall be complete after a minimum of four (4) full passes with the plate compactor. One (1) full pass is defined as a minimum of 100% coverage of the plate passing over the top of the lift.

Alternative forms of installation and compaction shall be as recommended by the manufacturer and approved by the Engineer through submittal.

Upon Engineer's approval, compaction requirements in areas not subjected to highway loading or in other areas designated in Contract Documents may be reduced.

A geotextile shall be placed as a separator between subgrade and the initial lifts of UL-FGA, as well as above the final lift and on side slopes to provide separation between the UL-FGA material and adjacent soil and capping layer. Care should be taken during placement of capping layer to prevent damage to geotextile. Adjacent panels of geotextile shall be sewn together or overlapped a minimum of 12 inches. The geotextile shall not be left exposed for longer than 14 days, or as otherwise recommended by the geotextile manufacturer.

Where required, exposed UL-FGA surfaces shall be protected against direct contact with excessive traffic using plywood, steel plates or similar forms of protection. All and any ruts deeper than four (inches) shall be backfilled with new foamed glass material compacted with four (4) full passes with a 110 to 220 lb plate compactor.

Geotextile Fabric for Separation shall be installed in accordance with the Manufacturer's recommendations and Subsection M9.50.0 of the Standard Specifications.

ITEM 458.7 (Continued)

METHOD OF MEASUREMENT

Item 458.7 will be measured by the Cubic Yard of lightweight aggregate installed, complete in place. Measurements will be taken to the nearest tenth of a cubic yard.

BASIS OF PAYMENT

Item 458.7 will be paid for at the Contract unit price per Cubic Yard, which price shall include all labor, materials, tools, equipment, staging, access, removals, storage, the cost of all field measurements and survey required, and incidental costs required to complete the work.

No separate payment will be made for Geotextile Fabric for Separation, but all costs in connection therewith shall be included in the unit price bid.

ITEM 590. CURB REMOVED AND STACKED FOOT

This item shall conform to the relevant provisions of Subsection 580 of the Standard Specifications and the following.

Surplus existing curb in good condition, following removal and installation of proposed curb, shall be removed off the site and neatly stacked on wooden pallets and delivered to the municipal facility designated by the City of Springfield.

METHOD OF MEASUREMENT

Item 590. will be measured for payment by the foot of curb removed and stacked at the municipal facility.

BASIS OF PAYMENT

Item 590. will be paid at the contract unit price per foot, which price shall be full compensation for all labor, materials, equipment, transportation, and incidental costs required to complete the work.

ITEM 620.33 GUARDRAIL – CURVED,TL-3 (SINGLE FACED) FOOT

This item shall conform to the relevant provisions of Subsection 601 of the Standard Specifications, Supplemental Specifications, and the following:

Post spacing shall be 3'-1 ½" on center for all curved guardrail.

Curved guardrail shall be thrie beam.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 620.33 will be measured and paid per Subsections 601.80 and 601.81, respectively.

ITEM 627.2 GUARDRAIL ROUNDED END UNIT EACH

This item shall conform to the relevant provisions of Subsection 601 of the Standard Specifications and the following:

The guardrail rounded end unit shall conform to the intent of the rounded end unit detail on Construction Standard Detail 627.1.1, modified for Thrie-beam.

The guardrail rounded end unit shall be installed where noted on the plans attached to the end of the curved Thrie-beam guardrail section.

METHOD OF MEASUREMENT

Item 627.2 will be measured for payment by each unit installed, complete in place.

BASIS OF PAYMENT

Item 627.2, Guardrail Rounded End Unit, will be paid at the contract unit price per EACH, which price shall be full compensation for all labor, materials, equipment, and incidentals required to complete the installation.

ITEM 628.24 TRANSITION TO BRIDGE RAIL EACH

This item shall conform to the relevant provisions of Subsection 601 of the Standard Specifications, Supplemental Specifications, and the following.

The proposed guardrail detail connecting between the standard MassDOT concrete highway guardrail transitions and the beginning of the curved guardrail installations at the Genessee St./Warwick St. intersection and at the Taylor St intersection shall be constructed and paid for under this item. The guardrail installation shown on the MassDOT Standard Construction Detail 628.24.1, Transition to Bridge Rail (Back of Sidewalk), must be modified in length and post spacing to account for the actual length of guardrail transition needed at these two locations, extending from the standard guardrail connection at the concrete unit to the PC of the proposed curved guardrail. The modifications shall include the installation of additional posts and offset blocks, guardrail (nested as required), guardrail section lengths, offset block and post connections, and guardrail hardware connections, with the spacing for additional post(s), as required, to be 3'-1 ½" (max) or less.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 628.24 will be measured and paid per Subsections 601.80 and 601.81, respectively.

ITEM 645.172 72 INCH CHAIN LINK FENCE (PIPE TOP RAIL) VINYL COATED (LINE POST OPTION) FOOT

Work under this Item shall conform to the relevant provisions of Subsection 644 of the Standard Specifications and the following:

Proposed line post section shall match the existing chain link fence line posts to which these installations match.

All post foundations shall be concrete.

ITEM 657. TEMPORARY FENCE FOOT
ITEM 657.5 TEMPORARY FENCE REMOVED AND RESET FOOT

Work under these items shall conform to the relevant provisions of Subsection 644 of the Standard Specifications and the following:

Temporary fence, including foundations, moveable foundations, and supports, shall be furnished, installed, maintained, removed and reset to new work areas, and removed from the project under these items.

Temporary fence shall be six (6) feet high, with top and bottom spring tension wire, chain link fabric, hardware conforming to MassDOT construction standard details, and shall be either new or used in good condition. Materials that are not acceptable to the Engineer shall be removed and replaced at no additional compensation.

Temporary fence shall be installed at the locations shown or noted on the plans, as noted on the detail sheets, as required for work site safety or as directed by the Engineer. The fence shall be erected to secure the area effected before other work commences in the same area. Temporary fence shall include gates, where noted or required for access and as may be requested by the Engineer, with locks as required for security.

Posts shall be spaced at 10 feet maximum.

Temporary fence, including foundations, shall be removed from initial installation locations as soon as practicable and reset to new locations to secure the work site as needed. Additional temporary fence under Item 657. shall not be acquired before temporary fence already on site is reset unless authorized by the Engineer to satisfy security and safety concerns.

Temporary fence, including foundations, shall be removed from the project after work is complete in the area secured by the fence or as required for final grading, for accommodation of project installations or project clean up, as authorized by the Engineer. Areas disturbed by fence removal shall be restored, incidental to the work under this item.

METHOD OF MEASUREMENT

Item 657. and Item 657.5 will be measured for payment by the Foot of temporary fence, including gates.

BASIS OF PAYMENT

Item 657. and Item 657.1 will be paid for at the respective Contract unit prices per Foot, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

No separate payment will be made for all posts including end, corner, and intermediate brace posts, all gates and gate posts, removing and resetting of temporary fence for the convenience of the Contractor, the replacement and/or restoration of fence damaged due to construction accidents, vandalism and/or any other manner, and final removal, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 665. CHAIN LINK FENCE REMOVED AND STACKED FOOT
ITEM 671. FENCE GATE AND GATE POSTS REMOVED AND STACKED EACH

Work under these Items shall conform to the relevant provisions of Subsection 665 of the Standard Specifications and the following:

Existing black vinyl coated chain link fence at 83-95 Warwick Street that is located along the frontage of Armory Street and Warwick Street and noted to be removed and stacked shall be removed and stacked at the owner's designated location.

Existing chain link fence at 176 Armory Street noted to be removed and stacked shall be removed and stacked at the owner's designated location at the same address.

The existing chain link fence gate at 176 Armory Street noted to be removed and stacked shall be removed and stacked at the owner's designated location at the same address.

ITEM 697.1 SILT SACK EACH

Work under this item shall conform to the relevant provisions of Subsections 227 and 670 of the Standard Specifications and the following:

The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

CONSTRUCTION

Silt sacks shall be installed in retained existing and proposed catch basins and drop inlets within the project limits and as required by the Resident Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions, and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and disposed of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

When emptying the silt sack, the Contractor shall take all due care to prevent sediment from entering the structure. Any silt or other debris found in the drainage system at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the insert be deposited on site and used in construction.

All curb openings shall be blocked to prevent stormwater from bypassing the device.

All debris accumulated in silt sacks shall be handled and disposed of as specified in Section 227 of the Standard Specifications

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Silt sacks will be measured and paid at the Contract unit price per each, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for removal and disposal of the sediment from the insert, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 698.3 GEOTEXTILE FABRIC FOR SEPARATION SQUARE YARD

The work under this item shall conform to the relevant provisions of Subsections 670, 751, and 767 of the Standard Specifications and the following:

Work under this item includes furnishing and installing geotextile fabric at locations noted on the plans, in the Special Provisions, or as directed by the engineer.

The work shall consist of furnishing and installing approved geotextile filter fabric at the locations and in the manner shown on the plans or as required by the Engineer.

The geotextile fabric shall conform to the requirements of Subsection M9.50.0, and be non-woven.

The fabric shall be installed without puckers on a smoothly graded surface approved by the Engineer and held in place to prevent excessive movement when backfill is placed against it. The fabric shall be laid to allow some movement so that placement of overlaying material does not stretch or tear it. Fabric shall overlap in accordance with details shown on the plans and/or in accordance with the manufacturer's recommendations, but in no case less than twelve (12) inches, with upslope fabric overlapping downslope fabric. After placement the fabric shall not be left uncovered for more than two weeks and traffic, including construction equipment, shall not be permitted directly on the fabric. Fabric shall be completely covered with backfill material of the type required at each installation. Backfill material shall be dropped on to the fabric from a height no greater than three feet. Excess fabric shall be removed from the project.

METHOD OF MEASUREMENT

Item 698.3 will be measured for payment by the Square Yard of geotextile fabric for separation installed, complete in place.

BASIS OF PAYMENT

Item 698.3 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, equipment, sewing and/or overlapping material, and all incidental costs required to complete the work.

ITEM 740. ENGINEER'S FIELD OFFICE AND EQUIPMENT (TYPE A) MONTH

The work under this Item shall conform to the relevant provisions of Subsection 740 of the Standard Specifications and the following:

Three (3) computer systems and printer system meeting minimum requirements set forth below including installation, maintenance, power, paper, disks, and other supplies shall be provided at the Resident Engineer's Office:

All equipment shall be UL approved and Energy Star compliant.

The Computer System shall meet the following minimum criteria or better:

Processor:	Intel, 3.5 GHz
System Memory (RAM):	12 GB
Hard Drive:	500 GB
Optical Drive:	DVD-RW/DVD+RW/CD-RW/CD+RW
Graphics Card:	8 GB
Network Adapter:	10/100 Mbit/s
USB Ports:	6 USB 3.0 ports
Keyboard:	Generic
Mouse:	Optical mouse with scroll, MS-Mouse compliant
Video/Audio	the computer system shall be capable of allow video calling and recording:
Video camera	shall be High Definition 1080p widescreen capable video calling and recording with built in microphone. The microphone system shall capture natural audio while filtering out background noise.
Audio	shall be stereo multimedia speaker system delivering premium sound.
OS:	Latest Windows Professional with all security updates
Web Browser:	Latest Internet Explorer with all security updates
Applications:	Latest MS Office Professional with all security updates Latest Adobe Acrobat Professional with all security updates Latest Autodesk AutoCAD LT Antivirus software with all current security updates maintained through the life of the contract.
Monitors:	Two 27" LED with Full HD resolution. Max. resolution 1920 x 1080
Flash drives:	2 (two) - 128GB USB 3.0
Internet access:	High Speed (min. 24 mbps) internet access with wireless router.

ITEM 740. (Continued)

The Multifunction Printer System shall meet the following minimum criteria or better:

Color laser printer, fax, scanner, email and copier all in one with the following minimum capabilities:

- Estimated volume 8,000 pages per month
- LCD touch panel display
- 50 page reversing automatic document feeder (RADF) (not including the bypass tray)
- Reduction/enlargement capability
- Ability to copy and print 11” x 17” paper size
- email and network pc connectivity
- Microsoft and Apple compatibility
- ability to overwrite latent images on hard drive
- 600 x 600 dpi capability
- 30 pages per minute print speed (color),
- 4 Paper Trays Standard
- Automatic duplexing
- Finisher with staple functions
- Standard Ethernet. Print Controller
- Scan documents to PDF, PC and USB
- ability to print with authenticated access protection

The Contractor shall supply a maintenance contract for next day service, and all supplies (toner, staples, paper) necessary to meet estimated monthly usage.

The Engineer's Field Office and the equipment included herein including the computer system, and printer shall remain the property of the Contractor at the completion of the project. Disks, flash drives, and card readers with cards shall become the property of the Department.

Compensation for this work will be made at the contract unit price per month which price includes full compensation for all services and equipment, and incidentals necessary to provide equipment, maintenance, insurance as specified and as directed by the Engineer.

ITEM 751.7 COMPOST BLANKET CUBIC YARD

The work under this Item shall conform to the relevant provisions of Subsection 751 and M1.06.0 Compost of the Standard Specifications and the following:

Work shall consist of furnishing and pneumatically applying compost as a thin mulch blanket (1/2-1 inch depth) over prepared soil to provide temporary soil stabilization and organic matter for plant growth.

SUBMITTALS AND MATERIALS

No materials shall be delivered until the required submittals have been approved by the Engineer. Delivered materials shall match the approved samples. Approval of test results does not constitute final acceptance.

Contractor shall submit to the Engineer samples and certified test results no sooner than 60 days prior to application of compost. Vender certification that material delivered meets the test results shall be submitted if requested.

Compost shall meet the requirements for M1.06.0: Compost, Type 2, as referenced in the MassDOT– Highway Division Standard Specifications for Highways and Bridges, Division III: Materials Specifications, latest edition.

The Engineer shall approve the Contractor's equipment for application.

CONSTRUCTION METHODS

Application of compost material shall not begin until the Engineer has approved the site and soil conditions. Soil preparation shall be as specified under the applicable item for soil placement or for seeding. The Contractor shall notify the Engineer when areas are ready for inspection and application of compost.

Compost blanket shall be pneumatically applied (blown on) to a minimum depth of one half to one inch. Where shown on the plans or when directed by the Engineer depth may be increased to provide berms for sediment control or to otherwise prevent slope erosion.

When compost blanket is proposed with seeding, seed shall be broadcast and shall occur in conjunction with compost blanket, as specified under the relevant item for seeding.

When compost blanket is proposed for areas with planting, compost (and seed if applicable) shall be applied after planting. If compost and seed occur prior to planting, areas shall be regraded and compost and seed reapplied to the satisfaction of the Engineer and at the Contractor’s expense.

ITEM 751.7 (Continued)

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 751.7 will be measured and paid for at the Contract unit price per Cubic Yard which price shall include all labor, materials, equipment, and all incidental costs required to complete the work of pneumatically applying compost.

Surface preparation of substrate receiving compost blanket shall be compensated under the applicable item for placement of loam, sand, ordinary borrow, wetland soil, topsoil rehandled and spread, tilled existing soil, or other specified substrate.

Seeding, if utilized, will be compensated for under the appropriate seeding item.

ITEM 756. NPDES STORMWATER POLLUTION PREVENTION PLAN LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the EPA for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. The Contractor shall be fully responsible for compliance with the most recently issued CGP and any subsequent revisions. Should a fine or damages be assessed against it, or MassDOT, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a fourteen (14) day review period commencing from the date on which EPA enters the Notice into their database. Based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

The CGP also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The Plan will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. The Contractor shall prepare the SWPPP and update it as necessary. The Contractor shall submit the Plan to the Engineer for approval at least four (4) weeks prior to any site activities. It is the responsibility of the Contractor to comply with the CGP conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to the project and to include in the SWPPP the methods and means necessary to comply with applicable conditions of said permits.

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, regulations, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

ITEM 756. (Continued)

In addition to the CGP requirements for inspections, MassDOT requires inspection of all erosion controls and site conditions on a weekly basis. Inspections are also required at portions of sites that discharge to sediment or nutrient impaired or high quality waters per the CGP when each incidence of rainfall exceeding 0.25 inches in twenty-four hours or after snowmelt discharge from a storm event that produces 3.25 inches or more of snow within twenty-four hours occurs. The CGP requires that inspections be performed by a qualified individual as outlined in the CGP. MassDOT requires proof of completion of a 4 hour minimum sedimentation and erosion control training class current to the latest CGP. This individual can be, but not limited to, someone that is either a certified inspector, certified professional, or certified storm water inspector. The documentation shall be included as an appendix in the SWPPP. The inspector's qualifications shall be submitted to the Engineer for approval prior to beginning any work. This individual shall be on-site during construction to perform these inspections. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. The Standard Specifications require adequate erosion control for the duration of the Contract. All control measures must be properly selected, installed, and maintained in accordance with manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or is no longer adequate, it is the responsibility of the Contractor to replace or modify the control for site conditions at no additional cost to the Department. Contractor must maintain all control measures and other protective measures in effective operating conditions and shall consider replacement of erosion controls for each construction season.

The work under this item shall also include the preparation, submission and implementation of a Flood Contingency Plan. The plan shall address the potential need for the temporary relocation of construction and auxiliary equipment situated within the 1% annual chance of flooding zone to designated upland locations above the Base Flood Elevation during flood events. The Flood Contingency Plan shall address any additional MassDEP-required information requirements, as applicable. The Flood Contingency Plan shall be submitted to the Engineer for review and approval at the same time as the SWPPP.

This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, preparation of monthly reports and Flood Contingency Plan. In addition, any erosion controls beyond those specified in bid items which are selected by the

ITEM 756. (Continued)

Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this item.

The CGP provides specific requirements for temporary and final stabilization. This shall be incorporated into the project schedule. The permit defines specific deadline requirements for Initial Stabilization ("immediately", i.e., no later than the end of the next work day following the day when earth-disturbing activities have temporarily or permanently ceased) and for Complete Stabilization Activities (no later than 14 calendar days after the initiation of stabilization). Stabilization criteria for vegetative and non-vegetative measures are provided in the CGP.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etc. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer's Final Estimate. The permittee shall use EPA's website to prepare and submit the NOT.

BASIS OF PAYMENT

Item 756 will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, SWPPP & Flood Contingency Plan preparation, revisions/addenda during construction, monthly reports, filing fees, and all incidental costs required to complete the work.

Payment of 50% of the Lump Sum price of this item will be made upon acceptance of the NPDES Stormwater Pollution Prevention Plan & Flood Contingency Plan.

Payment of 40% of the Lump Sum price of this item will be will be paid in equal monthly installments distributed across the time remaining in the accepted baseline schedule until substantial completion.

The remaining 10% of the Lump Sum price of this Item will be paid following accepted submission of a Notice of Termination (NOT) when final stabilization has been achieved.

ITEM 765.21 ANNUAL COVER CROP FOR NATIVE SEEDING POUND

Work under this item shall conform to the relevant provisions of Subsection 765 of the Standard Specifications and the following.

DESCRIPTION

Work consists of furnishing and applying the appropriate annual grass to be seeded as a cover crop in conjunction with upland native seeding and at the rate specified herein.

A cover crop shall be used for following conditions:

- when specified under Application Rate for the permanent native upland seed mix
- for slopes 2:1 or steeper and an annual is not already specified as part of the permanent mix
- when seeding out of season and the native seed mix does not already specify an annual
- as required to prevent erosion until the permanent seed establishes.

A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Annual rye (*Lolium multiflorum*) will not be accepted as an annual cover crop.

Using annual rye or exceeding the application rate such that a dense stand of annual grasses prevents germination of the native grasses will require mowing of annual grasses. In this instance, mowing of cover crop will be incidental to this item.

Seed and Application Rate

Add 30 pounds/acre of the following seed based on seeding season:

Avena sativa (Grain Oats):	1 January to 31 July
Cecale cereale (Grain Rye):	1 August to 31 December

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Annual Cover Crop will be measured for payment per pound of seed, complete in place.

Annual Cover Crop will be paid at the contract unit price per pound upon approval of seed bag tags or other documentation of correct application rate and species, and upon acceptance of a satisfactory stand of annual grasses three weeks following seeding.

Application and care of cover crop will be paid for separately under Item 765.635 Native Seeding and Establishment.

ITEM 765.453 WOODLAND EDGE SHADE MIX POUND

Work under this item shall consist of furnishing the mix(es) specified below in the required quantity.

SUBMITTALS

1) Pre-Verification of Seed Availability. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species in the required quantities and for the anticipated date of seeding. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. Species not expected to be available should be noted and substitutions recommended.

2) Final Verification of Seed Availability. No earlier than 21 days prior to ordering, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species and in the required quantities. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section. Substitutions or changes in the mix at this time must be approved by MassDOT Landscape Design Section.

3) Seed Worksheet provided herein shall be submitted to the Engineer prior to ordering seed to determine the number of pounds of Pure Live Seed required.

4) Seed Tags. The Contractor shall submit original seed tags from each bag of seed used on the project or ensure that each tag is photo documented by the Engineer while on the unopened bag.

   Number of tags submitted must correspond to number of bags delivered.

   Species listed on the seed tag shall match the Final Verification of Seed Availability (Submittal #2) unless approved otherwise. Tag must include: variety and species name; lot number; purity; percentage of inert matter; percentage of weeds, noxious seeds, and other crop seeds; germination, dormant or hard seed; total viability; origin of seed; germination test date, net weight, and name and address of seller. The origin of seed must be listed on the seed tag for all species in the mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

   A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

ITEM 765.453 (Continued)

5) Verification of Seed Delivery. Prior to payment, Contractor shall submit the Seed Delivery Verification form contained within the contract or the Supplier's Verification on company letterhead or a bill of lading. Supplier verification must include all information requested on the Verification form within this contract. The bill of lading must include variety and species name, lot number, net weight shipped, date of sale, invoice, project or seeding location, and name and address of Supplier. All information must be filled in and complete for acceptance. Information must match the seed tags and quantity of seed used on the job. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

6) Seed Sample. If requested or if seed is from a previously opened bag, the Contractor may be asked to submit to the Engineer a sample of seed from the seed bag (1-2 cups) at the time of seeding.

SEEDING SEASON

The appropriate seeding seasons are:

Spring: April 1 - May 15
Fall: October 1 - December 1 for dormant seeding

PERMANENT SEED MIX(ES)

Calculating Pure Live Seed (PLS)

Quantities specified are PURE LIVE SEED. Greater quantities of ordered seed may be required to achieve actual specified seeding rates.

Pure Live Seed (PLS) is defined as a percentage calculated by multiplying the percent of pure seed by the percent of viable seed (total germination, hard seed, and dormant seed). For example:

If a seed label indicates 90% purity, 78% germination, 10% hard seed, and 2% dormancy, it is calculated to be 90% x [78 + 10 + 2]% = 81% PLS.

Therefore, each pound of PLS would need 1 pound / 0.81 = 1.2 pounds of seed with a 90% purity and 90% total germination

Seed Mix(es) shall be as specified below. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

ITEM 765.453 (Continued)

765.453 Woodland Edge Shade Mix

	Botanical Name	Common Name	% PLS by Weight
Grass			
	Elymus virginicus	Virginia Wild Rye	35.00%
	Elymus riparius	Riverbank Wild Rye	25.00%
	Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	9.00%
	Schizachyrium scoparium 'Albany Pine'	Little Bluestem 'Albany Pine'	5.30%
	Elymus hystrix	Bottlebrush Grass	3.00%
	Agrostis perennans	Upland Bentgrass	2.50%
	Carex vulpinoidea	Fox Sedge	2.00%
	Cinna arundinacea	Sweet Woodreed	2.00%
	Carex scoparia	Broom sedge	0.20%
	Juncus tenuis	Path Rush	0.20%
	Juncus effusus	Soft Rush	0.10%
			84.30%
Herb/Forb			
	Chamaecrista fasciculata	Partridge Pea	4.00%
	Desmodium canadense	Showy Tick Trefoil	2.00%
	Penstemon digitalis	Beard-tongue	2.00%
	Geum canadense	White Avens	2.00%
	Heliopsis helianthoides	Ox-Eye Sunflower	2.00%
	Zizia aurea	Golden Alexanders	0.80%
	Aster macrophyllus	Bigleaf Aster - PA Ecotype	0.50%
	Anemone virginiana	Thimbleweed	0.50%
	Monarda fistulosa	Wild Bergamot	0.40%
	Aster divaricatus	White Wood Aster	0.30%
	Aster prenanthoides	Zig Zag Aster	0.30%
	Solidago caesia	Woodland Goldenrod	0.20%
	Solidago odora	Licorice Scented Goldenrod	0.20%
	Oenothera fruticosa var. fruticosa	Sundrops	0.20%
	Solidago bicolor	White Goldenrod	0.20%
	Eupatorium fistulosum	Joe Pye Weed	0.10%
			15.70%
			100.00%

ITEM 765.453 (Continued)

Application Rate

Woodland Edge Shade Mix: 15 lbs/acre PLS. No cover crop shall be applied.

Any species substitutions shall be with a species having similar characteristics and function. Substitutions must be approved by MassDOT Landscape Design Section per the documentation submittal process.

50% Increase Adjustment for Field Conditions

Seeding under the following conditions requires a 50% increase in the permanent mix at the time of construction:

- Seeding out of season
  OR
- Seeding after Compost Blanket has been applied (unless already increased for out of season).

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 765.453, Woodland Edge Shade Mix, will be measured for payment by the pound of Pure Live Seed delivered and complete in place.

Item 765.453 Woodland Edge Shade Mix will be paid at the contract unit price per pound of Pure Live Seed delivered upon approval of all Seed Submittal Documentation. Overseeding required to correct poor germination or establishment shall be incidental to the item.

Application and care of native seed mix will be paid for separately under Item 765.635 Native Seeding and Establishment.

ITEM 765.453 (Continued)

NATIVE SEED WORKSHEET

Project Description: _____ Project No: _____

Contractor: _____Contract No: _____

Seed Mix Number & Description: _____

Contractor: Complete Prior To Ordering

Pounds of Seed Required Per Contract:

_____lbs./acre for _____Acre(s) OR _____ SY

Additional 50% increase if required (out of season or seeding over compost blanket):

_____**lbs. Total Seed Required**

Calculated Quantity for **P**ure **L**ive **S**eed (PLS[1]):

_____ **Total Pounds PLS**

Engineer: Verification at Time of Application

Number pounds delivered to site[2]: _____ Date(s): _____

Actual Seed Bag Tag/s Received or photo documented by Engineer: _____

[1] PLS=% pure seed x % viable seed (total germination, hard seed, and dormant seed).
*[2]Quantity delivered should match pounds **Total Pounds PLS** and **Verification of Seed Delivery**. Pounds should be shown on each Seed Tag.*

ITEM 765.453 (Continued)

SUPPLIER VERIFICATION OF SEED DELIVERY FOR MASSDOT PROJECTS

Date_____

We hereby certify that (*Seed Supplier*):_____

Furnished to (*Contractor*): _____

For use on: (*Project Description*)

_____

Project #: _____ Contract #: _____

Pounds of Pure Live Seed: _____

Of Mix (*Description*): _____

Lot Number _____

The material was delivered on (*Date*)_____.

The labels and contents meet all State and Federal regulations. The mixture consists of the following species, including cultivars (as applicable) and ecotype region, and at the following percentages (may be attached separately):

ITEM 765.635 NATIVE SEEDING AND ESTABLISHMENT SQUARE YARD

Work shall conform to the relevant provisions of Subsections 765 and 767 of the Standard Specifications and the following:

The work under this item shall consist of seeding, mowing, and other care to establish a stand of grass in the areas shown on the plans or as required by the Engineer. For the purposes of these specifications, the term "grass" shall apply to all the forbs, grasses, sedges, and rushes included in the materials.

QUALIFICATIONS

Seeding shall be done by a company having a minimum of five years of experience with native seed establishment. Prior to beginning work, the seeding Contractor shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications shall include providing documentation (photos and contacts) to demonstrate knowledge and expertise with native seeding and establishment and proof of having completed successful native seeding projects.

SEEDING SEASON

Seeding seasons for native mixes is April 1 - May 15 and October 1 - December 1 for dormant seeding. Written approval must be obtained for seeding outside the seeding season and, if approved, the permanent seed rate shall be increased by 50%.

Seeding season for cover crops shall be grain oats January 1 – July 31 and grain rye August 1 – December 1.

MATERIAL AND SUBMITTALS

Seed Mixes and Submittals shall be per the item(s) for permanent and annual (cover crop) seed mixes.

Compost Blanket, if used, shall meet the material and submittal requirements for that item.

Hydromulch shall be wood fiber or straw applied per the Standard Specifications and at the rates specified below and per the manufacturer.

A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of hydromulch, tackifier, and seed, per 100 gallons of water and as applicable to products used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above.

Fertilizer

No fertilizers shall be applied.

ITEM 765.635 (Continued)

Water

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

SEEDING

Hand broadcast method shall be used for all areas smaller than half an acre and when specified on the plans for areas over half an acre.

Seeding shall occur within 72 hours of placement of loam and final grading or the Contractor shall propose a reasonable, alternative schedule that shall be approved by the Engineer.

Surface Preparation

No seeding or soil preparation shall be done if soils are muddy or dry and compacted. Bare soils shall be raked to remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Ruts and depressions shall be filled with additional loam or compost and the soil shall be re-graded to a relatively smooth finish corresponding to the required grades.

When seeding over existing or compacted soil or soil that has sat bare for more than 30 days, surface will be prepared by tilling or raking to a minimum depth of 2 inches prior to seeding and prior to Compost Blanket application (when applied).

Surface preparation shall be compensated for under for loam placement or topsoil rehandled and spread as appropriate to the project.

Jute or coir mesh, when specified in the contract, shall be placed after seeding and per the Standard Specifications and the manufacturer’s instruction.

Surface preparation shall be approved by the Engineer prior to seeding.

Seeding over Various Substrates

Loam: Seeding shall occur within 72 hours of loam placement to prevent loss of topsoil. Seed shall be manually broadcast for areas less than half an acre (each area, not cumulative area) and when specified on the plans. Broadcasting shall be immediately followed by hydromulching as specified below. When not specified on the plans, larger areas may be hydroseeded as specified below.

Compost Blanket: Compost Blanket shall be applied as specified under that item. Seed should be hand broadcast at the same time as compost application to ensure a thin cover of compost over seed.

ITEM 765.635 (Continued)

When seeding is done after application of Compost Blanket the rate shall be increased by 50%. If the Compost Blanket is applied after December 1, seed shall be broadcast or hydroseeding over the compost in the Spring and the rate increased by 50% specified under Seed Application.

Compost Mulch over Modified Rock: Compost Mulch and seed shall be applied as specified under that item. No hydromulch is required.

Cover Crop

Cover crop shall be used when seeding out of season, when specified with the permanent native seed mix under that item, and as required to prevent erosion until the permanent seed establishes.

A cover crop should not be used with a steep slope mix or other permanent mix which already contains either cereal rye or oats in the composition of the mix. A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Seed Application

All seed shall be mulched as specified herein.

Seed application shall be by broadcast seeding or by hydroseeding as described below.

Broadcast Seeding

Seed shall be broadcast spread using a cyclone or whirlwind seeder or hand broadcast. Small or light-seeded species such as bluestem may be mixed with approved filler to achieve an even distribution. Seed shall not be broadcast when wind velocities are greater than 15 mph.

Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction (horizontally and vertically). To ensure seed to soil contact with broadcasting of seed, seeding shall be followed by rolling or tracking with equipment approved by the Engineer.

Broadcast seed shall be mulched with weed-free straw mulch unless seeding is done as part of Compost Blanket in which case it shall be as specified above under seeding with Compost Blanket application. Hydromulching shall be as specified under Hydromulching.

Hydroseeding and Hydromulching

Hydroseed and mulching shall be per the manufacturer's directions and as follows.

Hydroseeding shall only be used for sites over half an acre in size or with permission of the Engineer.

ITEM 765.635 (Continued)

Tank and hoses shall be cleaned from all previous hydroseeding and hydromulching projects. Seed shall be mixed into the slurry immediately before application and slurry applied within 30 minutes after seeds have been placed in the tank. Once seed has been placed in the tank, tank shall be agitated only enough to mix the seeds and keep slurry from separating.

A 2-step process shall be used for seeding in conjunction with hydromulch. Seed shall be applied with 500 lbs/acre of hydromulch in the first pass. A second pass with 1,000 lbs/ acre of hydromulch shall be applied in a second pass. Each pass shall be applied in a different direction.

Once the seed has been added to the tank mixture a one-hour time limit is set for spreading the mixture on the soil. Once the one hour has passed the excess mixture must be discarded.

For broadcast seeding, hydromulch shall be applied immediately following seeding at a rate of 1,000 lbs/acre. Tank shall be cleaned from any previous hydroseeding.

CARE DURING GERMINATION AND ESTABLISHMENT

Contractor shall care for seeded areas as necessary for successful germination. Care will include watering and weed control as necessary to achieve establishment of the specified seeded species after one growing season as specified below.

The Contractor shall maintain the stand of grasses to ensure healthy growth of the seeded species. Work shall include mowing or weed-whacking for weed control, watering if necessary, and removal of invasive plants.

Watering shall be sufficient to achieve soil moisture to a depth of 2 inches or more and such moisture is uniform. Method of watering shall not erode or damage soil or grassed surfaces.

General Weed Control: Unless otherwise directed, mowing shall be as specified under Mowing for Weed Control for seed establishment. Weeds shall be mowed prior to weeds setting seed (by the end of July unless otherwise approved).

Control of Invasive and Aggressive Weeds: Invasive and aggressive weeds, including but not limited to mugwort, ragweed, knapweed, foxtail, crabgrass, and chicory must be cut or treated prior to going to seed. Herbicide treatment must be coordinated with MassDOT. Undesired species (such as chicory) introduced due to use of incorrect seed mix shall be removed at the Contractor's expense.

MOWING FOR WEED CONTROL

Mowing for weed control shall be completed after weeds have sprouted and show leaf and bud growth, but prior to setting seed, generally between July 7th and August 1st, unless directed otherwise by the MassDOT Landscape Architect and the Engineer.

ITEM 765.635 (Continued)

Mowing height shall be as needed for weed control, generally to a height of 8 inches and not below 4 inches, unless directed otherwise. Mowing shall be with a brush hog mower or string trimmer other approved equipment. Conventional lawn mowers which cannot achieve the appropriate cut shall not be used.

Contractor shall give 48-hour notice prior to mowing work. Mowing shall only occur in dry sunny weather. Litter pickup should occur prior to mowing in all areas. If required, cut grass shall be raked and removed. Litter pickup and raking and removal of grass shall be incidental to the work.

Mowing equipment shall be approved by the Engineer prior to work.

OVER-SEEDING

Areas of bare ground greater than 2-3 feet in diameter shall be over-seeded with the specified mix during the appropriate season for seeding. Where required for overseeding mowing shall be as close to the soil as possible. Soil that is compacted shall be raked or otherwise roughened prior to over-seeding.

Over-seeding rates and methods shall those specified above under Materials and Methods. Following over-seeding, soil shall be lightly tamped to ensure seed to soil contact and areas shall be mulched with straw mulch and watered with a fine mist to moisten soil to a depth of at least 2 inches.

Over-seeding, mulch, watering, and all work for over-seeding shall be incidental.

DETERMINING SATISFACTORY GRASS ESTABLISHMENT

A well-established stand of the specified seeded species as determined by the Engineer and the MassDOT Landscape Architect will be required for Final Acceptance. The expectation is that an acceptable number and variety of the desired permanent seeded species (not the cover crop) will be visible. Generally:

- A minimum of 75% coverage by the specified permanent seeded species after one growing season. Of that percentage, generally, depending on the mix species:
  - At least 3 types of the permanent seeded grass species shall be visible.
  - At least 3 species of wildflowers shall be visible.
- There will be no significant gaps or bare soil (generally 2-3 feet in diameter or greater).
- There will be no more than 25% coverage by weed species.
- All soil shall be stabilized and there shall be no channeling or erosion.
- There will be no invasive or aggressive species within the stand at the time of acceptance.
- There shall be no evidence of seed from non-native mixes (i.e., clover) due to failure to clean the hydroseeding tank or using incorrect mix.

Invasive and aggressive weeds (such as mugwort, ragweed, knapweed, and chicory) must be cut or treated prior to going to seed for Interim Acceptance. Herbicide treatment must be coordinated with MassDOT.

ITEM 765.635 (Continued)

A warm-season grass mix with perennials will not have uniform growth. A uniform stand of grass may indicate use of an incorrect mix.

ACCEPTANCE OF SEEDING AND ESTABLISHMENT WORK

Conditional Acceptance shall be based on proper application of seed as specified herein.

Interim Acceptance of Care. Seeding will be inspected by mid-July to assess germination and Establishment conditions as described above. When necessary for Interim Acceptance, areas shall be mowed prior to weed species producing seed and as specified above under Weed Control. ***Areas requiring weed control that are not mowed prior to weed seed dispersal will not be approved for Interim Acceptance.*** Seeding that shows good germination and is determined by the Engineer and Landscape Architect to not require weed control at time of inspection shall be accepted for Interim Acceptance payment.

Final Acceptance of Establishment shall be given upon satisfactory Establishment as described above.

If the seeded area fails to meet the requirements of Establishment by the end of the growing season, Contractor shall propose and implement remediations and site shall be inspected during the following growing season after July 1st. All remediation shall be at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Native Seeding and Establishment will be measured for payment by the square yard, complete in place.

Native Seeding and Establishment will be paid at the Contract unit price by the square yard upon Conditional, Interim, and Final Acceptances as described above. This price shall include all submittals, seeding, rolling to ensure seed-to-soil contact, weed control other than mowing, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Native seed and cover crop mixes shall be compensated under the respective items.

Site preparation, including raking, tilling, removal of debris and stones, and other work to the prepare site for seeding shall be compensated under loam placement or topsoil rehandled and spread as relevant to the project. If used, Compost Blanket shall be compensated under the respective item.

Mowing for weed control will be incidental to this item.

Schedule of payment shall be as follows:

30% upon Conditional Acceptance

20% upon Interim Acceptance of Care, except this amount will be reduced to zero and final payment will be reduced accordingly when areas requiring weed control are not mowed as specified in the Interim Acceptance criteria.

50% upon Final Acceptance of Establishment

ITEM 767.121 SEDIMENT CONTROL BARRIER FOOT

The work under this item shall conform to the relevant provisions of Subsections 670, 751, and 767 of the Standard Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment control barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes with biodegradable natural fabric (i.e., cotton, jute, burlap) are intended to be the primary sedimentation control barrier. Photo-biodegradable fabric shall not be used.

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- 9-inch compost filter tubes
- Straw bales which shall be trenched

No straw wattles may be used. Additional compost filter tubes (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

When required by permits, additional sediment barrier shall be stored on-site for emergency use and replacement for the duration of the contract.

Where shown on the plans or when required by permits, sedimentation fence shall be used in addition to compost filter tubes and straw bales and shall be compensated under that item.

Sediment control barriers shall be installed in the approximate location as shown on the plans and as required so that no excavated or disturbed soil can enter mitigation areas or adjacent wetlands or waterways. If necessary to accommodate field conditions and to maximize effectiveness, barrier locations may be shifted with approval from the Engineer. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

MATERIALS AND CONSTRUCTION

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer’s instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

ITEM 767.121 (Continued)

Compost Filter Tube

Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

Straw Bales

Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

ITEM 767.121 (Continued)

Sedimentation Fence

Materials and Installation shall be per Subsection 670.40 and 670.60 of the Standard Specifications and the following:

Sedimentation fence shall only be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

MAINTENANCE

Maintenance of the sediment control barrier shall be per Subsection 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The Contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

DISMANTLING & REMOVING

Barriers shall be dismantled and/or removed, as required, when construction work is complete and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and sedimentation fence, shall be removed and disposed off-site by the Contractor.

ITEM 767.121 (Continued)

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grass mix).
- Sedimentation fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 767.121 will be measured and paid for at the contract unit price per foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Additional barrier, such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damage by construction activities shall be repaired or replaced as directed by the Engineer at the Contractors expense.

ITEM 804.2	**2 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC (UL)**	**FOOT**
ITEM 804.3	**3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC - (UL)**	**FOOT**
ITEM 804.4	**4 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC - (UL)**	**FOOT**
ITEM 804.5	**5 INCH ELECTRICAL CONDUIT TYPE NM-PLASTIC (UL)**	**FOOT**

The work under these items shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The work under these items shall include the electrical, traffic signal and telecommunication conduit installations in all locations, including on the bridges and underground, un-encased installations. The work shall be subject to the utility entities' installation details and material requirements as applicable and as such, prior to ordering materials for bridge installations and underground installations, the Contractor shall coordinate with the utilities to establish that their requirements are met. Shop drawing submissions for these and ancillary materials under these items shall be subject to the utility entities' approval.

The work shall include the furnishing and installation of 2 inch, 3 inch, 4 inch, and 5 inch non-metallic conduit for traffic signal, utility and lighting systems in accordance with the plans and as required by the Engineer. The conduit material for these installations shall be Schedule 80 polyvinyl chloride (PVC) plastic conduit.

METHOD OF MEASUREMENT

Item 804.2, 2 Inch Electrical Conduit Type NM – Plastic-(UL), Item 804.3, 3 Inch Electrical Conduit Type NM – Plastic-(UL), Item 804.4, 4 Inch Electrical Conduit Type NM – Plastic-(UL), and Item 804.5, 5 Inch Electrical Conduit Type NM – Plastic-(UL), will be measured for payment by the foot of conduit installed, complete in place.

BASIS OF PAYMENT

Item 804.2, 2 Inch Electrical Conduit Type NM – Plastic-(UL), Item 804.3, 3 Inch Electrical Conduit Type NM – Plastic-(UL), Item 804.4, 4 Inch Electrical Conduit Type NM – Plastic-(UL), and Item 804.5, 5 Inch Electrical Conduit Type NM – Plastic-(UL), will be paid at the contract bid price per foot under the respective items, which price shall include all labor, materials, equipment, furnishing all conduits, couplings, expansion fittings, sweeps, elbows, bends, caps, galvanized steel sleeves, clamps, hangers, anchor bolts (to include drilling and grouting), jointing compounds, sealing compound, excavation or jacking required, sand, gravel and materials required to backfill, backfilling, bedding or hanging of conduit, warning tape, pull strings, mandrel testing, chipping or saw cutting of pavement, and all incidental costs required to complete the work.

ITEM 809.41 TEMPORARY 4 INCH ELECTRICAL CONDUIT FOOT
ITEM 809.42 TEMPORARY CONDUIT CASING PIPE FOOT

The work under these items shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The work under these items shall include furnishing, installing, shifting, and removing temporary electrical conduit and casing pipe, as applicable, for electrical and telecommunication installations to enable installation of the abutment micro-piles. These temporary installations must be shifted the number of times required to enable installation of the micro-piles.

The Contractor may propose to install the final conduit in the temporary shift locations that are required to install the micro-piles if the conduit can be moved as needed without compromising its integrity, subject to the approval of the affected utility.

The material type of temporary conduit shall be selected by the Contractor. The conduit may be comprised of material components that provide sufficient flexibility for the Contractor to complete the shifts in horizontal and vertical directions as conceptually shown and noted on the plans. All temporary conduit materials shall conform to the Standard Specifications and shall be subject to approval by the utility that will occupy the conduit.

Temporary conduit casing pipe is required for the length of temporary conduit that will be occupied by the electrical utility. One casing shall be installed that is sized to carry the temporary 3-4" conduit arrangement. The casing will be subject to Contractor vehicular, equipment, and material loads in the vicinity of the Contractor's access to the work zone. The temporary casing pipe material shall conform to the Standard Specifications and shall be subject to approval by the electrical utility.

Temporary electrical conduit and temporary conduit casing pipe will be surface and subsurface installed, transitioning in elevation and horizontal alignment from subsurface connections at manholes. Surface installations shall be secured sufficiently to the surface to prohibit lateral and vertical movement, except as required for shifting at the bridges to enable micro-pile installation, and shall be protected from damage.

Following completion of the final cable installations by the utilities in the proposed final conduit installations the temporary conduits and casing pipe shall be removed and disposed.

METHOD OF MEASUREMENT

Item 809.41, Temporary 4 Inch Electrical Conduit and Item 809.42 Temporary Conduit Casing Pipe, will be measured for payment by the foot.

BASIS OF PAYMENT

Item 809.41, Temporary 4 Inch Electrical Conduit and Item 809.42 Temporary Conduit Casing Pipe, will be paid at the contract bid price per foot under the respective items, which price shall be full compensation for all materials, labor, equipment, and incidental costs required to complete the work including all the location shifts and final removal.

ITEM 810.2 4-4 INCH AND 2-5 INCH DUCT BANK FOOT
ITEM 810.6 6-4 INCH DUCT BANK FOOT

The work under these items shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The electrical and telecommunication entities that will wire and occupy the duct banks shall be alerted when duct bank installation is scheduled to allow their inspectors to observe the excavations and installations. The electrical and telecommunication entities on site may provide guidance for the installations, subject to the Engineer's approval.

Two concrete encased duct bank configurations are proposed: one duct bank comprised of 4 – 4 inch and 2 – 5 inch conduits and one duct bank comprised of 6 – 4 inch conduits. Segments of both duct banks will be concrete encased (underground) and segments of both duct banks will be un-encased and bridge-supported. The work under these items includes only the segments that are concrete encased.

The duct bank under Item 810.2 shall be comprised of Schedule 40 PVC conduits configured in a two (2) high by three (3) across arrangement of 4" size and 5" size as shown on the plans fixed in place with plastic spacers all encased in concrete conforming to M4.02.0 (4000 psi, 3/4 inch, 610 pounds cement concrete).

The duct bank under Item 810.6 shall be comprised of Schedule 40 PVC conduits configured to a two (2) high x three (3) across arrangement fixed in place with plastic spacers all encased in concrete conforming to M4.02.0 (4000 psi, 3/4 inch, 610 pounds cement concrete).

Installation of the duct bank under Item 810.2 shall be coordinated with Eversource Electric to follow their desired positioning of the 5" and 4" conduits. Removal of the existing Eversource Electric 3 by 3 concrete duct bank between manholes shall be measured and paid under Item 127., Concrete Excavation.

Prior to placing concrete the Contractor shall verify that the profile of the segment of duct bank that is to be completed in concrete will not result in conflicts with other underground objects within the next fifty (50) feet of installation ahead.

Work under these items shall include installation of the conduits up to a distance of approximately five (5) feet from the outer walls of the manholes. The final five (5) feet of installation and the penetration of the conduits through the manholes shall be conducted by the utility. The Contractor shall install pull wires through all the conduits with materials and installation conforming to the electrical and telecommunication entities' requirements.

Concrete encasement shall end at the back of the bridge backwalls unless otherwise directed. Appurtenances to secure the conduits at these interfaces and seal the walls shall be included under the respective bridge items. The un-encased conduits shall continue over the two bridges on supports that are included under the respective bridge items.

ITEMS 810.2 and 810.6 (Continued)

METHOD OF MEASUREMENT

Item 810.2 and Item 810.6 will be measured for payment by the Foot of the respective duct bank installed, complete in place.

Measurements will be taken by the foot between end terminals along the center line of the conduit duct bank.

BASIS OF PAYMENT

Item 810.2 and Item 810.6 will be paid for at the respective Contract unit prices per Foot, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

ITEM 816.01	**TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1**	**LUMP SUM**
ITEM 816.02	**TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2**	**LUMP SUM**
ITEM 816.03	**TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 3**	**LUMP SUM**

The work under these items shall conform to the relevant provisions of Subsection 815 of the Standard Specifications, the 2009 Manual on Uniform Traffic Control Devices (MUTCD), and the MassDOT amendments to the MUTCD, and the following:

The work shall include the furnishing and installation of all or part of the following items: traffic signal controller and cabinet mounted on a moment slab or existing foundation; signal posts and foundations wherein some are mounted on moment slab; mast arm assemblies with anchor bolts and foundations; emergency vehicle preemption components, vehicle signal heads; backplates; video detection; loop detectors in roadway, pedestrian signal heads and APS push button assemblies; all cable and wiring; ground rods, equipment grounding and bonding; power service connections; ethernet and wireless/cellular communication service connections; GPS units for coordination and all other equipment, materials and incidental costs necessary to provide a complete, fully operational traffic control signal system as specific herein and as shown on the plans.

The locations included in this contract are the following:

- Location No. 1: Intersection of Armory Street and Albany Street
  - Reconstruction of Existing Traffic Signal.

- Location No. 2: Intersection of Armory Street and Taylor Street
  - Reconstruction to include pedestrian signal heads on all approaches of the intersection.
  - Upgrade vehicular detection from loop to video control on all approaches.

- Location No. 3: Intersection of Armory Street and Genesee Street/Warwick Street
  - Revise signal timings and reinstall loop detection only on northbound and southbound approaches.

A list of the major components of the traffic signal system are included on the plan sheets.

Traffic signal operation and signalized intersection approaches shall be in conformance with the MUTCD throughout construction except when the intersections are under police control. The Contractor shall submit any proposed interim traffic lane and traffic signal arrangements at intersections that deviate from the existing or proposed arrangements to the Resident Engineer for approval.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Existing Installations

Existing signal installations shall be maintained in operation throughout the construction period and until the new signal is ready for operation. The Contractor may use temporary supports for signal heads as necessary to allow construction activities.

Any temporary installations shall be in conformance with the MUTCD. If an existing signal is to be turned off temporarily to allow controller switch overs or rewiring, police detail(s) shall be used to control traffic at the intersection.

Removal of the existing concrete foundations and handholes that are part of the traffic signal system, placing and compacting backfill, and temporary surface restoration where the foundations are removed are included under this item. Also included is disposal of signal system equipment deemed unacceptable for stacking by the City of Springfield.

After construction is completed and the new signals are in operation, unused items of the old signal shall be completely removed and transported as required by the Engineer in accordance with Subsection 815.65. The Contractor shall be responsible for replacement in kind of any equipment that is damaged. Old cable and unusable materials shall be disposed of by the Contractor.

All New Materials – Paint Requirement

The Contractor shall deliver to the Engineer a certificate of compliance from the manufacturer for all materials purchased from the manufacturer/distributor. All materials shall be new, and certain components, such as the controller and cabinet, shall be purchased from the same manufacturer/distributor and assembled by a qualified electrician/technician to ensure compatibility of components. All signal equipment shall be painted in black in accordance with standard MassDOT requirements and/or City of Springfield based on the direction of the Engineer.

Shop Drawings

Within 30 days of the Notice to Proceed, the Contractor shall submit shop drawings for signal equipment, a list of equipment, and manufacturer's equipment specifications to the Engineer in accordance with the relevant provisions of Subsection 815.20.

The Contractor shall not begin work until approval of the shop drawings and manufacturer's data has been received in writing from the Engineer. Approval of these drawings will be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans, standard specifications, and these special provisions.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Service Connections

New electric service connections as indicated on plan sheet is required at Location No. 1. Service connections shown on the plans are approximate only. The Contractor shall determine exact locations from the servicing utility, arrange to complete the service connections, and be responsible for all charges incidental thereto including installation of transformers, if required. Underground power conductors shall be in a separate conduit from other services but located within the same trench is acceptable. The servicing utility will furnish connection and power at the locations shown on the Contract Drawings. The utility company will connect and disconnect power as required. The Contractor shall be responsible for discontinuing existing service connections, if applicable.

No work shall be done in manholes or on power poles without a representative of the servicing utility being present. The Contractor is responsible for coordinating the utility work. It shall also be the Contractor's responsibility to pay all charges to the utility company for performing this work. No direct reimbursement will be made under this contract to the Contractor for payments made to the utility company, it being understood that full compensation for any payment made by the Contractor to the utility company will be included in the contract prices bid. The 2-inch electrical conduit for underground service connections will be paid separately under Item 804.2.

The Contractor shall install a confirmation beacon at the traffic signal location as shown on the plans. The confirmation beacon shall serve to validate to the driver of the emergency vehicle that the traffic signal has recognized the preemption call and is in an active preemption phase. The confirmation strobe shall be optimally located and shall have a white lens. The confirmation beacon shall not be on the spare signal cable. A separate conductor cable is required to power the confirmation beacon.

The Contractor is responsible for the proper programming of the phase selector, orientation of the optical detectors, and all other work necessary to provide a complete and operating emergency vehicle preemption system. The Contractor may be required to field adjust the location of the optical detectors in the presence of the Engineer and/or local emergency department (Police/Fire) to properly detect preemption calls from approaching vehicles.

Flashing Operation

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Section 4D 28-31 of the latest MUTCD.

Signal Cable & Wiring

All signal cable connections in the bases of signal poles, posts, and cabinet shall be made by means of appropriate terminal blocks. These blocks shall be completely furnished and installed on terminal block mounting strips in bases. All cables & wires shall comply with Subsection 813.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Traffic Signal Equipment; Terminal & Facilities

The traffic signal cabinet monitor unit (CMU), Auxiliary Display Unit (ADU), Serial Interface units (SIUs), Universal Switch Pack/Flasher, cabinet power supply, High-Density Flash Transfer Relay Unit (HDFTR) and all other ancillary traffic signal control devices shall comply with Advanced Transportation Controller Cabinet (ATCC) 5301 v02 standard as indicated in the Section M10:Traffic Control Devices of the Standard Specifications.

Controller Unit and Cabinet

The traffic controller unit shall be supplied in a NEMA ATC configuration as required in the list of major traffic signal items included on the plans and should meet the requirements listed in the Section M10:Traffic Control Devices of the Standard Specifications.

Cabinets shall be made of aluminum and outside painted Aluminum or per requirements of the City of Springfield. The cabinets shall also be wired with a normally closed switch connected to a user defined input to the controller for remote monitoring of the control cabinets' door open status. Where applicable, the cabinets shall be installed with the door opening positioned in order to allow general observation of the flow of traffic and the inside of the cabinets at the same time. Controller cabinet foundations shall not obstruct a sidewalk or crosswalk so that passage by physically-challenged persons is impaired. The foundation, if installed in a grassed area, shall include a cement concrete workman’s pad and walkway made the same width as the cabinet foundation, extending to a length of 30”-36” away from the foundation, and is a thickness of 4” placed on an 8” compacted gravel base.

The Contractor shall include a 25’ RS-232 cable in each cabinet to support communications between the controller unit and a laptop computer.

The Contractor shall establish the controller cabinet bolt down requirements and bolt locations for the cabinet obtained for the project prior to forming the cabinet foundation at the moment slab for Location No. 1. Additionally, conduit runs shall be established and segments should be identified that require transitions from rigid metallic conduit to non-metallic (plastic coated) within the project limits.

Testing of Ground System

The Contractor shall perform testing of the equipment grounding system in the presence of the Resident Engineer in accordance with the Standard Specifications.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Vehicle Detection System

The Contractor shall furnish and install a vehicle detection system that detects vehicles on a roadway by processing images sent from a sensor/camera to an interface board with detector outputs that can be received by the traffic signal controller. These traffic sensors/cameras shall be installed at locations shown on the plans and in accordance with these specifications. The detection system shall be non-intrusive (i.e. above ground) and shall consist of:

a) Mounting brackets
b) Traffic sensor and detection module
c) Communications cable

The detection system also, at a minimum, shall be able to:

- Collect and store volume, speed, and classification of vehicles and bicycles;
- Stop bar detection; and;
- NEMA ATC compatibility

The Contractor shall use one of the vehicle detection systems that shall meet the approval of City of Springfield. The detection system shall be connected, via Ethernet, to the server to allow for remote monitoring and control. Components of the detection system shall all be the same as to make and model.

Mounting Bracket - The mounting brackets associated with the detection system shall be per the manufacturer's recommendations.

Vehicle Detection Zones - The Contractor shall be responsible setting the vehicle detection zones as shown on the plans. The Contractor may be required to adjust and readjust the location of existing and proposed vehicle detection zones in the presence of the Engineer, at no additional cost, to properly set the detection areas.

Installation and Training – The manufacturer of the vehicle detection system, or their representative, shall design sensor layout, placement and lens size, and supervise the installation and testing of the equipment. A factory certified representative from the supplier shall be on-site for a minimum of one day.

The manufacturer shall provide 3 complete sets of maintenance manuals for the installed equipment. These manuals shall have complete set-up, maintenance and troubleshooting procedures presented in an organized format.

Warranty, Maintenance and Support – The traffic sensor shall be warranted by its supplier for a minimum of ten (10) years.

ITEMS 816.01, 816.02, and 816.03 (Continued)

The vehicle detection system shall be warranted by its supplier for a minimum of two (2) years. During the warranty period, the supplier shall provide technical support by telephone during normal business hours and request for support by telephone shall be answered by factory certified personnel within one (1) hour. During the warranty period, certified personnel from the supplier shall be on site within seventy-two (72) hours if required.

GPS Unit

The Contractor shall install a new GPS unit at Location No. 1 (Armory Street at Albany Street) that is compatible with the GPS units at Locations No 2 and No 3 for co-ordination purposes.

Wire Loops Installed in Roadway

The Contractor shall install wire loop detection in the roadway as indicated on the plans and these technical special provisions at Location no. 3 (Armory Street at Genessee Street/Warwick Street). The work shall include the furnishing and installation of the wire loop detector on all approaches of traffic signals to replace existing loops that will be disturbed by the road work. The work shall also include lead-in cable, connection to amplifier, adjustment to amplifier, testing, and all other equipment, materials and incidental costs necessary to complete and place the detector in operation.

Vehicle and Bicycle Loop Detectors: Wire loop detectors shall be installed in the roadway for vehicle and bicycle detection. In advance of the loop detector installation, the Contractor shall mark, on site, the loop detectors with any changes required by field conditions. The loop detector layout shall be inspected and approved by the Engineer before the loop detectors are installed. The detector lead-in cables shall be labeled with the street name, phase, detector number and terminal numbers, in the pull box containing the detector lead-in splice. This labeling and attachment shall be of durable materials such as brass or plastic, attached by wire or plastic ties.

Adhesive attachment of the label shall not be acceptable. Loop wire shall be encased in a protected plastic tubing of PVC or polyethylene plastic, IMSA 51-5,6.25 millimeters outside diameter, and the wire may have cross-linked polyethylene insulation, or it may have THHN/THWN insulation or as per the instructions by the Resident Engineer. Splicing insulator shall be an approved re-enterable rigid body splice kit with a non-hardening sealing compound compatible with the wire insulation.

Splice and Connection: Splicing and connection shall be made in the pull box nearest the roadway loop sensor but not exceeding four loops per pull box. All loops included in a detector group as shown on the plans shall be spliced in a single pull box.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Each lead and lead-in connector shall be stripped back and spliced using a pressure type wire connector applied with a crimping tool. Multiple loop sensors shall be identified as detailed on the plans. Lead-in splicing shall be staggered to prevent contact with each other. Each crimped splice shall be soldered and insulated. The insulation material shall be as listed in the MassDOT approved materials. The shielded lead-in cable outer jacket and shield shall be stripped back sufficiently to ensure that the shield cannot come into contact with the spliced conductors. Follow the instructions of the kit manufacturer for this procedure when installing the re-enterable splice kit. The above splice shall be done on the day of the loop wire installation to prevent the entrance of any moisture into the plastic tubing. The lead-in conductors shall be connected to the appropriate terminals in the controller cabinet, by using crimped or soldered terminal ends. The heat source for soldering shall be electrical not exceeding 30W capacity.

Testing of Loops: The testing of the loops shall be performed in the presence of the MassDOT's Engineer, before and after the loop sensor is sealed in the pavement as detailed below. After installation of wire loop sensors in the roadway and installation of shielded lead-in connecting the loop sensors to the controller cabinet, each loop sensor and lead-in combination shall be tested (at the controller cabinet) for proper installation. After the tests have been satisfactorily completed, all loop sensor/shielded lead-in inductance shall be measured, and a written report of the results shall be filed with the Engineer and a copy stored with the "box prints" at the intersection.

Flasher and Flash Transfer Relays

Flasher and Flash Transfer Relays shall comply with shall comply with Advanced Transportation Controller Cabinet (ATCC) 5301 v02 standard as indicated in the Section M10:Traffic Control Devices of the Standard Specifications. Note: The controller cabinet assembly shall be initially supplied with a full complement of flash transfer relays to accommodate each available position of the backpanel.

Spare Cabinet Components

The Contractor shall furnish spare components in the cabinet, as normally required by MassDOT/City of Springfield, at the time of the final inspection.

Emergency Preemption

The emergency vehicle preemption control system shall consist of a data encoded phase selector(s) to be installed within the traffic control cabinet. This unit will serve to validate, identify, classify, and record the signal from the optical detectors located on support structures at the intersection. Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans. The Contractor shall ensure that the system is compatible with emitters located on the town emergency vehicles.

ITEMS 816.01, 816.02, and 816.03 (Continued)

The optical detectors shall be single input, single output units used to control one approach. All traffic signal installations shall be supplied with a minimum of two 1-way optical detectors unless otherwise noted in the major items list. The optical receivers shall be installed with single band of color-coded electrical tape wrapped around vertical body of the receiver. The corresponding preemption cable terminated in the cabinet shall also be wrapped with a single band of electrical tape of the same color as the receiver it is connected to. Each color used within the same cabinet shall be unique.

The phase selector shall be a rack-mounted plug-in four channel, dual priority device. The phase selector shall plug into a shelf-mounted single card slot chassis. Programming the phase selector shall be via a PC-based computer utilizing unit specific software. A hard copy of final programming data shall be left in the control cabinet. The Contractor shall supply a complete set of interface cables for phase selector to laptop connection.

Ethernet Service Connection

The work shall include the furnishing and installation of the following items: cable service, all cable and wiring; and all other equipment, materials, and incidental costs necessary to provide a complete, fully operational, and closed loop system traffic control signal system.

Cellular Modem

The Cellular Modem shall be installed in the cabinet as shown on the plans and or as directed by the Engineer to gain remote access via cellular data link. The Contractor shall supply all necessary documentation, wiring and antenna to make for a fully functioning Cellular connection. The Contractor shall work with the agencies IT department to develop an IP address scheme to be used.

The Cellular modem shall have 5 or more 10/100 auto-sensing Ethernet ports. The Cellular modem shall have one or more RS232 Serial DB9 port capable of supporting baud rates up to 115200 bps. The Cellular modem shall have one or more USB 2.0 ports. The Cellular modem shall have a power input of 8-30 VDC (12VDC nominal).

The supplier shall provide a limited one-year warranty on the Cellular Modem. See suppliers standard warranty included in the Terms and Conditions of Sale documentation. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.

Traffic Signal Posts and Bases

Traffic signal posts and bases shall be as indicated on plan sheets. Traffic signal post heights are specified on the plans. Bases shall be provided with a door opening complete with a cap screw fastening device and a tapped hole for a brass grounding lug.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Mast Arm Poles and Foundations

Mast arm poles, bases and foundations shall be fabricated and constructed in compliance with MassDOT's Standard Drawings, the Contract drawings, the 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals 6th Edition, and MassDOT's December 2015 Overhead Signal Structure & Foundation Standard Drawings using a design wind speed of 130 MPH.

All mast arm poles shall be Type 2 galvanized steel monolevers. Acceptance of Type 2 mast arm poles will be contingent upon review and approval of shop drawings submitted by the Contractor. The Contractor is not required to submit load calculations for mast arm designs that conform to the 2015 MassDOT Standard Drawings. Shop drawings should be limited to identifying the dimensions of each mast arm and foundation.

Soil boring logs with soil type recommendations are furnished in the bridge plans. These soil type recommendations were used to select the standard foundation designs specified in the Contract drawings. In the event that the Contractor encounters soil conditions or ledge which prevent the use of the specified MassDOT standard foundation type, the Contractor is responsible for notifying the Design Engineer, who will select and design an alternative foundation type that conforms with AASHTO Standards. Alternative foundation types could include spread footings, coring and socketing into rock or other foundations previously used to support similar loads, within reason.

The Contractor shall provide a set of calculations, stamped by a Structural Engineer registered in the Commonwealth of Massachusetts, along with plans and specifications for the foundations for review and acceptance by the Design Engineer. The Contractor shall request written approval from the Engineer before the placement of any concrete for foundations of mast arms, signal posts, and cabinets. The Contractor will be responsible for supplying the Design Engineer with final as built dimensions/elevations to be updated on the plans. Anchor bolts shall be set accurately, and tops shall be formed neatly. The top forming shall extend downward for a minimum of 12 inch on the side of any foundation. The lower portions of all foundations may be poured directly against undisturbed earth or may be formed at the option of the Engineer. Foundations shall not obstruct a sidewalk or crosswalk so as to impair passage by physically challenged persons and shall be flush; ADA/AAB clearance shall be maintained.

Pull Boxes

Pull box units shall be grounded and installed as indicated on the plan sheets within the moment slab and sidewalk. Pull box units shall be precast concrete and conform to MDPW(MassDOT) SD2-031. The 1.5-inch sleeve through the curb joint shall be included as a part of this item. All or any excavation related to this item shall also be included. Note that pull boxes will be paid under separate items and not under 816.01

ITEMS 816.01, 816.02, and 816.03 (Continued)

Vehicular Signal Heads

The housings shall be 12-inch LED Type and shall be listed on the MassDOT "Approved Equipment" list. 5-inch louvered black backplates with 2" retroreflective yellow border shall be provided on all signal heads or as noted on the plans. All indications shall be equipped with a standard cut-away visor. Only backplates that are listed in the latest MassDOT "Approved Equipment List" will be used on this project.

Signals shall be rigidly mounted. All signal heads mounted overhead on mast arms shall be installed, with the bottom of the signals at the same height. The Contractor shall modify any signal head location that is visibly obstructed to a motorist or pedestrian by overhead street light posts or other obstructions as determined by the Engineer.

Software

All local controller, malfunction management unit, preemption unit and detector amplifier software shall be supplied with the latest version. Any software upgrades released by the manufacturer shall be supplied to the owner for a period of five years after acceptance of the traffic signal installations.

Database Programming

Each programmable local hardware component (controller, malfunction management unit, preemption unit, and detector amplifier) shall be initially programmed by the Contractor based on information contained on the plans.

Warranty – LED Signals

The LED signal module will be replaced or repaired by the manufacturer if it exhibits a failure due to workmanship or material defects within the first 60 months of field operation.

The LED signal module will be replaced or repaired by the manufacturer if it exhibits either a greater than 40 percent light output degradation or a fall below the minimum intensity levels within the first 36 months of field operation.

Pedestrian Signal Heads with Countdown Display

The housings shall be 16" LED Type with countdown display. All pedestrian signal indications shall have full overlay international symbol (Hand/Person) graphics (not outlined) as shown on the plans. All indications used at an intersection shall be a similar style. The pedestrian signal head shall be a 16"x18" single bimodal section with Count Down Timer. The placement of pedestrian signals shall conform to the Section 4E of the 2009 MUTCD.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Accessible Pedestrian Signals (APS) – Pedestrian Push Buttons

APS pedestrian push button controls shall be raised from or flush with their housings and shall be a minimum of 2 inches in the smallest dimension. The force required to activate the controls shall be no greater than 5lbs.

APS push buttons shall include an audible locator tone, vibro-tactile arrow integrated sign and saddle with LED confirmation light.

APS pedestrian push buttons shall be located as close as practicable to the level landing of the sidewalk curb ramp serving the controlled crossing and shall permit operation from a clear ground space. If two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian push buttons and/or legends on the pedestrian push button signs should clearly indicate which crosswalk signal is actuated by each pedestrian push button. The placement of pedestrian signal push buttons or detectors shall conform to the Section 4E-08 of the 2009 MUTCD and/or as shown on the plan sheets. The 9”x 15” standard sign (R10-3e) shall be integral to the pushbutton assembly or mounted immediately above the button.

A maximum mounting height of 42 inch above the finish sidewalk grade shall be used for pedestrian push buttons. Buttons shall be located within 10-24 inches of the back of sidewalk, depending on the mounting height and available level sidewalk area, to conform to the ADA side reach requirements for Accessibility.

Traffic Signal LED Module

All signal and pedestrian displays shall be equipped with LED signal modules. All red, amber, green, and pedestrian signal housings with the exception of optically programmed and fiber optic housings and shall conform to the following where applicable:

- ITE’s Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated July 1, 2007
- ITE’s Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement, Dated June 27, 2005.
- ITE’s Pedestrian and Countdown Signal Modules Compliant to PTCSI – Part 2 Light Emitting Diode (LED), Dated, February 2011
- On the MassDOT Traffic Signal Approved Equipment List

For an LED module to installed on this project, the LED module shall have approval from the MassDOT Traffic Control Products Approved Equipment Committee and be included on the Traffic Control Products List prior to the date of this proposal.

To prevent the LED module warranty from being voided, the connecting leads on the module shall not be cut. The original LED module leads shall be connected to the signal head terminal block as continuous wire without splices.

ITEMS 816.01, 816.02, and 816.03 (Continued)

The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

- A failure due to workmanship or material defects within the first 60 months of field operation.
- A greater than 40 percent light output degradation or a fall below the minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation.

Speech Walk Message

The speech walk message shall be audible from the beginning of the associated crosswalk. The speech walk message and associated APS pushbuttons shall be as follows:

PEDESTRIAN PUSHBUTTON	SPEECH WALK MESSAGE
Item 816.01	
P1, P2, P3, P4	Walk sign is on to cross Armory Street
P5, P6	Walk sign is on to cross Albany Street
Item 816.02	
P1, P2, P5, P6	Walk sign is on to cross Armory Street
P3, P4	Walk sign is on to cross Taylor Street
P7, P8	Walk sign is on to cross Agnew Street

Tactile Arrows and Locator Tones - Shall meet the following minimum requirements:

- APS pushbuttons shall incorporate a locator tone at the pushbutton the locator tone, measured at 3 feet from the APS pushbutton, shall be 2dB minimum and 5dB maximum above ambient noise level in standard operation and shall be responsive to ambient noise level changes. Tones shall consist of multiple frequencies with a dominant component of 880Hz. The duration of the locator tone shall be 0.15s and shall repeat at intervals of 0.15s.
- APS pushbuttons shall be a minimum of 2 inches across in diameter and shall contract visually with their housing and mounting.
- APS pushbuttons shall include a vibro-tactile arrow aligned parallel to the crosswalk direction. The arrow shall be raised 0.03 inches minimum and shall be 1.5 inches minimum in length. The arrow head shall be open at 45 degrees to the shaft and shall be 33 percent of the length of the shaft. Stroke width shall be 10 percent minimum and 15 percent maximum of arrow length. The arrow shall contrast with the background.
- The arrow shall vibrate during the "WALK" portion of the cycle.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Testing of Traffic Signal System

The signal system shall operate continuously without failure for 30 days before requesting a final inspection. The Contractor shall notify the Resident Engineer when the signal is first put into service.

The Contractor shall perform testing of the equipment grounding, terminals & facilities, detectors, preemption, interconnect, and other systems in the presence of the MassDOT Department and Engineer in accordance with the Standard Specifications. The Contractor shall order and pay for a Police Office detail to facilitate the equipment testing.

As-Built Drawings

The Contractor shall supply the Engineer with marked-up plans or hand sketches to indicate equipment that has been installed in a location that differs from the contract drawings. Conduit shall be drawn with ties to enable future dig-safe requests.

CONSTRUCTION METHODS

Once the Contractor begins construction in the area, it shall then be his responsibility to operate and maintain the traffic/pedestrian signal system. Traffic signal operation and signalized intersection approaches shall be in conformance with the MUTCD throughout construction except when the intersections are under police control. The Contractor shall submit any proposed interim traffic lane and traffic signal arrangements at intersections that deviate from the existing or proposed arrangements to the Resident Engineer for approval.

The Contractor shall be required to keep records of dates when traffic signal posts are installed and when traffic signals are put on flashing and stop and go. These records are to be submitted to the Engineer by the first of each month. If required, the Contractor shall make all electrical arrangements with utility for providing power and other service to the controllers.

The Contractor shall supply and install the conduit and wires to the utility company under their supervision. The Contractor will be required to pay directly to the company, all charges resulting from, at no additional cost to MassDOT above the lump sum bid for this contract. The Contractor, or his agent, will not cause any of his personnel to work in an electric manhole or on a pole without permission of the responsible utility company.

The Contractor shall note in advance signal post foundations that will be standard versus special pre-cast as indicated on the plan sheets and shall work closely with the pouring of moment slab and bridge deck work within the project area. In general, any signal posts located on the moment slabs or bridge have cast in place bases that are anchored to the moment slabs or bridges as detailed on the bridge plans and do not require standard precast foundations.

ITEMS 816.01, 816.02, and 816.03 (Continued)

Removal and Transporting of the Existing Traffic Signal Equipment

Existing traffic signal equipment in good condition shall be delivered to and stacked at the MassDOT facility/City of Springfield as instructed by the MassDOT Project Manager.

BASIS OF PAYMENT

Items 816.01, 816.02 and 816.03 will be paid for at their respective Contract lump sum price, which price shall include all labor, material, equipment, and incidental costs required to complete work and provide a fully operating interconnected traffic control signal system.

No separate payment will be made for maintenance of existing installations, the removal, stacking and transporting of existing traffic signal equipment, service connection, but all costs in connection therewith shall be included in the respective Contract lump sum price bid.

Conduit will be paid separately under Item 804.2, 2-inch Electrical Conduit Type NM-Plastic (UL), Item 804.3, 3-inch Electrical Conduit Type NM-Plastic (UL).

Pull boxes will be paid separately under Item 811.31.

ITEM 816.1 FIELD ADJUSTMENT OF EXISTING TRAFFIC SIGNAL TIMING HOUR

The work under this Item shall conform to the relevant provisions of Subsection 815 of the Standard Specifications and making timing adjustments as indicated on the plan sheets at the following intersections before and after construction:

2. Armory Street at Taylor Street
3. Armory Street at Genessee Street/Warwick Street
4. Liberty Street at I-291 EB Off-Ramp
5. Liberty Street at Chestnut Street
6. Lyman Street at Chestnut Street
7. Taylor Street at Chestnut Street
8. Dwight Street at Lyman Street
9. Liberty Street at Dwight Street

The Contractor shall provide a MassDOT prequalified traffic signal Subcontractor to implement temporary traffic signal timing changes directed by the Traffic Engineer and/or MassDOT. These temporary timing changes may occur throughout the life of the Project.

The work under this item shall include modifying existing traffic signal control cabinets at locations listed above and/or designated by the Engineer.

The work under this item requires the Contractor to make wiring changes or adjustments to the operation of an existing control cabinet. These modifications may include, but are not limited to, wiring and programming a controller for preemption, coordination, or timing events; adding a phase; adding detection to a movement, modifying controller and cabinet connections, wiring, and programming for closed loop system control, etc.

When modification work involves accessing connectors of the controller, a mating connector, harness, and terminal block shall be installed into the cabinet where necessary. All connector pins shall be accessible through the harness terminal block using simple tools without the need to solder connections.

All modifications shall be done in a neat, workmanlike manner. Wiring shall be secured to existing wire routing. All surface mounted components secured to back or side panels shall be properly labeled.

The Contractor is responsible to modify the cabinet wiring diagrams to reflect the changes made in association with the control cabinet modification. All programmable data contained within the menu-driven controller, conflict monitor, amplifiers, and other devices shall be printed out, documented, and kept within the cabinet.

ITEM 816.1 (Continued)

All modifications affecting signal circuits shall require that the conflict monitoring operation be tested upon completion of work. This shall include all conflicting signal fault detection along with voltage monitor and 24 Volt DC power failures.

A traffic signal technician shall work on controller software and hardware, and communications equipment related to the closed loop systems and communication systems. Traffic signal technicians must be factory certified to work on hardware and software.

The technicians shall be knowledgeable as to all the controller's inner and outer configurations including all connecting accessories. The technicians shall be adept with programming the controller through a laptop or office computer and implementing/troubleshooting Ethernet communications.

The work shall include all labor required to perform field adjustments of existing traffic signal timing, as required by the Engineer, at signalized intersections that are anticipated to be impacted by the Contractor’s Temporary Traffic Control Plan at the project site as indicated above.

METHOD OF MEASUREMENT

Item 816.1 will be measured for payment by the Hour, per person performing the work as described above.

BASIS OF PAYMENT

Item 816.1 will be paid for at the Contract bid price per Hour, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

ITEM 816.2 TRAFFIC MONITORING AND ENGINEERING HOUR

The work under this Item shall conform to the relevant provisions of Subsection 815 of the Standard Specifications and the following:

The Contractor shall provide a MassDOT prequalified Traffic Engineer to conduct field monitoring of traffic signal operations and to provide recommendations for signal timing modifications at the identified traffic signal locations throughout the length of this Contract.

Note: The Contractor shall staff and provide resources to address signal operational issues identified and communicated by MassDOT, as soon as possible, throughout the duration of the Project.

The Contractor shall conduct field reviews of traffic conditions at signalized intersections affected by any new Temporary Traffic Control Plan setup at the project site including coordination with Pioneer Valley Transit Authority (PVTA) for service diversions as directed by the Engineer. Field adjustments shall be recommended based on observed conditions.

The Contractor shall keep records of dates when temporary timing changes are implemented. These records shall be submitted by the Contractor to the Engineer. A written copy shall be transmitted to the Engineer by the first of each month.

Identification of intersections to be monitored shall be coordinated with MassDOT and the City of Springfield. Generally, these are anticipated to include intersections along major roadway corridors within ½ mile of the project site and along PVTA service diversion bus routes.

METHOD OF MEASUREMENT

Item 816.2 will be measured for payment by the Hour, per person performing the work as described above.

BASIS OF PAYMENT

Item 816.2 will be paid for at the Contract bid price per Hour, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

ITEM 816.82	**TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.2**	**LUMP SUM**
ITEM 816.83	**TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.3**	**LUMP SUM**
ITEM 816.84	**TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.4**	**LUMP SUM**
ITEM 816.85	**TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.5**	**LUMP SUM**

The work under this item shall consist of maintaining the existing traffic signals during construction for the entire duration of the project and until the signal system is ready for operation at following intersections:

- Location No. 2: Armory Street at Taylor Street (Reconstruction of Existing Traffic Signal to include video detection and upgrade pedestrian signal head indications/posts on all approaches)
    - Close northbound direction to all traffic during entire duration of construction, open only for emergency vehicles.
    - Install preemption system equipment, Field Monitoring Unit (FMU) with antenna, antenna cable, interface cables and IP camera that will be used for emergency vehicle pre-emption throughout the construction period.
    - Remove and temporarily stack four signal heads and install four temporary signal heads.
    - Remove the temporary signal heads and reinstall the original signal heads when Armory Street two-way traffic is restored.

- Location No. 3: Armory Street at Warwick Street/Genessee Street (Reinstall loop detection along northbound approach after construction is completed)
    - Close northbound direction to all traffic during entire duration of construction, open only for emergency vehicles.
    - Install preemption system equipment, Field Monitoring Unit (FMU) with antenna, antenna cable, interface cables and IP camera that will be used for emergency vehicle pre-emption throughout the construction period.
    - All timing changes will be covered under Item 816.1.

- Location No. 4: Liberty Street at I-291 Eastbound Off-Ramp
    - Install temporary traffic signal equipment and traffic controls for the northbound channelized right turn lane at the intersection as indicated on the plan sheets.
    - Remove the temporary traffic signal equipment and traffic controls, restoring all disturbed surfaces, when two-way traffic on Armory Street is restored.
    - All timing changes will be covered under Item 816.1.

ITEMS 816.82 through 816.85 (Continued)

- Location No. 5: Liberty Street at Chestnut Street
    - Modify westbound rightmost lane to right turn only lane as indicated on the plan sheets and make timing changes as listed. All temporary pavement markings and signing changes will be completed under Item 832, Item 847.1 and Item 864.04. All timing changes will be covered under Item 816.1.
    - Remove and temporarily stack one signal head and install one temporary signal head.
    - Remove the temporary signal head and reinstall the original signal head when Armory Street two-way traffic is restored.

The work shall be performed in accordance with the applicable provisions of 2009 Manual on Uniform Traffic Control Devices (MUTCD) and the MassDOT amendments to the MUTCD.

The Contractor shall install temporary supports for signal heads as necessary to allow for construction activities. Modification of the existing detection system, signal timing and phasing may be required for the various construction stages as needed under the direction by an Engineer to maintain safe and efficient traffic operations during all phases of the project. If an existing signal is to be turned off temporarily to allow controller switchover or requiring temporary turn-off, a police detail shall be used to control traffic at the intersection until stop-and-go operation is restored.

IP Camera Fixed

The IP camera fixed shall be supplied with all equipment to provide for a full installation including but not limited to mounting bracket, Ethernet cables, surge equipment and meet or exceed the following:

A. The IP camera: Should have an image sensor and camera lens with a horizontal field of view of 100 degrees to 38 degrees, vertical field of view, remote zoom and focus (if needed). The camera shall support an automatically removeable IR cut filter and support multiple video streams. The camera shall support POE for power. The camera shall be powered via cabinet mounted POE Fiber Ethernet switch. The camera shall be mounted for clear sight of view with no obstruction of trees, foliage etc. The camera shall support an operating temperature of -40 degrees F to +122 degrees F.
B. The IP Camera fixed shall include all mounting hardware, cables and connections to perform a complete install.
C. The IP Camera fixed shall be integrated into the FMU web software to provide streaming video displays.
D. The Contractor shall supply if needed any camera manufacturer licenses to provide for a complete system.
E. The IP Camera fixed shall be supplied with a POE injector.
F. Each IP Camera fixed shall be supplied with a 2-year warranty or entire duration of project.

ITEMS 816.82 through 816.85 (Continued)

Field Monitoring Unit (FMU)/Fire Dispatch Control Unit

The FMU shall meet or exceed the following:

A. Traffic Signal Preempt, Remote Monitoring System Client User Interface Requirements: The FMU software user interface shall provide but not limited to the following features to meet the requirements:
    a. The user interface shall be web based, and viewable using a web browser. Internet Explorer, Chrome and Firefox browsers shall be supported, as well as Safari on an iPad. Systems that use remote desktop or similar to view a thick-client user interface will not be acceptable.
    b. Should have a map display and allow for diagnostics and log displays of events occurring along with alarms and alerts, produce diagnostic reports when needed.

The Fire Dispatch Control Unit shall be installed in the City of Springfield, MA fire station as instructed by the Fire Chief, City of Springfield, MA.

Preemptive System

The preempt system shall support both radio and cellular communications. The radio system shall operate on unlicensed bands and shall not require user certification. The radio shall have a range in excess of 2500 feet. The system latency shall support real time communications on a second-by-second basis from the vehicle to the intersection. Data paths shall be established (if configured) to operate via radio and via cell network. The system shall continue to operate correctly in the event of radio or cellular failure.

Once construction is completed and the new temporary signal system is in operation, all the old signal equipment that is not required shall be completely removed and stacked as required by the Engineer in accordance with Subsection 815.65. Old cable and unusable materials shall be disposed of by the Contractor.

Additionally, the signals will be restored back to the pre-construction conditions at the end of the construction period, unless otherwise noted on the plan sheets or approved by the Engineer.

BASIS OF PAYMENT

Items 816.82, 816.83, 816.84 and 816.85 will be paid for at their respective Contract lump sum price, which price shall include all labor, material, equipment, and incidental costs required to complete work and provide a fully operating traffic control signal system during before and after construction. No separate payment will be made for maintenance of existing installations, the removal and stacking and transporting of existing traffic signal equipment. All costs in connection therewith shall be included in the lump sum price.

Conduit will be paid separately under Item 804.2, 2-inch Electrical Conduit Type NM-Plastic (UL), Item 804.3, 3-inch Electrical Conduit Type NM-Plastic (UL). Pull boxes will be paid separately under Item 811.31. All timing changes will be covered under Item 816.1. However, other connections within the controller cabinet will be covered under this item.

ITEM 823.70 HIGHWAY LIGHTING POLE AND LUMINAIRE REMOVED AND RESET EACH

The work under this item shall conform to the relevant provisions of Subsection 820 of the Standard Specifications, Supplemental Specifications, and the following.

The existing light poles and luminaires shall be removed and temporarily stored offsite to enable other contract work to proceed. The condition of the existing lighting materials to be stored shall be documented with photographs and provided to the Engineer prior to removal. Any undocumented damage to the existing materials that are evident when the materials are brought back to the site for resetting shall be repaired if feasible or the item shall be replaced at the Contractor's expense. The existing luminaires are fully functioning and shall be photographed at night prior to removal to establish the condition prior to temporarily storing.

All materials that cannot be reused shall be new. The light poles shall be reset on new bolts that are cast into the proposed moment slabs. The locations of the reset light poles and new conduit shall be confirmed at the site with the Engineer prior to placing the moment slab concrete to check ADA compliance.

METHOD OF MEASUREMENT

Item 823.70, Highway Lighting Pole and Luminaire Removed and Reset will be measured by each reset installation, complete in place, including foundations and all conduit, sweeps, hardware, wiring, and all miscellaneous work, tested and fully functioning.

BASIS OF PAYMENT

Item 823.70, Highway Lighting Pole and Luminaire Removed and Reset will be paid at the contract bid price per each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 852.11 TEMPORARY PEDESTRIAN BARRICADE FOOT
ITEM 852.12 TEMPORARY PEDESTRIAN CURB RAMP EACH

DESCRIPTION

The work to be done under these items consist of furnishing, deploying, maintaining in proper operating condition, and removing temporary pedestrian barricades and temporary pedestrian ramps as part of a Temporary Pedestrian Access Route (TPAR) in order to guide pedestrians around a fully or partially closed sidewalk. These devices are intended to prevent pedestrians from entering the work area and to prevent pedestrians from inadvertently entering the vehicle travel lane by providing visual and physical separation between each space.

MATERIALS

The Temporary Pedestrian Barricade shall have a continuous bottom rail or edge no more than two (2) inches above the ground and eight (8) inches in height (minimum) to accommodate cane users, have a smooth and continuous hand railing along the top edge no less than 32 inches above the ground and not obstruct or project into the pedestrian path of travel. Barricade walls shall be nearly vertical and generally within the same plane.

If exposed to traffic, Temporary Pedestrian Barricades shall be crashworthy.

The Temporary Pedestrian Curb Ramp shall provide a 48-inch minimum width, with a firm, stable, and non-slip surface. Protective edging with a two (2) inch minimum height shall be installed when the curb ramp or landing platform has a vertical drop of six (6) inches or greater.

The Temporary Curb Ramp walkway and landing area shall be of a solid, continuous, contrasting color abutting up to the existing sidewalk,

If a Temporary Pedestrian Curb Ramp leads to a crosswalk, a detectable warning pad shall be used at the base of the ramp; if it leads to a protected path that does not conflict with vehicular traffic then a detectable pad shall not be used.

CONSTRUCTION METHODS

The Temporary Pedestrian Barricade shall be placed in an area that will provide pedestrians with a TPAR on a smooth, continuous hard surface for its entirety. The geometry and alignment of the facility shall meet the applicable requirements of the “Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities” and the Massachusetts Architectural Access Board.

The recommended width of the TPAR is 60 inches, but if constraints exist a minimum clear width of 48 inches shall be provide along its entirety. If a 60-inch width cannot be accommodated in full, a 60 inch by 60 inch passing space shall be provided every 200 feet or less along the TPAR.

ITEMS 852.11 and 852.12 (Continued)

Turning areas shall be 60 inches by 60 inches minimum.

Lateral joints between any surfaces shall not exceed 0.5 inches. Lateral edges may be vertical up to 0.25 inches high and shall be beveled at 1V:2H between 0.25 inches and 0.5 inches.

The TPAR shall be kept clear of debris, snow, and ice and the Temporary Pedestrian Barricades and temporary Curb Ramps shall not obstruct drainage.

Removal and/or resetting of Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall be considered incidental.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for Temporary Pedestrian Barricades will be made at the contract price per foot installed in place, including all incidental items. This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition.

Payment for Temporary Pedestrian Curb Ramps will be made at the contract price per each unit installed in place, including all incidental items. This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition.

ITEM 859.1 REFLECTORIZED DRUMS WITH SEQUENTIAL DAY FLASHING WARNING LIGHTS

The work under this Item shall conform the relevant provisions of Subsection 850 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, maintaining in proper operating conditions, and removing reflectorized drums, and any necessary ballast, equipped with sequential flashing warning lights.

MATERIALS

Reflectorized drums shall be listed on the MassDOT Qualified Traffic Control Equipment List.

Reflective sheeting on drums shall meet or exceed ASTM D4956 Type VIII. All drums shall be maintained in a satisfactory manner including the removal of oils, dirt, and debris that may cause reduced retroreflectivity.

The Contractor shall use one of the following sequential flashing warning light systems unless otherwise approved by the Engineer:

1. Empco-Lite LWCSD.
2. pi-Lit® Sequential Barricade-Style Lamp; or
3. Unipart Dorman SynchroGUIDE.

Sequential flashing warning lights shall be secured to reflectorized drums per the light manufacturer's specifications.

CONSTRUCTION METHODS

The first ten (10) drums in any merging or shifting taper as designated in the Temporary Traffic Control Plan shall be equipped with sequential flashing warning lights. These lights shall be operating, at a minimum, between dusk and dawn when the taper is deployed.

The successive flashing of the sequential warning lights shall occur from the upstream end of the merging or shifting taper to the downstream end of the taper in order to identify the desired vehicle path. Each warning light in the sequence shall be flashed at a rate of not less than 55, nor more than 75 times per minute.

Warning lights shall be powered off when drums are not deployed in a taper.

ITEM 859.1 (Continued)

METHOD OF MEASUREMENT

A group of ten (10) reflectorized drums with sequential flashing warning lights is considered one (1) unit and will be measured by the day. Each period of up to 24 hours during which this unit is in use will be measured as one day regardless of the number of times that the drums are positioned, repositioned, removed, or returned to service.

BASIS OF PAYMENT

Reflectorized Drums with Sequential Flashing Warning Lights will be paid for at the contract unit price per day, which shall include full compensation for furnishing, positioning, repositioning, and removing the group of ten (10) drums as directed by the Engineer.

ITEM 864.41 GREEN COLORIZED PAVEMENT MARKINGS SQUARE FOOT

Work under this item consists of furnishing and installing Colorized Pavement Markings at the locations shown on the plans or as required by the Engineer. All work shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

MATERIALS

Colorized Pavement Markings are composed of Epoxy, Methyl Methacrylate (MMA), or Preformed Thermoplastic Materials.

The initial daytime chromaticity coordinates for green colorized pavement shall fall within the area created by the following coordinates:

Initial Daytime Chromaticity Coordinates (Corner Points) for Green Colorized Pavement Markings

	1	2	3	4
x	0.230	0.266	0.367	0.444
y	0.754	0.460	0.480	0.583

The initial daytime chromaticity coordinates for red colorized pavement shall fall within the area created by the following coordinates:

Initial Daytime Chromaticity Coordinates (Corner Points) for Red Colorized Pavement Markings

	1	2	3	4
x	0.420	0.450	0.560	0.540
y	0.330	0.380	0.370	0.320

The surface of the Colorized Pavement Markings shall provide a minimum skid resistance value of 55 British Pendulum Number (BPN) when tested in accordance with ASTM E303.

The Contractor shall provide a Certificate of Compliance verifying the product supplied meets the specified daytime chromaticity requirements and friction requirements prior to installation.

CONSTRUCTION METHODS

The Contractor shall supply Shop Drawings to the Engineer for approval a minimum of 30 days in advance of installation. Shop Drawings shall include the product manufacturer's instructions, material safety data sheets (MSDS) for all components including any primers and sealers, and all tools, equipment, and procedures to be used for the installation.

No work shall commence until the Shop Drawings have been approved.

ITEM 864.41 (Continued)

It shall be the responsibility of the Contractor to prepare the surface prior to the installation of any Colorized Pavement Markings. Any joints or cracks in the pavement shall be pre-treated per the manufacturer's recommendation. The surface shall be clean and dry prior to installation of the system. If additional surface preparation is recommended by the manufacturer, such as the installation of a primer or preheating, it shall be completed per the manufacturer's specifications. All surface preparation shall be considered incidental to the cost of the item.

Any existing pavement markings that conflict with the Colorized Pavement Markings shall be removed by the Contractor in advance of installation; installation of colorized pavement over pavement markings shall not be allowed. All existing pavement markings that are to remain, castings, curbs, and rumble strips within the vicinity of the colorized pavement application shall be covered and protected by the Contractor. Existing pavement markings damaged by the Colorized Pavement Markings installation shall be removed and replaced by the Contractor at no additional cost.

The Contractor shall follow all installation instructions from the manufacturer, including allowable ranges of temperature and humidity for installation, unless otherwise approved by the Engineer.

Upon completion of installation, a sealer shall be applied if recommended by the manufacturer. The sealer shall be installed per the manufacturer's specification. The application of a sealer shall be considered incidental to the cost of the item.

The Contractor shall maintain protection of the Colorized Pavement Markings installation from vehicle and foot traffic throughout the minimum cure time recommended by the manufacturer.

METHOD OF MEASUREMENT

Item 864.41 will be measured for payment by the Square Foot of colorized pavement marking, complete in place.

BASIS OF PAYMENT

Item 864.41 will be paid for at the contract unit price per Square Foot, which price shall include all material, labor, equipment, and incidental costs required to complete the work.

ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED EACH

The work to be done under this Item shall consist of the dismantling, removing, and disposal of all existing street name signs, and regulatory and warning signs and their supports as noted on the plans and/or as required by the Engineer.

Also included is the excavation of the existing foundations. If, in the opinion of the Engineer, the existing foundation will not interfere with new construction, it may be removed to a depth of 6-inch below the existing ground, the hole backfilled with gravel and compacted, and the existing surfaces restored or replaced in kind.

The existing signs shall not be removed until the new signs and structures replacing them are ready for traffic unless otherwise required by the Engineer.

METHOD OF MEASUREMENT

Item 874.41 will be measured for payment by the each, for each traffic sign removed and discarded.

BASIS OF PAYMENT

Item 874.41 will be paid for at the Contract Unit Price per Each, which price shall include all labor, material, equipment, and incidental costs required to complete the work, including dismantling, removing and discarding of the signs and their supports, excavation and disposal of the existing foundation, supplying and placing of gravel backfill and compaction, and the restoration or replacement in kind of disturbed surfaces.

ITEM 904.33 PRECAST CONCRETE PANELS SQUARE FOOT

Work under this item shall conform to the relevant provisions of Subsection 901 and Section M4.09.0: Precast, Prestressed, and Prefabricated Concrete Products of the Standard Specifications and the following:

The work under this Item consist of furnishing and installing precast concrete panels for the soldier pile and lagging walls shown on the plans.

The precast panels shall consist of 5000 psi, ¾", 685 HP Cement Concrete.

Reinforcing steel shall be epoxy coated and the panels shall have recessed lifting hooks. The Contractor shall patch over the recessed lifting hooks on the top panel with Cement Mortar.

Cement Mortar shall meet the requirements of M4.02.15

Color samples of the precast panels shall be submitted to the Engineer for review. The purpose for the color samples is to match as closely as practical the other HP Concrete mixes on the project including the guardrail transitions, sidewalks and concrete slabs (moment slabs) over the wing walls.

METHOD OF MEASUREMENT

Item 904.33 will be measured for payment by the Square Foot of precast concrete panel, complete in place.

BASIS OF PAYMENT

Item 904.33 will be paid for at the Contract unit price per Square Foot, which price shall include all labor, materials, tools, equipment, staging, access, removals, storage, the cost of all field measurements and survey required, and incidental costs required to complete the work.

No separate payment will be made for Cement Mortar, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 909.5 RAPID HARDENING CEMENTITIOUS PRODUCTS FOR CONCRETE REPAIRS CUBIC YARD

The work under this Item shall conform to the relevant provisions of Subsection 901 and Section M4.06.4: Rapid Hardening Concrete of the Standard Specifications and the following:

The work under this Item shall consist of furnishing and placing rapid hardening cementitious material that is suitable to repair concrete and pavement surfaces on bridges as required by the Engineer during construction for items such as deck spalls, joints or sidewalks so that both vehicular and pedestrian traffic during construction can be maintained.

Please note the following requirements specified herein:

- A product listed on the Department Qualified Construction Materials List (QCML) for Rapid Hardening Cementitious Products for Concrete Repair (Horizontal & Vertical/Overhead) shall be selected. All the manufacturer's recommendations shall be met.
- When concrete is exposed to air temperatures falling below, or expected to fall below 40°F, cold weather concreting methods shall be required. The Contractor shall, where practical, apply insulating materials, heaters, and / or enclosures to ensure that the concrete stays above the required temperatures (see *Cold Weather Concreting* section).
- When concrete is exposed to air temperatures falling below, or expected to fall below 40°F, the Contractor shall develop and submit to the Department for review and approval, a Cold Weather Concreting Plan, for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather (see *Cold Weather Concreting* section).
- In instances where the Engineer identifies the situation as an emergency, the Engineer may identify the repair as temporary, and have requirements of this specification waived. These temporary repairs shall be inspected and replaced when conditions are conducive to full compliance with this specification and prior to the end of the Contract.
- The Contractor shall notify the Department ten (10) days prior to the scheduled date of the verification trial batch testing.

All requirements identified above shall be performed in accordance with these specifications.

MATERIALS

Rapid hardening cementitious products for concrete repairs shall be packaged, dry, and preblended with preformulated constituent materials (excluding mixing water) to produce a mortar or concrete with acceptable quality characteristics and material properties, including rapid time of set, compressive strength, flexural strength, slant shear bond strength, and resistance to alkali silica reaction, freezing, thawing, and de-icing cycles, shrinkage, expansion, and sulfate reaction for horizontal, vertical, and overhead structures repair applications only.

ITEM 909.5 (Continued)

Table 909.5-1: Types of Rapid Hardening Cementitious Products for Concrete Repairs

Type	Description	Application
R1	General Rapid Hardening	Vertical and Overhead Repairs
R2	Medium Rapid Hardening	Vertical and Overhead Repairs
R3	Very Rapid Hardening	Horizontal, Vertical, and Overhead Repairs

Rapid hardening mortar products for concrete repairs shall be defined as products containing aggregate of which less than 5% by mass of the total mixture is retained on the 3/8 in. sieve and be used only on repair depths of 2 in. or less. Rapid hardening concrete products for concrete repairs shall be defined as products containing aggregate of which 5% or more by mass of the total mixture is retained on the 3/8 in. sieve and be used only on repair depths greater than 2 in.

Rapid hardening cementitious products for concrete repairs shall maintain valid participation in the National Transportation Products Evaluation Program (NTPEP) and listing on the Department Qualified Construction Materials List (QCML) and meet ASTM C928, the Manufacturer's instructions and recommendations, and the requirements specified herein. The product's NTPEP test results shall meet Table 909.5-2.

The product shall be extended using clean non-reactive aggregates from a MassDOT approved source according to a formulation acceptable to the manufacturer. Submit certified test reports showing the aggregate is non-reactive. Aggregate specified, labeled and furnished by the rapid hardening cementitious material manufacturer may be used with approval of the Engineer. The mixing process for expanding the rapid hardening cementitious material shall be performed per the Manufacturer's recommendations.

Products that are extended with additional constituent materials not included in the original product packaging or products with modifications to the original product formulation shall be evaluated through Department Mix Design Evaluation and Verification Testing in addition to the requirements specified herein. The Contractor shall report proposed mix design formulations onto the Department issued mix design sheet in its entirety and submit to the Department for evaluation.

Mix design formulations shall be designed with precise proportions of constituent materials, yielding 27.0 ± 0.40 cubic feet of cement concrete. All required mix design targets shall be reported on the Department issued mix design sheet for each proposed mix design. The product's additional verification test results shall meet Table 909.5-3.

ITEM 909.5 (Continued)

Table 909.5-2: Verification Testing Requirements

Property	Method	Quality Characteristic		Verification Limits					
				R1		R2		R3	
				Min.	Max.	Min.	Max.	Min.	Max.
Uniformity	T 119	Slump (in.)		–	–	–	–	3	–
	C1437	Flow (%)		–	–	–	–	100	–
Setting	T 131	Initial Set (min.)		–	–	–	45	20	30
		Final Set (min.)		–	–	–	180	–	60
Strength	T 22[1] Or T 106[2]	Compressive Strength (psi)	3 Hours	500	–	1000	–	3000	–
			24 Hours	2000	–	3000	–	5000	–
			7 Days	4000	–	4000	–	5000	–
			28 Days	4000	–	4000	–	5000	–
	T 97	Flexural Strength (psi)	24 Hours	–	–	–	–	650	–
			7 Days	–	–	–	–	–	–
	C882	Slant Shear Bond Strength (psi)	24 Hours	1000	–	1000	–	1000	–
			7 Days	1500	–	1500	–	1500	–
Durability	T 358	Surface Chloride Ion Penetration Resistance (kΩ-cm)	28 Days	21	–	21	–	21	–
	T 161 (A)	Relative Durability Factor		90	–	90	–	90	–
		Mass Loss (%)		–	6.0	–	6.0	–	6.0

[1] For rapid hardening concrete products, AASHTO T 22 shall be performed.
[2] For rapid hardening mortar products, AASHTO T 106 shall be performed.

ITEM 909.5 (Continued)

Table 909.5-3: Additional Verification Testing Requirements for Extended Products

Property	Method	Quality Characteristic	Verification Limits	
			Min.	**Max.**
Uniformity	T 119	Slump (in.)[1]	For Information	
	T 121	Unit Weight (lbs / ft^3)[1]	Target -1.5	Target +1.5
Workability	T 119	Segregation Resistance[2]	Pass	
Thermal	T 309	Concrete Temperature (°F)	50	90
Strength	T 22	Compressive Strength (psi)[3][4]	Table 909.5-2	
Durability	T 152	Air Content (%)[1]	For Information	
	T 358	Surface Chloride Ion Penetration Resistance (kΩ-cm)[3]	Table 909.5-2	

[1] Prior to mix design verification testing, the Contractor shall identify and report the proposed mix design targets onto the Department issued cement concrete mix design sheet. Any adjustments made to the proposed mix design targets shall be based on the verification test results, and are subject to Department approval and the requirements specified herein.

[2] Testing for segregation resistance shall be performed while the concrete is being discharged and during AASHTO T 119 Standard Method of Test for Slump of Hydraulic Cement Concrete. Visual signs of segregation include coarse particles advancing in front of or behind the fine particles and mortar and a tendency for coarse aggregate to separate from the mortar, particularly when the mixture is being consolidated.

[3] Three (3) 4 x 8 in. cylinders shall be cast and tested for each age identified.

[4] For cold weather concreting applications, ASTM C1074 Standard Practice for Estimating Concrete Strength by the Maturity Method may be used for determining strength during production. Prior to production, maturity method strength curves shall be developed with validated compressive strength specimens.

CONSTRUCTION

The surface to receive the rapid hardening repair material shall be properly prepared and free from frost, ice, mud, water, grease, dirt, and any other materials that will hamper the bond.

Prior to placing the rapid hardening repair material, the patch area shall be flushed with clean potable water to remove all dust and then blasted with oil free compressed air to remove all standing water.

The rapid hardening repair material shall be cured and protected until the minimum compressive strength is achieved.

ITEM 909.5 (Continued)

The Contractor shall be required to mix and place the cement by using an eight (8) cubic foot minimum rubber-blade mobile mixer. Two (2) mixers will be required to be on site, of which one mixer can be used as a back-up. Sufficient mixing and placing equipment shall be provided on the construction site by the Contractor to ensure that a breakdown of equipment will not cause significant delays in completing the scheduled work in the shift.

Approval by the Engineer for all formwork shall be required prior to placement of any concrete.

The Engineer may require the Contractor to vibrate and/or power screed the patched area. Payment for such equipment shall be considered incidental to this Item.

At the direction of the Engineer, in order to minimize the effects of vibrations from vehicular traffic passing in adjacent lanes next to each placement, traffic should be slowed along the adjacent travel lanes and the placement of concrete overlay should be executed between the hours of lower traffic volumes, generally between 1:00 AM and 2:30 AM

Rapid hardening concrete placements shall be completed no later than 2:30 AM for nighttime operations so that the required compressive strength of 2000 psi is attained before the area is opened to traffic no later than 5:30 A.M.

Formwork shall be maintained and remain in place a minimum of seventy-two (72) hours after placement.

All formwork placed under this contract must be removed no later than forty-five (45) days after it was initially placed. Failure to remove formwork within forty-five (45) days may result in its removal by others with the associated costs being assessed to the Contractor.

Cold Weather Concreting

Cold weather concreting shall be defined as the procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather conditions, while exposed to air temperatures falling below, or expected to fall below 40°F.

The protection period shall be defined as the minimum duration required to prevent concrete from the negative effects of cold weather exposure. The protection period shall remain in place while cold weather conditions exist. Controlled and gradual termination of the protection period shall be conducted only after 100% f'_c is attained and all specified conditions are met.

The procedures, operations, materials, and equipment selected for cold weather concreting shall adequately maintain specified temperature ranges by addressing all variables, including ambient weather conditions, geometry of the structure, and mix design proportions. Concrete temperatures for cold weather concreting shall meet Table 909.5-4.

ITEM 909.5 (Continued)

Table 909.5-4: Concrete Temperature Requirements for Cold Weather Concreting

Phase	**Cold Weather Temperature (°F)**	**Thickness of Sections (ft.)**			
		< 1	**1-3**	**3-6**	**> 6**
		Concrete Temperature (°F)			
Mixing	30-39	60-75	55-70	50-65	45-60
	0-30	65-80	60-75	55-70	50-65
	< 0	70-85	65-80	60-75	55-70
Placement	< 40	55-75	50-70	45-65	40-60
Protection Period	< 40	55-75	50-70	45-65	40-60
Termination of Protection Period	< 40	**Rate of Concrete Temperature Decrease in 24 Hours (°F)**			
		≤ 50	≤ 40	≤ 30	≤ 20

Cold weather concreting procedures, operations, materials, and equipment shall be developed and performed to prevent damage to concrete due to freezing at early ages, to ensure that the concrete develops the recommended strength for safe removal of forms, to maintain curing conditions that promote quality strength and durability development, to limit rapid temperature fluctuation, and to provide protection consistent with intended serviceability of the structure.

The Contractor shall develop and submit to the Department for review and approval, a Cold Weather Concreting Plan, for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather, including:

- Procedures for protecting the subgrade from frost and the accumulation of ice or snow on reinforcement or forms prior to placement
- Methods and requirements for cold weather protection and temperature control of constituent materials incorporated into the mix design
- Chemical admixtures incorporated into the mix design for cold weather protection and temperature control
- Methods and requirements for cold weather protection and temperature control during mixing, delivery, placement, finishing, curing, and protection period
- Curing methods to be used during and following the protection period
- Types of covering, insulation, heating, or enclosures to be provided
- Methods for verification of in-place strength
- Procedures for measuring and recording concrete temperatures
- Procedures for preventing drying during dry, windy conditions

All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

ITEM 909.5 (Continued)

Insulating Materials

Insulating materials used for cold weather concreting shall meet the requirements specified herein. The thermal resistance of the proposed insulation system shall be determined to meet the concrete temperature range requirements specified herein. Supplemental heat, including hydronic heating systems, shall be applied in instances where insulating materials cannot achieve the concrete temperature requirements.

Heaters

Heaters used for cold weather concreting including direct fired, indirect fired, and hydronic heaters shall meet ANSI A10.10 carbon monoxide limits, safety regulations for ventilation, and the stability, operation, fueling, and maintenance of heaters and the requirements specified herein.

- Direct Fired Heaters: Direct fired heaters generate heat to an enclosed space through the combustion of fossil fuels, including oil, kerosene, propane, gasoline, and natural gas. Hot air comprised of carbon dioxide and carbon monoxide combustion products, is discharged into the enclosed space. Direct fired heaters shall be prohibited from heating the air directly surrounding the concrete surface due to calcium carbonate formation interfering with the hydration reaction, from the reaction between the carbon dioxide generated from the combustion of fossil fuels and the calcium hydroxide on the surface of freshly placed concrete, resulting in a soft, chalky, and nondurable concrete surface. Direct fired heaters shall only be used on concrete surfaces protected from fossil fuel combustion products.
- Indirect Fired Heaters: Indirect fired heaters generate heat to an enclosed space through the combustion of fossil fuels, including oil, kerosene, propane, gasoline, and natural gas. The carbon dioxide and carbon monoxide combustion products are expelled through venting, resulting in clean heated air discharged into the enclosed space. Indirect fired heaters are suitable for heating the air directly surrounding the concrete surface.
- Hydronic Heaters: Hydronic heaters generate heat to an enclosed space through the circulation of the heat-transfer fluid in a closed system of pipes or hoses. The heat-transfer fluid is comprised of a propylene glycol water solution and is heated through the combustion of fossil fuels, including diesel fuel and kerosene. The combustion of fossil fuel occurs outside of the enclosed space and does not expose the concrete surface to the deleterious effects of carbon dioxide. After the concrete placement achieves final set, polyethylene film or other suitable material shall sufficiently serve as a vapor barrier. The heat-transfer hoses shall be placed on top of the vapor barrier and covered with insulating materials. Hydronic heaters shall be used to thaw or preheat subgrades prior to concrete placement and provide supplementary heat to insulating materials. Hydronic heaters shall provide an even distribution of heat to prevent curling and cracking induced by temperature gradients within concrete.

ITEM 909.5 (Continued)

Enclosures

Enclosures shall be made of wood, canvas tarpaulins, polyethylene film, or prefabricated rigid plastic. Enclosures shall be airtight, block wind, prevent admittance of cold air, conserve heat, and withstand wind and snow loads. Enclosures shall provide adequate headroom for craftsmen and sufficient space between the concrete and the enclosure to permit free circulation of warm air. Supplementary heat shall be supplied to enclosures by hydronic heaters, live steam, hot forced air, or indirect fired combustion heaters. Icing along the perimeter of the enclosure shall be prevented when live steam is utilized. Heaters and ducts shall be positioned to prevent the hot, dry air from overheating or drying the concrete surface. Insulating materials shall be applied as a vapor barrier to the concrete surface immediate after final set is attained.

Steel Deck Plates

In areas where it is not possible for a rapid patch repair to the concrete deck to develop sufficient strength to withstand vehicular loading, the Contractor shall use steel deck plates conforming to AASHTO M270 Grade 36 or 50, the relevant provisions of Subsection 960 and Subsection M8.05.0 of the Standard Specifications. Steel deck plates shall be required at locations as directed by the Engineer, including:

- Bridge S-24-026, Stage 1 – Over the deck spanning between existing beams E5 and E6 in the vicinity north of the southern-most interior diaphragm (deteriorated area is approximately 7 ft long)

The costs associated with any required steel plates shall be incidental to this item.

METHOD OF MEASUREMENT

Item 909.5 will be measured for payment by the Cubic Yard of rapid hardening concrete furnished and installed complete in place.

BASIS OF PAYMENT

Item 909.5 will be paid at the Contract unit price per Cubic Yard, which price shall include all labor, materials, tools, equipment, and all incidental costs required to complete the work as required by the Engineer, including installation and subsequent removal of all formwork. Any required trial batching and acceptance testing including the cost associated with hiring certified technician shall also be incidental to this Item.

Where formwork is placed for a full depth repair, payment will be made at 70% of the measured volume, the remaining 30% will be made upon the removal of the formwork.

ITEM 912.4 DRILLED AND GROUTED #4 DOWELS EACH
ITEM 912.5 DRILLED AND GROUTED #5 DOWELS EACH

The work under these items shall conform to the relevant provisions of Subsection 901 of the Standard Specifications and the following:

The work shall consist of drilling holes, furnishing, installing, and grouting steel dowel reinforcement at the locations shown on the drawings or as required by the Engineer.

All dowels shall be rolled from new built steel conforming to the requirements of AASHTO M31 Grade 60. All dowels shall be epoxy coated in accordance with AASHTO A775 or shall be galvanized in accordance with ASTM A767.

Reinforcing Steel manufacturer shall be listed on the Qualified Construction Materials List (QCML).

METHOD OF MEASUREMENT

Items 912.4 and 912.5 will be measured for payment by each dowel furnished and installed, complete in place.

BASIS OF PAYMENT

Items 912.4 and 912.5 will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment, furnishing dowels, drilling holes, grouting the dowels regardless of the diameter or depth of the hole, and all incidental costs required to complete the work.

ITEM 942.102	**STEEL PILE HP 10 X 57**	**FOOT**
ITEM 942.283	**STEEL PILE W18X283**	**FOOT**
ITEM 942.311	**STEEL PILE W18X311**	**FOOT**
ITEM 942.89	**STEEL PILE W16X89**	**FOOT**

Work under these items shall conform to the relevant provisions of Subsection 940 of the Standard Specifications and the following:

The Contractor shall submit procedures for setup and securement of equipment such as drill rigs and cranes with potential to foul tracks that will include predefined precautions such as including swing-limiting controls, oversizing matting and dunnage for supporting equipment, etc.

METHOD OF MEASUREMENT

Items 942.102, 942.283, 942.311, and 942.89 will be measured for payment in accordance with Subsection 940.80 of the Standard Specifications.

BASIS OF PAYMENT

Items 942.102, 942.283, 942.311, and 942.89 will be paid for in accordance with Subsection 940.81 of the Standard Specifications.

ITEM 945.10	**DRILLED MICROPILES**	**FOOT**
ITEM 948.60	**MICROPILE VERIFICATION LOAD TEST**	**EACH**
ITEM 948.61	**MICROPILE PROOF LOAD TEST**	**EACH**

The work under these Items shall conform to the relevant provisions of Section 900 of the Standard Specifications and the following:

This work shall consist of constructing micropiles as shown on the plans, approved working drawings, and as specified herein. The Contractor is responsible for furnishing all materials, equipment, labor, services, and supervision; and for selecting means and methods for the installation and testing of micropiles for this project.

Micropiles shall consist of permanent casing sections and fully reinforced grout sections bonded with bedrock. Permanent casings shall be included as part of the micropiles and shall remain in place after grouting is complete. Temporary casings shall be installed if necessary to facilitate micropile construction and shall be removed during or after grouting. The Contractor is responsible for drilling through obstructions encountered during pile installation.

The micropiles load capacities shall be confirmed by verification and proof load testing. Testing must meet the test acceptance criteria specified herein. The bond length of the micropile may be modified by the Engineer, pending results of load testing performed as an initial part of the work.

MATERIALS

The materials for micropiles shall meet the following requirements:

Permanent/Drill Steel Casing used as Reinforcement: Permanent steel casing/pipe used as reinforcement shall be new "Prime" steel meeting the requirements of any API 5L PSL1 pipe with a yield strength of 52 ksi with SR15 supplemental requirements. The grade of the prime steel casing shall conform to the properties shown on the Plans. For steel pipe that is to be welded, the Carbon Equivalency, as defined in AWS D1.1 Section XI.1, shall be less than or equal to 0.45, as demonstrated by mill certificates. The sulfur content shall not exceed 0.05%, as demonstrated by mill certificates.

Permanent steel casing shall consist of ERW (Electric Resistance Welded) and/or seamless steel casing and shall be designed to withstand the design loadings determined by the Engineer or shown on the Plans and the verification/proof test loading described in this specification. Joints shall develop the full vertical capacity, and at least 60% of the moment capacity of the casing. As installed, there shall be no joints within three feet or as shown on the plans from the bottom of the pile cap.

The steel casing shall have certified mill test reports and shall be submitted for record purposes as the materials are delivered. The steel shall be traceable back to the mill certifications, and be free from defects (dents, cracks, tears, etc.).

ITEMS 945.10, 948.60, and 948.61 (Continued)

New "mill secondary" steel pipe/casing will not be accepted regardless of if they are accompanied by coupon test results.

Permanent steel casing shall be installed a minimum of 12 inches into intact bedrock.

Reinforcing Bars: Central reinforcing steel shall be full-length, continuously threaded bars. The bars shall conform to AASHTO M 31 Grade 60 or Grade 75, or AASHTO M 275 Grade 150 as shown on the Contract Documents. The grade and size of the central reinforcement shall conform to any minimum and/or maximum properties shown on the Plans.

Reinforcing Bar Couplings: Reinforcing bar couplers shall be in accordance with Subsection M8.01.9 but are not required to be listed on the Qualified Construction Materials List (QCML). Where reinforcing bars are not specified with corrosion protection, bar couplers shall not be required to be epoxy coated or galvanized.

Independent testing shall be performed by a nationally recognized testing laboratory, approved by the Engineer, which shall provide certified test results showing that the reinforcing bar coupler meets the requirements of Subsection M8.01.9. Acceptance of the couplers shall be approved by the Engineer.

Centralizers and Spacers: Centralizers and spacers shall be fabricated from schedule 40 PVC pipe or tube, or material non-detrimental to the reinforcing steel. Wood shall not be used.

They shall be securely attached to the reinforcement; sized to position the reinforcement to provide the grout cover specified in the table below; sized to allow grout tremie pipe insertion to the bottom of the drill hole; and sized to allow grout to freely flow up the drill hole and casing.

Table 1 - Minimum Grout Cover for Steel Reinforcement

Condition	Minimum Cover on Bar (in.)	Minimum Cover on Coupler (in.)
Micropiles in Soil	1	¼
Micropiles in Rock	½	¼
Coated or Encapsulated Bars	½	¼

ITEMS 945.10, 948.60, and 948.61 (Continued)

Admixtures for Grout: Admixtures shall conform to the requirements of AASHTO M 194 and shall be selected from the QCML where applicable. Expansive admixtures shall only be added to the grout used for filling sealed encapsulations or micropile top connections. Accelerators are not permitted. Admixtures containing intentionally added chlorides are not permitted. Admixtures shall be from the same Manufacturer and shall be compatible with the grout and mixed in accordance with the Manufacturer's recommendations.

Admixtures that control bleed, improve flowability, reduce water content, and retard set may be used in the grout subject to review and acceptance by the Engineer.

Cement: All cement shall conform to AASHTO M 85 Type I or Type II, and shall be the product of one Manufacturer.

Grout: Neat cement mixture with a minimum 3-day compressive strength of 50 percent of the 28-day unconfined compressive strength. The grout shall be proportioned and mixed as to provide a fluid grout capable of maintaining the solids in suspension without appreciable bleed. Preparation and placement of grout shall be in accordance with the recommendations of "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," ACI 304.

A minimum of 60 calendar days prior to the start of micropile construction the grout mix design shall be submitted to the Engineer and a trial batch shall be performed. The trial batch shall take place at a location approved by the Engineer and be performed in the presence of Department personnel. It shall be representative of the production grout placement and shall consist of the same materials, equipment, methods of mixing, and sample preparation and curing methods.

Trial batch samples will be tested to verify that the material meets all grout criteria specified in Table 2. The quantity of material batched shall be sufficient to perform all required tests specified.

Table 2 – Grout Material Acceptance Criteria for Trial Batch Testing

Quality Characteristic	Test Method	Engineering Limit
Minimum Compressive Strength:	AASHTO T 106 Or AASHTO T 22	
3 days		≥ 2,500 psi
7 days		For information only
28 days		≥ 5,000 psi
Consistency	API RP-13B-1	± 10% of the density specified in the mix design

ITEMS 945.10, 948.60, and 948.61 (Continued)

Plates and Shapes: Structural steel plates and shapes for pile top attachments shall conform to M8.05.0, AASHTO M 270, and have minimum yield strength of 50 ksi.

Water: Water for mixing grout shall be potable, clean, and free from substances that may be injurious to cement and steel.

Fillers: Inert fillers such as sand (conforming to AASHTO M 45) may be used in the grout in special situations, such as presence of large voids in the ground or when grout take and travel are to be limited, with prior written approval by the Engineer.

CONSTRUCTION

Qualifications

The Micropile Contractor must be experienced in the construction and load testing of micropiles and have successfully constructed at least 5 projects in the last 5 years involving construction totaling at least 100 micropiles with similar capacity and requirements specified in these plans and specifications. The Micropile Contractor shall have previous micropile drilling and grouting experience in soil/rock similar to project conditions and shall have available and be thoroughly familiar with the specialized type of equipment needed to perform work of this type.

The on-site foremen and drill rig operators shall also have experience on at least 3 projects over the past 5 years installing micropiles of equal or greater capacity than required in these plans and specifications.

Prior to the Pre-construction Meeting, the Micropile Contractor shall submit the following information to verify the firm's experience and the qualifications of personnel scheduled to perform the micropile design (load test frame) and construction:

1. Submit a list of at least five micropile projects successfully completed in the last five years. Include construction details, structural details, load test reports, and client contact for each project listed.
2. Submit a list of the equipment and resources the Micropile Contractor plans to mobilize and utilize for the performance of the project.
3. Provide the names and detail the experience of the micropile designer, on-site supervisor, foremen, and drill rig operators for this project.
4. A signed statement that the Micropile Contractor has inspected both the project site and all the subsurface information including any soil or rock samples made available in the Contract Documents.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Work on any micropiles shall not be started, nor materials ordered until the qualifications and submittals have been accepted by the Engineer. The Engineer may suspend the micropile construction if the Micropile Contractor substitutes unapproved personnel during construction. Requests for substitution of field personnel shall be submitted to the Engineer for acceptance. Additional costs resulting from the suspension of work will be the Micropile Contractor's responsibility, and no extension in contract completion date resulting from the suspension of work will be allowed.

The Micropile Contractor shall have on site during all micropile construction activity, a minimum of one Quality Control (QC) inspector. This person shall be responsible for quality control of the micropiles during all phases of construction and will monitor and document all QC inspection and testing activities required by the specifications and outlined in the accepted procedures and Working Drawings. The QC person shall be a certified NETTCP Concrete Technician.

Micropile Pre-Construction Submittals

The Contractor shall prepare and submit to the Engineer: shop drawings, a micropile installation plan, construction procedures, load testing procedures, and equipment calibrations for review and acceptance. The Contractor shall verify the limits of the micropile structure before preparing the detailed working drawings and allow the Engineer four (4) weeks to review the submittal after a complete set has been received. Work shall not begin, nor materials ordered until all submittals have been received, reviewed, and accepted in writing by the Engineer.

The micropile submittals shall include:

A. Plans

1. A plan view of the micropile layout identifying the locations of micropiles, numbering system for records, and verification test and proof test micropile locations.

2. An elevation view of the test micropile(s) showing:
    i. A typical detail of test micropiles defining the micropile length, reinforcement, inclination, and load test bonded and unbonded test lengths.
    ii. Permanent casing length and diameter, casing plunge length, and grout bond zone length.
    iii. Estimated soil/bedrock strata.
    iv. Instrumentation to be installed.
    v. Minimum drill hole diameter.
    vi. Splice type and locations.
    vii. Centralizers and spacers.
    viii. Corrosion protection details.
    ix. Grout design strength.

3. Details for constructing micropile structures around utilities, as applicable.

ITEMS 945.10, 948.60, and 948.61 (Continued)

B. Construction Procedures

1. Detailed step-by-step description of the proposed micropile construction procedure, including personnel, testing, and equipment to assure quality control. This step-by-step procedure shall be shown in sufficient detail to allow the Engineer to monitor the construction and quality of the micropiles. Include methods of drilling the holes, advancing the casing, drilling through or removing obstructions, flushing drilled holes, installing reinforcement, and grout pressures.

2. If welding of casing is proposed, submit the welding procedure. All welding shall be done in accordance with the current AWS Structural Welding Code.

3. Information on space requirements for installation equipment that verify the proposed equipment can perform at the site.

4. Plan to describe how surface water, drill flush, and excess waste grout will be controlled and disposed.

5. Certified mill test reports for the central reinforcing steel. The ultimate strength, yield strength, elongation, and material properties composition shall be included.

6. Certified mill test reports for the permanent casing. Certification that the permanent casing meets the supplemental requirements of SR15 shall be included.

7. Quality Control Plan. The QC Plan should sufficiently document the QC processes of all Contractor parties (i.e. Prime Contractor and Subcontractors) performing work required under this specification. The QC Plan shall be structured to follow the format and section headings outlined in the MassDOT Model QC Plan. It shall be submitted to the Engineer for review and approval a minimum of 30 days prior to the start of work.

   The QC Plan shall include complete descriptions, and details for the following:
   - i. Micropile installation including drilling method and grouting procedure.
   - ii. Grout mix design and type of materials to be used in the grout including certified test data and trial batch reports. The Micropile Contractor shall also provide specific gravity and density of the wet mix design.
   - iii. Methods and equipment for accurately monitoring and recording the grout depth and grout volume as the grout is being placed.
   - iv. Estimated curing time for grout to achieve specified strength. Previous test results for the proposed grout mix completed within one year of the start of grouting may be submitted for initial verification and acceptance, and start of production work. During production, grout shall be tested in accordance with the Grout Testing Requirement specified herein.
   - v. Procedure and equipment for Micropile Contractor monitoring of grout quality. At a minimum, the Micropile Contractor shall verify the specific gravity of the mixed grout prior to placement of the grout into each drilled micropile.

ITEMS 945.10, 948.60, and 948.61 (Continued)

C. Load Testing Procedures

Detailed plans and procedures for the proposed micropile load testing method. This shall include all drawings, details, and structural design calculations necessary to clearly describe the proposed test method, reaction load system capacity and equipment setup, types and accuracy of apparatus to be used for applying and measuring the test loads and pile top movements in accordance with the Micropile Load Testing section of this specification.

D. Equipment Calibration

Calibration reports and data for each test jack, pressure gauge, master pressure gauge, and electronic load cell to be used. The calibration tests shall have been performed by a certified testing laboratory, and tests shall have been performed within 90 calendar days of the date submitted. Testing shall not commence until the Engineer has reviewed and accepted the jack, pressure gauge, master pressure gauge, and electronic load cell calibration data.

Pre-Construction Meeting

A mandatory pre-construction meeting will be scheduled by the Engineer and held prior to the start of micropile construction. The Design Consultant, MassDOT Resident Engineer, MassDOT District Materials Engineer, Prime Contractor, and Micropile Contractor, including QC personnel, shall attend the meeting. The preconstruction meeting will be conducted to clarify the construction and QC requirements for the work, to coordinate the construction schedule and activities, specifically those pertaining to excavation for micropile structures, installation of temporary sheeting, anticipated subsurface conditions, micropile installation and testing, micropile structure survey control, and site drainage control.

Site Drainage Control

The Contractor shall control and properly dispose of drill flush and construction related waste, including excess grout, in accordance with related specifications within the Contract Documents, and all applicable local codes and regulations. Provide positive control and discharge of all surface water that will affect construction of the micropile installation. Maintain all pipes or conduits used to control surface water during construction. Repair damage caused by surface water at no additional cost. Upon substantial completion of the work, remove surface water control pipes or conduits from the site.

Excavation

Coordinate the work and the excavation so the micropile structures are safely constructed and remain stable at all times. Perform the micropile construction and related excavation in accordance with the plans and accepted submittals. No excavation deeper than those specified herein or shown on the plans will be made above or below the micropile structure locations without written acceptance of the Engineer.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Micropile Installation

A. General

The Micropile Contractor shall select the drilling method, the grouting procedure, and the grout pressure used for installation of the micropiles. The construction method shall incorporate any special construction requirements specified on the plans. The production micropiles and its construction method shall be identical to the accepted verification test piles.

When the plans require uncased drilling of the micropile into bedrock, the permanent and/or temporary casing shall be drilled a minimum 12 inches into intact bedrock or to a depth within the bedrock so as to prevent subsidence of over burden into the uncased and/or bond zone portion of the drill hole (i.e. the rock socket).

Piles shall be installed only in the presence of the Engineer's or MassDOT's Representative.

B. Location and Survey

Micropiles shall be located and marked using survey and a template by the Contractor who shall maintain and be responsible for all location and elevation stakes.

C. Drilling

The drilling equipment and methods shall be suitable for drilling through the conditions to be encountered, without causing damage to overlying or adjacent structures, buried structures, or utilities.

Temporary casing or other accepted method of pile drill hole support is required, when drilling within 10 feet of an existing foundation, or utility, and/or in caving or unstable ground, to permit the pile shaft to be formed to the minimum design drill hole diameter. The casing shall be of the type and thickness that can be installed without distortion. Casings that fail, fracture, or otherwise distort during drilling or after drilling shall, unless otherwise directed, be withdrawn or replaced at the Contractor's expense. The drill hole must be open along its full length to at least the design minimum drill hole diameter prior to placing grout and reinforcement. The Contractor's proposed method(s) to provide drill hole support and to prevent detrimental ground movements shall be reviewed by the Engineer. Detrimental ground movement is defined as movement which requires remedial repair measures, in order to maintain site conditions as determined by the Engineer. Do not progress a new hole, pressure-grout, or post-grout, within 8 feet of the pile to be installed until the grout for that micropile has set 12 hours or longer. Do not allow vibration or excessive wheel loads to influence piles during installation and construction.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Use of drilling fluid containing bentonite or any other non-reverting drilling fluid is not permitted. Use of polymer slurry to remove cuttings from the cased hole shall be approved by the Engineer.

Piles shall be installed using equipment capable of penetrating boulders, cobbles, bedrock, dense till material, granite blocks, timber, concrete, or other man-placed materials that hinder the advance of the pile.

Use of drop-type impact hammers and blasting are not permitted. Prior to the use of down the hole air drilling methods the Contractor shall provide temporary fencing or barriers as necessary to prevent cuttings from leaving the work area and entering the adjacent traffic lanes.

Micropiles shall not be installed using auger cast methods.

Permanent casing must be installed in a manner which will not loosen the adjacent soils and will result in intimate contact between the casing and the soil. Driving of casing will not be allowed. Drilling shall be performed such that cuttings and/or wash fluid return through the inside of the casing. External flush will not be allowed. The method of drilling used shall prevent the loss of ground due to erosion, jetting, or blow-in at the bottom of the casing. No open-hole drilling will be allowed unless accepted by the Engineer.

D. Ground Heave or Subsidence

During construction, the Contractor shall observe the ground conditions in the vicinity of the micropile construction site on a daily basis for signs of ground heave or subsidence. Immediately notify the Engineer if signs of movements are observed. The Contractor shall immediately suspend or modify drilling or grouting operations if ground heave or subsidence is observed, if the micropile structure is adversely affected, or if adjacent structures are damaged from the drilling or grouting. If the Engineer determines that the movements require corrective action, the Contractor shall take corrective actions necessary to stop the movement or perform repairs. When due to the Contractor's methods or operations or failure to follow the specified/accepted construction sequence, as determined by the Engineer, the costs of providing corrective actions will be borne by the Contractor.

E. Pipe Casing and Reinforcing Bars Placement and Splicing

Reinforcement shall be placed prior to grouting the drill hole. Reinforcement surface shall be free of deleterious substances such as soil, mud, grease, or oil that might contaminate the grout or coat the reinforcement and impair bond. Reinforcement in the bond zone [i.e. rock socket] shall extend the minimum required length.

The Contractor shall install all micropiles to the planned elevations.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Centralizers and spacers shall be provided at a maximum spacing of 10 feet on center. The upper- and lower-most centralizers shall be located a maximum of 5 feet from the top and bottom of the micropile, respectively. Centralizers and spacers shall permit the free flow of grout without misalignment of the reinforcing bar(s) and permanent casing. The reinforcing steel shall be inserted into the drill hole to the desired depth without difficulty. Partially inserted reinforcing bars shall not be driven or forced into the hole. The Contractor shall re-drill and reinsert reinforcing steel when necessary to facilitate insertion.

Lengths of casing and reinforcing bars to be spliced shall be secured in proper alignment and in a manner to avoid eccentricity or angle between the axes of the two lengths to be spliced. Splices and threaded joints shall meet the requirements of the Material section. Threaded pipe casing joints shall be located at least two casing outside diameters (O.D.) from a splice in any reinforcing bar. When multiple bars are used, bar splices shall be staggered at least 1 foot.

F. Grouting

Micropiles shall be grouted the same day the load transfer bond length is drilled, or the bond length shall be flushed prior to grouting procedures commence. The grouting equipment shall produce a grout free of lumps and undispersed cement. Admixtures, if used, shall be mixed in accordance with Manufacturer's recommendations. The Contractor shall have means and methods of measuring the grout quantity and pumping pressures during the grouting operations. The grout pump shall be a positive displacement pump equipped with a pressure gauge to monitor grout pressure. A second pressure gauge shall be placed at the point of injection into the pile top. The pressure gauge shall be capable of measuring pressures of at least 145 psi or twice the actual grout pressure used, whichever is greater. The grout shall be kept in agitation prior to pumping. Grout shall be placed within one hour of mixing. The grouting equipment shall be sized to enable each pile to be grouted in one continuous operation. The grout volume being pumped shall be measured to an accuracy of 10 percent.

The hole shall be flushed with clean water immediately prior to grouting, to remove all contaminated water and cuttings. The hole shall be flushed through the grout pipe fully extended to the bottom of the hole with the temporary casing (if any) in place. The water shall be pumped at a high velocity until the wash water at the top of the casing is clear. After flushing, the depth of the hole shall be measured to confirm that the hole is clean and no sediment exists at the bottom of the drilled rock-socket/bond length. Installation of the steel reinforcing and grouting shall be done immediately after flushing. In case of delay, the hole shall be re-flushed and rechecked prior to grouting as directed by the Engineer.

ITEMS 945.10, 948.60, and 948.61 (Continued)

The grout shall be injected from the lowest point of the drill hole, and injection shall continue until uncontaminated grout flows from the top of the pile. Temporary casing, if used, shall be extracted in stages ensuring that, after each length of casing is removed, the grout level is brought back up to the proposed level before the next length is removed. The use of compressed air to directly pressurize the fluid grout takes is not permissible. The tremie pipe or casing shall always extend below the level of the existing grout in the drill hole during grouting procedures. The grout takes shall be controlled to prevent excessive heave or fracturing of rock or soil formations. The entire micropile shall be grouted to the design cut-off level. Upon completion of grouting, the grout tube may remain in the hole, but must be filled with grout.

If the Contractor elects to use a post-grouting system, Working Drawings and relevant details including grouting pressure, volume, location and mix design, shall be submitted to the Engineer for review.

G. Construction Tolerance

Unless otherwise stated on the Plans, the following shall be the maximum construction tolerances for micropiles:

1. Centerline of piling shall not be more than 3 inches from indicated plan location.

2. Pile shall be plumb within 1 percent of total-length design plan alignment.

3. Battered piles inclined up to 1:6 shall be within 4 percent of design plan alignment.

4. Battered piles inclined greater than 1:6 shall be within 7 percent of design plan alignment.

5. Top elevation of pile shall be plus 1 inch or minus 2 inch maximum from vertical design elevation indicated.

6. Centerline of reinforcing steel shall not be more than 3/4 inches from indicated center of pile.

7. Minimum volume of grout placed shall be the 110% of the theoretical volume of the whole micropile length from bottom to top at time of grouting.

ITEMS 945.10, 948.60, and 948.61 (Continued)

H. Micropile Installation Records

The Contractor shall prepare and submit to the Engineer full-length installation records for each micropile installed. The records shall be submitted within one work shift after that pile installation is completed. The data shall be recorded on a micropile installation log. A separate log shall be provided for each micropile. The log for each micropile shall contain the following minimum information:

1. Project name, structure name, micropile number, and contract number.

2. Date and time of drilling, grouting, and completion.

3. Bottom elevation of the proposed footing and final top elevation of the micropile, to the nearest 0.1 feet.

4. Plumbness and deviation from design location and batter.

5. Micropile as-built information such as pile inclination, casing diameter and wall thickness, reinforcement size and length, casing length below bottom of footing, taped measurement inside casing to check cleanout, plunge length (cased bond length), bond length below casing, total pile length below and above bottom of footing, All dimensions shall be provided to the nearest 0.1 feet.

6. Drilling method, drill bit type and size, and drill operator's name.

7. Table showing the descriptions and approximate top and bottom elevation of each soil or rock layer encountered during pile drilling.

8. Grout mix, density, and quantity used, for initial grout and post-grout (if any) including cement type and admixtures.

9. Maximum and average grout pressure used during installation.

10. Damage (if any) to pile, description of any deviations from the design location and batter or from the approved pile design and installation procedures, and description of any unusual occurrences during drilling (including obstructions), installation, and grouting.

The example micropile installation log in the "Micropile Design and Construction Guidelines Manual," Report No. FHWA-NHI-05-039 or FHWA-SA-97-070 can be used as a reference in developing the micropile installation log.

The Contractor shall also submit within 2 weeks after installation of all piles, an as-built plan, certified by a surveyor, showing the as-installed location of all piles to the nearest ½ inch.

ITEMS 945.10, 948.60, and 948.61 (Continued)

CONSTRUCTION QUALITY ASSURANCE

Contractor Quality Control

The Contractor's QC personnel will perform Quality Control inspection, sampling, and testing to ensure that the processes are providing work conforming to the contract requirements. Inspection, sampling, and testing shall be documented on appropriate forms and provided to the Engineer. The Engineer will not sample or test for Quality Control or assist in controlling the Contractor's operations.

A. Testing

1. Grout consistency: As measured by grout density shall be determined by the Contractor per API RP-13B-1 at a frequency of at least one test per pile, conducted just prior to start of pile grouting. The Baroid Mud Balance used in accordance with API RP-13B-1 is an approved device for determining the grout density of neat cement grout. The measured grout density shall be within ±10% of the density specified in the grout mix design submittal.

2. Compressive Strength: Grout within the micropiles shall be tested by the Contractor's Quality Control Inspector to ensure that it attains the minimum required compressive strength.

   Micropile grout shall be sampled and cured in accordance with AASHTO R 64 (for 2 inch by 2 inch cubes) or T 23 (for 3 inch by 6 inch cylinders) and tested for compressive strength in accordance with AASHTO T 106 (for cubes) or T 22 (for cylinders). Grout samples shall be taken directly from the grout plant (on-site mixer and pump).

   The QC Technician will take the following sets of grout samples for QC testing:

   i. Verification Test Piles – three (3) sets of three (3) cubes or cylinders for 3-, 7-, and 28-day strength testing.
   ii. Proof Test Piles – three (3) sets of three (3) cubes or cylinders for 3-, 7-, and 28-day strength testing.
   iii. Production Piles – one (1) set of three (3) cubes or cylinders for 28-day strength testing for every two (2) micropiles or one set from each grout plant on each day of operation; whichever occurs more frequently.

   The Contractor shall provide grout cube compressive strength, grout density, can grout volume results to the Engineer within 24 hours of testing.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Table 3 – Grout Material Acceptance Criteria

Quality Characteristic	Test Method	Engineering Limit
Minimum Compressive Strength:	AASHTO T 106 or AASHTO T 22	
3 days		≥ 2,500 psi
7 days		For information only
28 days		≥ 5,000 psi
Consistency	API RP-13B-1	± 10% of the density specified in the mix design
Volume		≥ Theoretical volume of hole

MassDOT Acceptance

The Engineer is responsible for performing all Acceptance activities and making the final Acceptance determination. The Engineer's Acceptance system will include monitoring the Contractor's QC activity, performing Acceptance inspection, and utilizing available sampling and testing data.

A. Inspection

The Engineer will perform Acceptance inspection of all work items to ensure that all materials and completed work are in conformance with the contract requirements.

B. Testing

MassDOT will determine whether it will test 2-inch cubes or 3-inch by 6-inch cylinders for its Acceptance testing. The Contractor will be required to provide to MassDOT a sufficient amount of approved 2-inch cube molds or 3-inch cylinders. If it is determined that MassDOT will test 3-inch cylinders then a correlation between the 2-inch cube results and the 3-inch cylinders shall be determined by MassDOT.

MassDOT will take the following sets of grout samples for Acceptance testing:

i. Verification Test Piles – 3 sets of cubes or cylinders for 3-, 7-, and 28-day strength testing.
ii. Proof Test Piles – three (3) sets of three (3) cubes or cylinders for 3-, 7-, and 28-day strength testing.
iii. Production Piles – one (1) set of three (3) cubes or cylinders for 28-day strength testing for every two (2) micropiles or one set from each grout plant on each day of operation; whichever occurs more frequently.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Pile verification or proof load testing shall not be performed until MassDOT has confirmed the grout has reached the minimum 3-day design strength specified in Table 4:

Table 4 – Grout Material Acceptance Criteria

Quality Characteristic	Test Method	Engineering Limit
Minimum Compressive Strength:	AASHTO T 106 or AASHTO T 22	
3 days		≥ 2,500 psi
7 days		For information only
28 days		≥ 5,000 psi

MICROPILE LOAD TESTING

A. General

The Contractor shall perform pre-production verification pile load testing in tension in accordance with ASTM D3689 on two sacrificial piles for Bridge No. S-24-016 and two sacrificial piles for Bridge No. S-24-026 during the first phase of construction. For Bridge No S-24-016, one verification load test shall be performed at the North Abutment on a pile with a rock socket length of 10 feet and another at the South Abutment with a rock socket length of 20 feet. For Bridge No. S-24-026, one verification load test shall be performed at the North or South Abutments on a pile with a rock socket length of 8 feet and another at the North Abutment Return Wall or South Abutment Return Wall with a rock socket length of 10 feet. For Bridge No. S-24-026, one verification load test shall be performed at the north side of the bridge (i.e. either North Abutment or North Abutment Return Wall) and one should be performed at the south side of the bridge (i.e. either South Abutment or South Abutment Return Wall). In general, the location of the verification test(s) shall be within 10 feet of the footprint of the proposed substructures, but at least 5 feet from any production pile as selected by the Contractor and accepted by the Engineer.

Pile proof load testing shall be performed on actual production micropiles and shall be performed on one pile per substructure unit or five percent of the total number of piles, whichever is greater, in conformance with the approved working drawings and testing procedures. The production proof test pile(s) shall be at a location selected by the Contractor and accepted by the Engineer.

ITEMS 945.10, 948.60, and 948.61 (Continued)

At a minimum, the following pile proof testing shall be performed for Bridge No. S-24-016 and Bridge No. S-24-026:

Summary of Micropile Proof Tests for Bridge No. S-24-016

Structure	Rock Socket Length	Number of Micropiles	Max. Axial Load (i.e. Factored Design Load)	Required Proof Test Load	Number of Micropiles being Proof Tested
North Abutment (West) - Phase 1	10 feet	18	115 kips [1]	125 kips	1
North Abutment (Final) - Phase 2	10 feet	34-18 = 16	125 kips	125 kips	1
South Abutment (West) - Phase 1	20 feet	11	296 kips	296 kips	1
South Abutment (Final) - Phase 2	20 feet	23-11 = 12	285 kips	285 kips	1
South Crash Wall	20 feet	9	285 kips	285 kips	1
North Crash Wall	10 feet	8	151 kips [2]	151 kips	1
North Return Wall #2	10 feet	4	150 kips [2]	151 kips	
Gravity Block (GB) #1	10 feet	5	150 kips	150 kips	1
Gravity Block (GB) #2	6 feet	8	80 kips	80 kips	1
Southeast Corner (Column Pile Cap)	11 feet	4	143 kips [3]	143 kips	1
Southeast Abutment (Single Pile)	11 feet	1	62.1 kips [3]	143 kips	

Notes:
[1] Micropiles for the North Abutment (West) - Phase 1 shall be installed and proof tested for a factored design load of 125 kips and a required proof test load of 125 kips based on the North Abutment (Final) – Phase 2 pile analysis.
[2] One (1) proof test shall be performed at the North Abutment Extension / Crash Wall or North Return Wall #2 based on a required proof test load of 151 kips.
[3] One (1) proof test shall be performed at the Southeast Corner(Column Pile Cap) / South Abutment (Single Pile) based on a required proof test load of 143 kips.

Summary of Micropile Proof Tests for Bridge No. S-24-026

Structure	Rock Socket Length	Number of Micropiles	Max. Axial Load (i.e. Factored Design Load)	Required Proof Test Load	Number of Micropiles being Proof Tested
North Abutment (West) - Phase 1	8 feet	18	105 kips [1]	105 kips	1
North Abutment (Final) - Phase 2	8 feet	34-18 = 16	105 kips	105 kips	1
South Abutment (West) - Phase 1	8 feet	18	105 kips [1]	105 kips	1
South Abutment (Final) - Phase 2	8 feet	34-18 = 16	105 kips	105 kips	1
South Crash Wall	8 feet	10	110 kips [2]	110 kips[2]	1 [2]
South Return Wall #4	10 feet	4	140 kips [2]	140 kips[2]	
North Crash Wall	8 feet	10	110 kips [2]	110 kips[2]	1 [2]
North Return Wall #3	10 feet	4	140 kips [2]	140 kips[2]	
Gravity Block (GB) #3	10 feet	5	135 kips	135 kips	1
Gravity Block (GB) #4	7 feet	7	100 kips	100 kips	1

Notes:
[1] Micropiles for the North and South Abutments (West) - Phase 1 shall be installed and proof tested for a factored design load of 105 kips and a required proof test load of 105 kips based on the North Abutment and South Abutment (Final) – Phase 2 pile analyses.
[2] Two (2) proof tests shall be required, one to 110 kips and one to 140 kips. Either one (1) proof test at the South Crash Wall and one (1) proof test at the North Return Wall #3; or one (1) proof test at the North Crash Wall and one (1) proof test at the South Return Wall #4.

ITEMS 945.10, 948.60, and 948.61 (Continued)

The load tests shall conform to the requirements of ASTM D1143 (vertical compression load testing) or ASTM D3689 (vertical tension load testing) except as modified herein. The maximum test loads shall be 150% of the Factored Design Load (FDL) for the micropile verification test and 100% of the FDL for Micropile Proof Test. The Factored Design Load is defined as the Factored Axial Design Load (compression and/or tension) as shown on the Plans. The maximum test loads shall be as specified above but not more than 80% of the structural capacity of the micropile elements, to include steel yield in tension, steel yield or buckling in compression, or grout crushing in compression. The structural elements of the verification test micropile may be modified for testing the FDL of the micropile as accepted by the Engineer. The Alignment Load (AL) should not be more than 0.04 FDL.

Before starting the work, the Contractor shall submit to the Engineer for acceptance, a pile load test plan including a written description of the equipment and methods which are intended to be used. The methods must be of an accepted type and shall be altered as necessary to meet the acceptance of the Engineer. The pile load test plan and description shall be prepared and stamped by a professional engineer registered in the Commonwealth of Massachusetts.

Grout within the micropile verification test pile shall attain the minimum required 3-day compressive strength prior to load testing. The top elevation of the test pile shall be determined immediately before the load testing. The head of each micropile shall be cut-off level or capped to produce a level horizontal bearing surface.

The Contractor shall provide all personnel and equipment needed to perform the test, measure loads and movements, and record test data. A representative of the Department or the Engineer may observe and witness the test and record data independently. No testing is to be performed unless all the agreed representatives are present.

Testing equipment shall include dial gauges, dial gauge support, jack and pressure gauge, electronic load cell, and a reaction frame. The Contractor shall provide a description of test setup and jack, pressure gauge and load cell calibration curves in accordance with the submittals Section.

Design the testing reaction frame to be sufficiently rigid and of adequate dimensions such that excessive deformation of the testing equipment does not occur. Provide a reaction frame capable of safely supporting 125 percent of the maximum test load. Align the jack, bearing plates and stressing anchorage such that unloading and repositioning of the equipment will not be required during the test.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Apply and measure the test load with a hydraulic jack and pressure gauge. The pressure gauge shall be graduated in 100 psi increments or less. The jack pressure gauge shall have a pressure range not exceeding twice the anticipated maximum test pressure. The jack shall be positioned at the beginning of the test such that unloading and repositioning during the test will not be required.

Calibrate the test load jacking system including the hydraulic jack couplings, gas pump, pressure gauge, and hydraulic load cell prior to the test so that the load applied is controlled to within 3 percent of the total applied load. Submit calibration reports prior to the start of the pile load test. Monitor the creep test load hold during verification tests with both the pressure gauge and the electronic load cell. Use the load cell to accurately maintain a constant load hold during the creep test load hold increment of the verification test.

Readings of settlement and rebound shall be referred to a fixed benchmark and shall be made using at least three dial gauges (micrometer dial extensometers) graduated to 0.001 inches and located 120 degree intervals around the micropile. The gauges shall be mounted on a reference beam supported at each end by reliable supports located at least 10 feet from the center of the test pile and independent from the jack, pile, or reaction frame.

The dial gauges shall have a travel sufficient to allow the test to be done without having to reset the gauges. Visually align the gauges to be parallel with the axis of the micropile. Readings shall be taken at intervals specified in the Verification Test and Proof Test section.

The Contractor shall establish a survey reference point on the test pile and another reference point at the center of the reference beam. The reference points shall consist of graduated scales machine-divided into 0.02 inch and attached securely to the pile and reference beam. The reference points shall be monitored using survey equipment during the pile load test.

Protect the settlement measuring system against rain, wind, frost, and any other disturbances that could affect the reliability of the settlement observations. Provide sun shading for the measuring system for the duration of the test and for a minimum of 1 hour prior to the start of the test.

B. Micropile Verification Test

The Contractor shall perform pre-production verification pile load testing on sacrificial piles at a location selected by the Contractor and accepted by the Engineer. The location of the verification tests shall be within 10 feet of footprint of a substructure unit but at least 5 feet away from any production pile. Testing shall be performed in compression or tension in accordance with ASTM D1143 or ASTM D3689, respectively, except as modified herein.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Verification load tests shall be performed to verify that the Contractor installed micropiles will meet the required FDL and load test acceptance criteria and to verify that the length of the micropile bond zone is adequate. The drilling-and-grouting method and casing outside diameter shall be identical to those specified for the production piles as indicated on the Plans. The inner 6.625-inch diameter casing can be omitted at the verification test pile at the South Abutment of Bridge No. S-24-016.

Verification test piles shall be installed at the location accepted by the Engineer. The steel core may need to have a higher strength or a larger diameter than for the production piles to accommodate the test load.

Verification test piles shall include at least two, ¾-inch diameter PVC Schedule 40 pipes cast into the test pile to allow telltales to be installed for load testing. The pipes shall be securely fastened in straight alignment to prevent displacement during grouting. The pipes shall be sealed at the bottom with threaded steel caps and at the top with threaded PVC plugs. The pipes shall extend within one foot of the top and bottom of the bearing stratum (i.e. unbonded zone of the pile) at the test pile location. Strain gages may be substituted for telltales.

The micropile verification load test results must verify the micropile design and installation methods, and be reviewed and accepted by the Engineer prior to beginning installation of production micropiles. The verification test pile and reaction piles shall not be used as production piles.

Test verification pile to a maximum Test Load of 150% of the Factored Design Load (FDL) defined above, as indicated on the Plans. The verification pile load test shall be made by incrementally loading the micropile in accordance with the following cyclic load schedule:

Step	Loading	Applied Load	Hold Time (min.)
1	Cycle 1	AL	-
		0.075 FDL	4
		0.15 FDL	4
		0.225 FDL	4
		0.30 FDL	4
		0.375 FDL	4
2	Cycle 2	AL	1
		0.15 FDL	1
		0.30 FDL	1
		0.375 FDL	1
		0.45 FDL	4
		0.525 FDL	4
		0.60 FDL	4
		0.675 FDL	4
		0.75 FDL	4

ITEMS 945.10, 948.60, and 948.61 (Continued)

3	Cycle 3	AL	1
		0.30 FDL	1
		0.60 FDL	1
		0.675 FDL	1
		0.75 FDL	1
		0.875 FDL	4
		0.90 FDL	4
		0.975 FDL	10 or 60 (Creep Test)
4	Cycle 4	AL	1
		0.30 FDL	1
		0.60 FDL	1
		0.90 FDL	1
		0.975 FDL	1
		1.05 FDL	4
		1.125 FDL	4
		1.20 FDL	4
		1.275 FDL	4
		1.35 FDL	4
		1.425 FDL	4
		1.50 FDL	4
		1.20 FDL	4
		0.90 FDL	4
		0.60 FDL	4
		0.30 FDL	4
		AL	15

Creep Test: Pile top movement shall be measured at each load increment. The load-hold period shall start as soon as each test load increment is applied. The verification test pile shall be monitored for creep at the 0.975 FDL. Depending on performance, either a 10 minute or 60 minute creep test shall be performed at the 0.975 FDL test load where movements shall be recorded at 1, 2, 3, 5, 6, and 10 minutes. When the pile top movement between 1 and 10 minutes exceeds 0.04 inches, the 0.975 FDL test load shall be maintained an additional 50 minutes. Movements shall be recorded at 20, 30, 50, and 60 minutes. Dial gauges shall be reset to zero after the initial AL is applied.

ITEMS 945.10, 948.60, and 948.61 (Continued)

The Acceptance criteria for micropile verification load tests are:

1. If the pile is tested in compression, acceptance will be based on the Davisson criteria. For this criterion, the ultimate load is defined as the load at which settlement measured relative to the top of the pile prior to the start of testing exceeds the sum of:
    I. The theoretical elastic compression of the pile assuming the load applied at the top of the pile act over the full length of the pile, and
    II. 0.15 inches plus 1 percent of the pile tip diameter.

2. If the pile is tested in tension, the ultimate load is defined as the load that produces an upward movement under load of 0.5 inch at the pile tip. The movement at the pile tip is:
    I. Measured directly by tell-tale, or
    II. Computed by deducting the theoretical elastic elongation of the pile from the upward movement measured relative to the top of the pile prior to the start of testing.

3. At the end of the 0.975 FDL increment, the test pile shall have a creep rate not exceeding 0.04 inch/log cycle time (1 to 10 minutes) or 0.08 inch/log cycle time (6 to 60 minutes or the last log cycle if held longer). The creep rate shall be linear or decreasing throughout the creep load hold period.

4. Failure does not occur at any load increment up to and including the maximum test load, 1.50 FDL. Failure is defined as load where the slope of the load versus head settlement curve first exceeds 0.025 in/kip.

At the completion of verification testing, it is recommended to remove the portion of sacrificial micropiles that are within 10 feet of the proposed roadway grade or at least 18 inches below the bottom of proposed structures at the sacrificial micropile location, whichever is lower.

For the verification load tests, reports must be written and submitted to the Engineer within 3 working days of the load test completion. This report will either confirm the micropiles' resistance and bond lengths specified on the plans or reject the piles based upon the test results. This report shall be reviewed and acceptance by the Engineer prior to beginning installation of production micropiles. The contents of the verification load test report shall include:

1. Brief project description.

2. Description of site and subsurface conditions including information on the ground conditions at the location of the load test and a comparison to actual conditions encountered.

3. Key personnel including the drill rig operator, the superintendent, the grout plant operator, and any other personnel involved in the installation and testing of the micropile.

ITEMS 945.10, 948.60, and 948.61 (Continued)

4. Micropile installation data including information such as length of the micropile (cased and uncased), number of bags of cement used to construct the micropile, size and type of casing and reinforcement, geology encountered (e.g. soil material, rock material, and water levels) during drilling, grouting record and grout testing results.

5. Results of load test including load-movement curves/figures and filled-out data sheets.

6. Statement of load test requirements and acceptance criteria.

7. Comparison of load test requirements and acceptance criteria.

8. Summary statement on the load test results.

If a tested micropile fails to meet the Acceptance criteria, the Contractor shall modify the design, the construction procedure, or both. These modifications may include but not limited to modifying the installation methods, increasing the bond length, regrouting the pile via preplaced regrout tubes or changing the micropile type. Any modification that necessitates changes to the structure design shall be submitted as a revision to the Working Drawings and require the Engineer's review and acceptance. Additional load testing may be required until an acceptable pile load test meets the designated load test requirements.

C. Micropile Proof Test

Proof test piles to a maximum test load of 1.00 FDL as defined above. Proof tests shall be made by incrementally loading the micropile in accordance with the following cyclic load schedule:

Step	Loading	Applied Load	Hold Time (min.)
1	Cycle 1	AL	-
		0.10 FDL	4
		0.20 FDL	4
		0.30 FDL	4
		0.40 FDL	4
		0.50 FDL	4
		0.60 FDL	4
		0.70 FDL	4
		0.80FDL	4
		0.90 FDL	4
		1.00 FDL	10 or 60 (Creep Test)
		0.75 FDL	4
		0.50 FDL	4
		0.25 FDL	4
		AL	4

ITEMS 945.10, 948.60, and 948.61 (Continued)

Creep Test: Pile top movement shall be measured at each load increment. The load-hold period shall start as soon as each test load increment is applied. The proof test pile shall be monitored for creep at the 1.00 FDL. Depending on performance, either a 10 minute or 60 minute creep test shall be performed at the 1.00 FDL test load where movements shall be recorded at 1, 2, 3, 5, 6, and 10 minutes. When the pile top movement between 1 and 10 minutes exceeds 0.04 inches, the 1.00 FDL test load shall be maintained an additional 50 minutes. Movements shall be recorded at 20, 30, 50, and 60 minutes. Dial gauges shall be reset to zero after the initial AL is applied.

The Acceptance criteria for Micropile Proof Load Test are the same as those for the Micropile Verification Load Test, except as modified below:

1. The creep test shall be held at the end of the 1.00 FDL increment.

2. Failure does not occur at any load increment up to and including the maximum test load, 1.00 FDL

Within 3 days of the completion of each proof load, the Contractor shall submit a report confirming the micropiles' capacities and bond lengths specified on the plans or reject the piles based upon the test results. The contents of the proof load test report shall be the same as those in the report for the Micropile Verification Load Test.

If a proof-tested micropile fails to meet the Acceptance criteria, the Contractor shall immediately proof test another micropile within that substructure. For failed piles and further construction of other piles, the Contractor shall modify the construction procedure. Failed micropiles shall be replaced at the Contractor's expense. Any modification that necessitates changes to the structure design shall require the Engineer's prior review and acceptance. Verification and proof tests will be re-performed if the micropile type is changed.

NON-CONFORMING PILES

Non-conforming piles include piles that are installed out of tolerance, are damaged, the volume of grout placed is less than the theoretical volume of the hole, or the grout tests do not indicate the specified strength has been achieved. The Contractor shall submit a written remedial action plan to the Engineer for approval. The remedial action plan shall indicate how to correct the problem and prevent its reoccurrence. To mitigate or remediate non-conforming piles, the Contractor may be required to provide additional piles or supplement piles to meet specified requirements at no additional cost to the Owner.

ITEMS 945.10, 948.60, and 948.61 (Continued)

RAILROAD CONSIDERATIONS

Some proposed micropile locations are located adjacent to the CSX railroad tracks. The Contractor is required to coordinate all work with CSX. The Contractor shall be prepared to perform the work under this item in limited work windows with an assumed drilling inefficiency due to the need for numerous mobilizations and demobilizations of the drill rig set up.

The Contractor shall submit procedures for setup and securement of equipment such as drill rigs and cranes with potential to foul tracks that will include predefined precautions such as including swing-limiting controls, oversizing matting and dunnage for supporting equipment, etc.

The Contractor shall protect adjacent CSX Railroad tracks from damage associated with micropile construction and other related operations. Damage due to micropile installation or other construction activities shall be repaired immediately by the Contractor at its own expense.

METHOD OF MEASUREMENT

Item 945.10 will be measured for payment by the Foot of drilled micropiles installed, complete in place and accepted.

Items 948.60 and 948.61 will be measured for payment per Each Micropile Verification Load Test and Micropile Proof Load Test respectively.

BASIS OF PAYMENT

Item 945.10 will be paid for at the contract unit price per Foot, which price shall include all materials, labor, equipment, proper disposal of drilling spoil, and incidental costs required to complete the work.

There will be no separate payment for mobilization and demobilization associated with this item.

Any difference in the required length of permanent casing and micropile installed and accepted by the Engineer from the estimated lengths shall be measured for payment and/or credit. There will be no payment for differences in required length of temporary casing. The Micropile Contractor is also responsible for estimating the grout take. There will be no extra payment for grout overruns.

The Contractor shall anticipate encountering obstructions as noted herein and shall utilize equipment and methods necessary to advance through or remove the obstructions. The presence of obstructions, any lost production, replacement piles, and the removal of obstructions, if necessary, shall not be measured or paid for separately. Any costs associated with the presence of obstructions shall be considered incidental to the Drilled Micropiles Item.

ITEMS 945.10, 948.60, and 948.61 (Continued)

Drilling tools that are lost during the drilling shall not be considered obstructions and shall be promptly removed by the Contractor without compensation. If removal will degrade the hole, the hole shall be abandoned with a new hole located by the Engineer. All costs due to lost tool removal, drilling a new hole and filling the abandoned hole shall be borne by the Contractor.

Items 948.60 and 948.61 will be paid at the contract unit price per each completed and accepted test, for which payment shall be considered complete compensation for providing all design, materials, labor, equipment, load test report, and incidentals to complete the work including the installation and materials of the test pile and reaction piles, if used. This payment shall also include full compensation for cutting the pile to the elevation necessary to properly incorporate the pile in the structure. If a pile is not to be incorporate in the structure, this payment item includes cutting the pile to the grade necessary to avoid its interference with the proposed construction. Payment for Micropile Verification Load Tests shall also include full compensation for installing the test pile. Micropiles installed as test piles for Proof Load Tests, if incorporated in the final structures, the length of pile installed in place shall be paid for at contract unit price of Drilled Micropiles.

ITEM 951.1 GRANITE CORING FOOT
ITEM 951.2 STEEL SLEEVE/ CONCRETE CORING FOOT

The work under these items shall conform to the relevant provisions of Subsections 901, 940, and 960 of the Standard Specifications, Item 945.10 and the following:

The work under Item 951.1 shall consist of drilling holes through existing granite block.

The work under Item 951.2 shall consist of drilling holes and installing a steel sleeve through a concrete footing. This work is required to support the micropile installation at locations shown on the drawings. Micropile installation, including but not limited to micropile steel casing and grout, is not included in this Item and is covered under Item 945.10.

Any variations in the diameter of the hole or the method of drilling the hole is subject to the approval of the Engineer.

CONSTRUCTION METHODS

The diameter and length of the required holes shown on the drawings. All holes shall be diamond core drilled. The inner surfaces of diamond core drilled dowel holes shall be scored to develop sufficient keying action. The method of scoring of the hole's inner surfaces shall be subject to the approval of the Engineer. The holes shall be blown clear of any debris and shall have the approval of the Engineer prior to the placement of any grout material.

The drilling operation shall be performed without damage to any existing portion of the structure that is to remain in place. Any damage to the existing structure that is to remain in place shall be repaired to a condition equal to or better than that existing prior to the beginning of the Contractor's operations and shall be repaired at their expense.

The Contractor shall have no claim for any variations in the diameter of the hole or the method of drilling the hole.

METHOD OF MEASUREMENT

Items 951.1 and 951.2 will be measured for payment by the Foot of hole drilled, complete in place.

BASIS OF PAYMENT

Items 951.1 and 951.2 will be paid at the respective contract unit price per Foot, which price shall include all materials, labor, equipment, proper disposal of drilling spoil, and incidental costs required to complete the work.

There will be no separate measurement for mobilization and demobilization associated with this item. Any difference in the required length of coring and accepted by the Engineer from the estimated lengths shall be measured for payment and/or credit.

ITEM 953.31 TEMPORARY EXCAVATION SUPPORT SYSTEM LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsections 140 and 950 of the Standard Specifications and the following:

Temporary earth support may be required for excavation protection to accompish staged construction, depending on the Contractor's means and methods. All temporary earth support systems shall be removed and areas disturbed by construction shall be restored to their previous condition. All materials used for the temporary earth support system shall remain the property of the Contractor.

The work under this item shall include designing, furnishing, bracing, installing, maintaining, operating, dewatering and removing a temporary earth support system as required. The Contractor shall coordinate the Temporary Earth Support System with existing utilities, railroad and adjacent structures.

All materials used, whether new or used, shall be sound and free from strength impairing defects.

The Contractor shall submit drawings and calculations for the proposed excavation support system to the Engineer for approval, stamped by a Professional Structural Engineer licensed in the Commonwealth of Massachusetts. The excavation support system shall be designed according to the following criteria:

1. The braced excavation system shall be designed to resist surcharge live load of at least HL-93 truck loading.

2. The Contractor shall make their own evaluation of existing conditions and facilities, and of the effects of the proposed braced excavation system and construction methods, and shall provide in their design for all loads and methods necessary to permit construction of the proposed superstructure while maintaining public safety, protecting existing structures, and protecting third party property from damage caused by their operations.

3. No element of the support system shall be spliced unless approved by the Engineer.

4. The Contractor shall furnish the manufacturer's sworn statement, in lieu of mill inspection, for the material furnished and in full accordance with Section 6.00.

5. The Contractor shall submit a slope stability analysis to the Geotechnical Section for approval prior to start of any work that is affected by the analysis.

6. The Contractor shall submit all temporary excavation support designs to the Geotechnical Section for approval prior to start of any work that is affected by the design.

ITEM 953.31 (Continued)

The Contractor shall accurately locate all utility lines, underground battered piles and structures to ensure that the proposed braced excavation system will not interfere with them.

The Engineer's approval of the braced excavation system will be general in character and shall not relieve the Contractor from the responsibility for the adequacy of the design, materials and workmanship to safely support the excavation.

Construction monitoring is required for the temporary earth support system and shall be incidental to this item. Construction monitoring shall include, but not be limited to, vibration monitoring and vertical and lateral movements of the temporary earth support system, existing bridges, retaining walls and utilities

BASIS OF PAYMENT

Item 953.31 will be paid at the Contract Bid Price Lump Sum, which price shall include all design, labor, material, equipment, tools, and incidental costs required to complete the work.

The schedule of payments shall be as follows:

- 50% of the bid price will be paid after complete installation of the System.
- 50% of the bid price will be paid after complete removal and disposal of the System off the project.

ITEM 992.33	**TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 1**	**LUMP SUM**
ITEM 992.34	**TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 2**	**LUMP SUM**
ITEM 992.35	**TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 3**	**LUMP SUM**
ITEM 992.36	**TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 4**	**LUMP SUM**

The work under these Items shall conform to the relevant provisions of Subsections 140 and 950 of the Standard Specifications and the following:

This work consists of design, construction and removal of temporary utility supports that will enable staged construction of Bridge Nos. S-24-016 and S-24-026 while maintaining existing and proposed utility infrastructure in place prior to completion of the permanent utility supports.

System 1 shall be constructed to temporarily support the existing Eversource Electric duct bank prior to the complete removal of the existing westerly section of Bridge No. S-24-016. To avoid impacting rail operations the System shall be constructed with its lowest elements no lower than the lowest members of the existing bridge.

System 2 shall be constructed prior to initiating Stage 2 demolition of Bridge No. S-24-016 to support the proposed Eversource Electric conduits after the existing duct bank is removed, but before the permanent supports can be installed. To avoid impacting rail operations the System shall be constructed with its lowest elements no lower than the lowest members of the new bridge.

System 3 shall be constructed to temporarily support existing and proposed utilities as needed through all stages of construction at Bridge No. S-24-026, including all shifts required to install the micropiles. The System may occupy any part of the area under the bridge.

System 4 shall be constructed to temporarily support existing and proposed telecommunication conduits as noted on the plans on the easterly side of Bridge No. S-24-016, and includes all temporary shifts to enable installation of the micropiles. To avoid impacting rail operations the System shall be constructed with its lowest elements no lower than the lowest members of the existing bridge.

All Systems shall be constructed to maintain the existing utilities undisturbed in place, support and maintain interim utility arrangements required for micropile installations, and final configurations until permanent supports are provided. The Systems shall be constructed to enable the permanent utility supports to be installed and the temporary Systems to be removed without disturbing the existing utilities. The Contractor is responsible for furnishing all materials, equipment, labor, services, and supervision, and for selecting means and methods for the installations. The Systems shall be submitted for review and approval by the Engineer and the affected utility companies. The Contractor shall coordinate all work with the utility companies and the City of Springfield.

ITEMS 992.33 through 992.36 (Continued)

The Contractor shall design the temporary supports for utilities and their foundations to withstand all loads that the temporary supports shall withstand during construction. Design of the temporary supports and their foundations shall be stamped by a Licensed Engineer registered in the Commonwealth of Massachusetts, and submitted to the Engineer for approval.

The Systems shall not obstruct any other work of the contract nor shall their components be used for any other purpose other than for utility support.

No additional compensation will be made for the repositioning of temporary supports or additional temporary support materials to complete the shifts of utilities that are need to install the micropiles. The Contractor shall account for this work in his bid price under the respective lump sum items.

BASIS OF PAYMENT

Items 992.33, 992.34, 992.35, and 992.36 will be paid for at the respective lump sum price bid, which prices shall include all labor, materials, equipment, and incidental costs required to complete the work.

The schedule of payments shall be as follows:

- 80% of the bid price will be paid after complete installation of the respective System.
- 20% of the bid price will be paid after complete removal and disposal of the respective System off the project.

ITEM 994.1 TEMPORARY PROTECTIVE SHIELDING SQUARE FOOT

The work done under this Item consists of designing, furnishing, installing, maintaining, removing and disposing of a protective shielding system on, adjacent to and under Bridge No. S-24-016. The shielding shall protect CSX ROW from falling or flying debris, tools or incidental items during demolition and construction of the bridge. Shielding is required for all work over CSX ROW.

Work platforms, containment systems and debris shields for demolition and construction activities other than superstructure demolition are not included under this Temporary Protective Shielding item and shall be considered incidental to the work unless specifically stated otherwise within the contract documents.

The Contractor shall anticipate delays and inefficiencies resulting from working in and around the CSX railroad. Any lost production resulting from coordination with the railroads shall not be measured or paid for separately.

The Contractor submit procedures for setup and securement of equipment such as drill rigs and cranes with potential to foul tracks that will include predefined precautions such as including swing-limiting controls, oversizing matting and dunnage for supporting equipment, etc.

The Contractor shall protect adjacent CSX Railroad tracks from damage associated with micropile construction and other related operations. Damage due to micropile installation or other construction activities shall be repaired immediately by the Contractor at its own expense.

The Contractor shall submit calculations and detailed drawings of the proposed shielding, stamped by a professional engineer registered in the Commonwealth of Massachusetts, to the Engineer for review and approval. Acceptance of the shielding design by the Engineer is required prior to installation of the shielding system.

All materials used to construct the temporary protective shielding shall be new.

All materials used in the shielding system shall become the property of the Contractor and shall be removed from the site at the completion of the Project.

The shielding shall conform to the following:

1. Shielding shall be in place prior to the start of any demolition or removal to prevent any debris from falling onto the CSX ROW.
2. Shielding shall extend the full length of the bridge and a sufficient distance above and beyond the deck overhang at the fascias to protect the CSX tracks below.
3. Shielding shall have all spaces along the perimeter and at the seams sealed to prevent dust and debris from escaping and falling onto the CSX tracks below.
4. Vertical shielding shall be required if the means and methods of demolition presents the risk of debris falling onto the CSX tracks below.

ITEM 994.1 (Continued)

5. Shielding shall be designed to safely withstand all loads that it will be subjected to but not less than 100 pounds per square foot; to be stiff enough to limit deflection to ½ inch under maximum loads; and to be tightly sealed at all joints. The allowable design stresses shall be in accordance with AASHTO Standard Specifications for Highway Bridges. The Contractor shall be responsible for developing the loads to which the shielding is anticipated to be subject to based on the Contractor's means and methods of construction. The design shall also include a complete description of the equipment and construction methods proposed for the superstructure removal and also the maximum superstructure segment being removed in one section.
6. The shielding shall be designed to withstand impact of the maximum superstructure segment or member should it fall during demolition or removal.
7. The Design of the shielding shall also include a complete description of the equipment and construction methods proposed for the superstructure demolition, including deck removal and the maximum size of debris anticipated during excavation of the deck area (i.e. 1 ft. x 1 ft. hammered sections or 2 ft. x 4 ft. wet sawcut sections). Shielding beneath areas to be excavated or beneath the path used to remove demolition debris shall be designed to withstand the maximum size of debris that could fall during excavation or removal.
8. Shielding shall be installed and removed only upon approval of the Engineer.
9. Shielding design shall maintain a minimum of 21'-9" vertical clearance above the CSX top of rail. The shielding shall not decrease the minimum vertical or horizontal bridge clearance to the railroad tracks unless otherwise approved by the Engineer

No debris shall be swung over traffic adjacent to the bridge.

If the Contractor's operations damage any existing portions of the bridges that have been designated to be retained in the proposed construction, such damage shall be repaired at the Contractor's expense.

The Contractor may utilize the bottom flanges of the existing steel beams and of the proposed steel beams as supports for the temporary protective shielding where feasible. However, the Contractor will not be permitted to weld onto, drill into, or cut any existing or proposed structural members without receiving approval of the Engineer.

For any proposed shielding systems that include installation of brackets along the lengths of the substructure units, the Contractor may drill and anchor into the existing substructure units as approved by the Engineer. However, the Contractor will not be permitted to drill into any proposed concrete. Inserts for anchors into proposed concrete must be installed prior to concrete placement. Once the anchors are removed, all inserts must be filled in accordance with the contract documents.

ITEM 994.1 (Continued)

SUBMITTALS

A minimum of thirty (30) days prior to the start of any demolition and/or erection, the Contractor shall submit for review and approval a detailed temporary protective shield plan which shall include, but not be limited to, a description of demolition and erection equipment, methods of operation, locations and sequence of sections to be removed, as well as data relative to the protective shield. The plan shall also indicate the type, size and dimensions of the materials to be used for the protective shield and the proposed methods for installation of the protective shield including connections, fasteners, erection procedures and maintenance in accordance with the information provided in this specification.

CONSTRUCTION METHODS

Special care shall be taken to avoid damage to any existing bridge components schedule to remain. Any damage due to the Contractor's operations shall be repaired or replaced to the satisfaction of the Engineer at no additional cost to the Department.

The Contractor shall note that utilities are located on some of the bridge structure. The Contractor shall determine the exact location of the utilities and their impact upon the Contractor's work. Plans showing the approximate location of the utilities are included in contract documents. The use of shielding to protect these utilities shall be incidental to this Item. Any costs incurred to the existing utilities which are caused by the Contractor's operations or negligence, shall be the responsibility of the Contractor, and shall be repaired or replaced at no additional costs to the Department.

The Contractor shall periodically remove all accumulations of concrete and/or debris on the protective shielding so as not to exceed the design loads in the assumptions used for the design of the temporary protective shielding, or as required by the Department.

Any control of traffic necessary to perform this work shall be incidental to the work performed under this Item.

METHOD OF MEASUREMENT

Item 994.1 will be measured for payment by the Square Foot of shielding installed, maintained, and removed upon completion of repair work as required by the Engineer.

BASIS OF PAYMENT

Item 994.1 will be paid for at the Contract unit price per Square Foot, which price shall include all labor, materials, equipment, design, submittals, removal and disposal all debris, shielding installation, maintenance, final removal, and all incidental costs required to complete the work.

For Temporary Protective Shielding constructed in stages, any overlaps in area with a previous stage will not be measured for payment. The total pay limit for shielding at each bridge shall equal the limit of superstructure removal shown on the plans for each respective bridge.

ITEM 995.01 BRIDGE STRUCTURE, BRIDGE NO. S-24-016 LUMP SUM
ITEM 995.02 BRIDGE STRUCTURE, BRIDGE NO. S-24-026 LUMP SUM

The work under these Items shall conform to the relevant provisions of Subsection 995 of the Standard Specifications and the specific requirements stipulated below for the component parts of these Items. For those component parts where no specific requirement is stipulated, the Standard Specifications shall apply except for payment.

Work under these items shall include all materials, equipment and labor needed to construct the following:

- Concrete pile caps, keeper blocks, backwalls and curtain walls
- Approach slabs
- Steel reinforced elastomeric bearings
- Steel girders, diaphragms and utility supports
- Concrete deck slab and end diaphragms
- Protective screen
- Membrane Waterproofing
- Sidewalk, shared use path and safety curbs
- Abutment column and pile cap

Concrete abutment extensions / crashwalls and wingwalls / return walls shall be paid for separately, and are not included in this Lump Sum.

The Contractor shall submit procedures for setup and securement of equipment such as drill rigs and cranes with potential to foul tracks that will include predefined precautions such as including swing-limiting controls, oversizing matting and dunnage for supporting equipment, etc.

All work under these items shall be in accordance with the schedule of items included herein under Basis for Partial Payments and all other items that are part of the work for which payment is not provided for elsewhere.

The work does not include any items listed separately in the proposal. Payment for materials shown on the Plans as being part of this bridge structure or which may be incidental to its construction and are not specifically included for payment under another Item shall be considered incidental to the work performed under these items and shall be included in the unit price of the component of which they are a part.

ITEMS 995.01 and 995.02 (Continued)

The following Special Provisions shall apply to subitems included under Items 995.01 and 995.02:

SAWING AND SEALING JOINTS IN ASPHALT PAVEMENT AT BRIDGES

The work to be done under this heading consists of making a sealed kerf across the full width of the finished asphalt pavement at bridge abutments where called for on the Plans. The shape, width, and depth of the kerf shall be as shown on the Plans.

Prior to the start of the asphalt pavement operation, the Contractor shall place a mark on each curb or barrier on either side of the paved roadway. These marks shall be aligned with the actual end of the bridge deck and shall be placed so that they will not be covered or otherwise obscured by the asphalt pavement.

After the completion of the paving operation, the Contractor shall snap a straight chalk line on the pavement between these two marks. The Contractor shall then saw cut the pavement along this line to the depth, width and shape as shown on the Plans. The equipment shall be approved by the Engineer prior to commencing work.

After completing the saw cutting, the Contractor shall clean the saw groove of any dust and debris with an oil free air blast. If the groove was wet sawn, the groove shall be cleaned with a water blast to remove any remaining slurry and debris, vacuumed with a Wet-or-Dry vacuum to remove any standing water, and then dried with an air blast from a Hot-Air-Lance.

Once the groove is clean and dry, the Contractor shall fill it completely with a hot-applied bituminous crack sealer meeting the requirements of M3.05.4 in accordance with the manufacturer's application instructions and restrictions regarding ambient and material temperatures. The crack sealer shall be thoroughly cured prior to opening the road to traffic. To reduce tackiness, only boiler slag aggregate (black beauty) shall be scattered over the sealer when required by the Engineer. Conventional sand shall not be used for this purpose.

ITEMS 995.01 and 995.02 (Continued)

5000 PSI, 3/4 IN, 685 HP CEMENT CONCRETE

The work under this heading shall conform to the applicable provisions of Subsection 901 and Subsection M4.06.1 of the Standard Specifications and the following:

All structural concrete is to be placed in the dry.

The work under this heading does not include any items listed separately. Paraffin joints, PVC pipe, utility sleeves, crushed stone, form liners, threaded inserts, miscellaneous steel, styrofoam, mechanical couplers, preformed fillers, joint sealers, water stops, expansion joints, and construction joints shall be considered as incidental to the work involved in the furnishing and placing of concrete.

5000 PSI, 3/4 IN, 685 HP Cement Concrete shall be used to construct all concrete work, including cast-in-place deck slab, end diaphragms, abutment pile caps, backwalls, curtain walls and keeper blocks, abutment column and column footing (pile cap), approach slabs, stem walls at the gravity block/crash walls/return walls and retaining wall footings, CP-PL2 barriers, shared-use-path moment slab and sidewalk moment slab, highway guardrail transitions and at those areas as designated by the Engineer, and/or areas designated on the Plans.

The material shall be listed on the Qualified Construction Materials List (QCML) and installed in accordance with the manufacturer's requirements based on the application and depth required.

SHEAR CONNECTORS

Shear Connectors shall conform to the relevant provisions of Subsection 960 and Subsection M8.04.1 of the Standard Specifications.

STRUCTURAL STEEL

The work under this heading shall conform to the relevant provisions of Subsection 960 of the Standard Specifications and the following:

Structural steel shall be coated AASHTO M 270 Grade 50W.

PROTECTIVE SCREEN TYPE II
PROTECTIVE SCREEN TYPE I EXTENSION

Protective Screen Type I Extension is the curved addition to the Type II protective screen where specified over the RR. In locations where the Type I extension is indicated attached to the Type II, both items will be measured separately.

ITEMS 995.01 and 995.02 (Continued)

SCHEDULE OF BASIS FOR PARTIAL PAYMENT

Within ten (10) days after the Notice to Proceed, the Contractor shall submit, in duplicate, for the approval of the Engineer, a schedule of unit prices for the major components of the bridge structures as listed below. The bridge structure Lump Sum breakdown quantities provided below are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual bridge components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 995.01 and Item 995.02 and no further compensation will be allowed.

SCHEDULE FOR ITEM 995.01					
Sub-Item	Description	Quantity	Unit	Unit Price	Total
482.31	Sawing and Sealing Joints in Asphalt Pavement at Bridges	135	FT		
904.3	5000 PSI, 3/4 INCH, 685 HP Cement Concrete	498	CY		
910.	Steel Reinforcement for Structures	12,170	LB		
910.2	Steel Reinforcement for Structures - Coated	92,265	LB		
911.1*	Shear Connectors	4,470	EA		
922.	Laminated Elastomeric Bearing Pad without Anchor Bolts	27	EA		
960.	Structural Steel	506,836	LB		
965.	Membrane Waterproofing for Bridge Decks	7,675	SF		
970.	Damp-Proofing	2,039	SF		
975.4	Protective Screen Type II	238	FT		
975.41*	Protective Screen Type I Extension	238	FT		
Total Cost for Item 995.01 =					

ITEMS 995.01 and 995.02 (Continued)

SCHEDULE FOR ITEM 995.02					
Sub-Item	Description	Quantity	Unit	Unit Price	Total
482.31	Sawing and Sealing Joints in Asphalt Pavement at Bridges	135	FT		
904.3	5000 PSI, 3/4 INCH, 685 HP Cement Concrete	433	CY		
910	Steel Reinforcement for Structures	12,215	LB		
910.2	Steel Reinforcement for Structures - Coated	85,680	LB		
911.1*	Shear Connectors	3,600	EA		
922.	Laminated Elastomeric Bearing Pad without Anchor Bolts	24	EA		
960.	Structural Steel	290,248	LB		
965.	Membrane Waterproofing for Bridge Decks	6,206	SF		
970.	Damp-Proofing	1,961	SF		
975.4	Protective Screen Type II	203	FT		
Total Cost for Item 995.02 =					

The schedules above apply only to Bridge Structure No. S-24-016 and S-24-026. Payment for similar materials and construction at locations other than at these bridge structures shall not be included under these items.

Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

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DETAIL SHEETS

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PROJECT FILE NO. 609409
- PRELIMINARY ESTIMATE OF QUANTITIES - DETAIL SHEET -
CITY/TOWN – SPRINGFIELD YEAR 2025
BRIDGE REPLACEMENTS April 11, 2025

ORDER No. _____

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT
TEN PARK PLAZA - BOSTON, MA

- PRELIMINARY ESTIMATE OF QUANTITIES - DETAIL SHEET -

CITY/TOWN:	SPRINGFIELD	YEAR:	2025
STA:	11+00 TO 19+44	ROAD:	ARMORY STREET
Type of Project:	ARMORY STREET OVER CSX MAINLINE AND ABANDONED RAILROAD BRIDGE REPLACEMENTS	CLASS DATE:	URBAN MINOR ARTERIAL April 11, 2025

Unclassified Excavation	1,300	Cu. Yards	Gravel for Sidewalks	36	Cu. Yards
Class "B" Trench Excavation	178	Cu Yards	Gravel for Driveways	26	Cu. Yards
Ordinary Borrow	60	Cu. Yards	Embankment + 15%	60	Cu. Yards

PROPOSED FULL DEPTH PAVEMENT **AREA = 1,630 SY**

SURFACE:	1 1/2" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P) OVER
INTERMEDIATE:	2" SUPERPAVE INTERMEDIATE COURSE 12.5 POLYMER (SIC-12.5-P) OVER
BASE:	4" SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER
SUBBASE:	4" DENSE GRADED CRUSHED STONE FOR SUBBASE OVER 8" GRAVEL BORROW (TYPE b)

PROPOSED PAVEMENT MICROMILLING AND OVERLAY **AREA = 1,647 SY**

SURFACE:	1 1/2" SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC-12.5-P) OVER
MICROMILLING:	1 1/2” (MIN) PAVEMENT FINE MILLING OF EXISTING PAVEMENT
NOTE:	ASPHALT EMULSION FOR TACK COAT SHALL BE RS-1h TO RESIST TRACKING OF HAUL VEHICLES

PROJECT FILE NO. 609409
- PRELIMINARY ESTIMATE OF QUANTITIES - DETAIL SHEET -
CITY/TOWN – SPRINGFIELD YEAR 2025
BRIDGE REPLACEMENTS April 11, 2025

PROPOSED HOT MIX ASPHALT DRIVEWAYS **AREA = 115.3 SY**

SURFACE:	1 1/2" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER
INTERMEDIATE:	2 1/2" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5) OVER
BASE:	8" GRAVEL BORROW (TYPE b)

PROPOSED CEMENT CONCRETE DRIVEWAYS **AREA = 85 SY**

SURFACE:	6" CEMENT CONCRETE (AIR-ENTRAINED 4000 PSI, 3/4", 610 LBS) OVER
BASE:	8" GRAVEL BORROW (TYPE b)

PROPOSED CEMENT CONCRETE SIDEWALKS **AREA = 163.3 SY**

SURFACE:	4" CEMENT CONCRETE (AIR-ENTRAINED 4000 PSI, 3/4", 610 LBS) OVER
BASE:	8" GRAVEL BORROW (TYPE b)

PROJECT FILE NO. 609409
- PRELIMINARY ESTIMATE OF QUANTITIES - DETAIL SHEET -
CITY/TOWN – SPRINGFIELD YEAR 2025
BRIDGE REPLACEMENTS April 11, 2025

ALL ITEMS NOT COMPLETELY DESCRIBED AND LOCATED ON THE PLANS ARE DETAILED AS SHOWN BELOW.

ITEM 101. CLEARING AND GRUBBING

TO 5 FEET BEYOND PROPOSED FINAL SLOPE LIMITS, TEMPORARY SLOPE LIMITS OR CONSTRUCTION LIMITS AS NOTED ON THE PLANS. TREE TRIMMING, WITH NO VERTICAL LIMIT, WILL BE CONDUCTED TO PROVIDE VERTICAL CLEARANCE FOR RELOCATED OVERHEAD WIRES.

ITEM 102.1 TREE TRIMMING

- ALBANY STREET NORTH SIDELINE (TRIMMING OVERHANGING VEGETATION)
- TAYLOR STREET NORTH SIDELINE (TRIMMING OVERHANGING VEGETATION)

ITEM 119. RODENT CONTROL

- 176 ARMORY STREET PRIOR TO DEMOLITION

ITEM 144. CLASS B ROCK EXCAVATION

FOR ROCK REMOVAL ASSOCIATED WITH CLASS B TRENCH EXCAVATION

ITEM 150. ORDINARY BORROW

ORDINARY BORROW IS ALLOWED IS FOR THE REQUIRED COVER MATERIAL AT THE BUILDING DEMOLITION SITE AT 176 ARMORY STREET DUE TO SCHEDULING.

ITEM 156. CRUSHED STONE

FOR STABILIZATION OF BOTTOM OF EXCAVATION AT DRAINAGE STRUCTURES ONLY AS REQUIRED AND AUTHORIZED BY THE ENGINEER.

ITEM 160.2 CONTROLLED LOW-STRENGTH MATERIAL - MECHANICAL EXCAVATABLE (101-300 PSI)

FOR SIGNAL LOCATIONS. ENCASEMENT FOR CONDUIT IN ROADWAYS. ONLY AS AUTHORIZED BY THE ENGINEER WHERE COMPACTION BY STANDARD METHODS IS NOT ACHIEVABLE.

ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS

- AT VERIZON AND EVERSOURCE DUCT BANKS REQUIRING REMOVAL DUE TO CONFLICTS SUBSEQUENT TO MASSDOT-APPROVED LSP RECOMMENDATIONS
- AT ENCOUNTERED PIPES SUSPECTED OF CONTAINING ASBESTOS SUBSEQUENT TO MASSDOT-APPROVED LSP RECOMMENDATIONS
- AT EXISTING BRIDGE DEMOLITION LOCATIONS SUSPECTED OF CONTAINING ASBESTOS SUBSEQUENT TO MASSDOT-APPROVED LSP RECOMMENDATIONS

SEE 176 ARMORY STREET PRE-DEMOLITION SURVEY FOR INVENTORY OF HAZMAT MATERIALS AT THE DEMOLITION SITE.

PROJECT FILE NO. 609409
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ITEM 182.2 REMOVAL OF ASBESTOS

AT LOCATIONS WHERE THE PRESENCE OF ASBESTOS HAS BEEN VERIFIED EXCEPT AS INCLUDED UNDER ITEM 182.3

ITEM 182.3 ASBESTOS ABATEMENT FOR BUILDING DEMOLITION

AT 176 ARMORY STREET

ITEM 309. DUCTILE IRON FITTINGS FOR WATER PIPE

FITTINGS INCLUDE PIPE BENDS, TEES, EXPANSION JOINTS.

ITEM 347.2 2 INCH COPPER TUBING TYPE K

FOR WATER SERVICE FROM PROPOSED 8” WATER PIPE TO THE FREEDMAN PARCEL, NOT SHOWN ON PLANS, AND INTENDED TO APPROX MATCH EXISTING SERVICE LINE SIZE. COORDINATION WITH THE OWNER REGARDING LOCATION IS REQUIRED. UPGRADE TO SIZE GREATER THAN EXISTING SIZE REQUIRES CITY OF SPRINGFIELD APPROVAL.

ITEM 350.06. 6 INCH GATE AND GATE BOX

APPROX LOCATIONS NOTED AND AS ENCOUNTERED DURING THE WORK
STA 11+72, 18’ RT

ITEM 350.08. 8 INCH GATE AND GATE BOX

APPROX LOCATIONS NOTED AND AS ENCOUNTERED DURING THE WORK
STA 42+05, 2’ LT
STA 14+91, 39’ RT
STA 17+34, 39’ RT

ITEM 350.12 12 INCH GATE AND GATE BOX

APPROX LOCATIONS NOTED AND AS ENCOUNTERED DURING THE WORK
STA 12+03, 48’ RT
STA 14+88, 41’ RT
STA 14+93, 41’ RT

ITEM 357.12 12 INCH GATE BOX

CONTINGENCY IN THE EVENT THAT AN EXISTING GATE BOX TO BE ADJUSTED IS DAMAGED AND REQUIRES REPLACEMENT

ITEM 358. GATE BOX ADJUSTED

GATE BOXES REQUIRE TWO ADJUSTMENTS UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER – ONCE FOR MILLED AND BINDER SURFACES AND ONCE FOR FINAL SURFACES.

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ITEM 363.1 1 INCH CORPORATION COCK

FOR TESTING AND DISINFECTION – LOCATION(S) TO BE DETERMINED BY SWSC.

ITEM 363.2 2 INCH CORPORATION COCK

FOR SERVICE CONNECTION FROM PROPOSED 8” MAIN TO FREEDMAN PARCEL.

ITEM 371.06 6 INCH COUPLING

FOR JOINING AND RESTRAINING CUT SQUARE-ENDED 6 INCH WATER MAIN PIPE. FLANGED FITTING CONNECTIONS WILL REQUIRE COUPLINGS TO END-CUT PIPE SECTIONS.

ITEM 371.08 8 INCH COUPLING

FOR JOINING AND RESTRAINING CUT SQUARE-ENDED 8 INCH WATER MAIN PIPE. FLANGED FITTING CONNECTIONS WILL REQUIRE COUPLINGS TO END-CUT PIPE SECTIONS.

ITEM 371.12 12 INCH COUPLING

FOR JOINING AND RESTRAINING CUT SQUARE-ENDED 12 INCH WATER MAIN PIPE. FLANGED FITTING CONNECTIONS WILL REQUIRE COUPLINGS TO END-CUT PIPE SECTIONS.

ITEM 379.2 2 INCH AIR RELEASE VALVE ASSEMBLY

LOCATION(S) TO BE DETERMINED BY SWSC AND TO BE COORDINATED WITH ACCESS FABRICATION THROUGH THE CARRIER PIPE. SEE SPECIAL PROVISIONS.

ITEM 381.01 SERVICE BOX (MUNICIPAL STANDARD)

AT FREEDMAN PARCEL

ITEM 381.3 SERVICE BOX ADJUSTED

CONTINGENCY - TO BE USED WHERE EXISTING SERVICE BOX MAY BE MISSING FROM SURVEY AND MUST BE ADJUSTED

ITEM 431. HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE

FOR PAVEMENT WIDENING LESS THAN 4 FEET, DEPTH OF 8” REQUIRED UNDER INTERMEDIATE COURSE.

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ITEM 451. HMA FOR PATCHING

FOR PERMANENT PAVEMENT PATCHES OF TEST PIT LOCATIONS AND FOR PROPOSED CONDUIT AND DRAINAGE IN AREAS OF EXISTING PAVEMENT AND PROPOSED PAVEMENT FINE MILLING AND RESURFACING AND FOR FILLING POTHOLES THAT OCCUR PRIOR TO FINAL PAVEMENT. NOT INTENDED WHERE FULL DEPTH PAVEMENT WILL SUBSEQIUENTLY BE CONSTRUCTED.

ITEM 472. TEMPORARY ASPHALT PATCHING

FOR TEMPORARY PATCHING IN TRAVEL AREAS THAT WILL BE SUBSEQUENTLY RECONSTRUCTED, FOR TEMPORARY TRAVEL RAMPS AT CHANGES IN GRADE, FOR TEMPORARY ACCESS TO DRIVEWAYS, TEMPORARY PAVEMENT WEDGES AT FULL DEPTH WORK LIMITS, FOR UTILITY TRENCH PATCHES IN LOCATIONS UNDER TRAFFIC WHERE FULL DEPTH PAVEMENT WILL SUBSEQUENTLY BE CONSTRUCTED AND HMA FOR EMERGENCY REPAIR.

ITEM 506.1 GRANITE CURB TYPE VB - CURVED

CURB NOT TO BE INSTALLED AT MOMENT SLABS

STA 11+94.87, 49.9’ RT – STA 11+96.43, 62.3’ RT	13 FT
STA 12+20.25, 16.1’ LT – STA 12+79.17, 18’ LT	55 FT
STA 17+23.81, 25’ RT – STA 17+28.67, 25.4’ RT	5 FT
STA 17+34.79, 27.1’ RT – STA 17+38.78, 29’ RT	6 FT
STA 17+48.86, 38.5’ RT – STA 17+53.38, 50.1’ RT	13 FT
STA 17+99.55, 16’ RT – STA 18+10.3’ RT	11 FT
STA 18+01.70, 23.7’ LT – STA 18+02.69, 28.3’ LT	5 FT
	TOTAL: 107 FT

ITEM 509. GRANITE TRANSITION CURB FOR PEDESTRIAN RAMPS - STRAIGHT

STA 11+76.66, 14.8’ LT – STA 11+83.31, 14.8’ LT	6.5 FT
STA 12+06.97, 34.3’ RT – STA 12+16.11, 31.8’ RT	11 FT
STA 12+14.61, 15.8’ LT – STA 12+20.25, 16.1’ LT	5FT
STA 17+17.79, 18’ LT – STA 17+28.79, 18’ LT	11 FT
STA 17+28.67, 25.9’ RT – STA 17+28.67, 28.5’ RT	3 FT
STA 17+33.67, 39’ RT – STA 17+48.59, 39’ RT	15 FT
STA 17+33.79, 18’ LT – STA 17+40.29, 18’ LT	6.5 FT
STA 17+34.79, 27’ RT – STA 17+34.79, 29’ RT	2 FT
STA 17+34.79, 29’ RT – STA 17+38.78, 29’ RT	4 FT
STA 17+91.41, 30.1’ RT – STA 17+92.17, 36.5’ RT	6.5 FT
STA 18+25.01, 17.5’ RT – STA 18+31.51, 17.5’ RT	6.5 FT
STA 18+36.51, 17.5’ RT – STA 18+44.18, 17.5’ RT	8 FT
STA 18+40.44, 18.3’ LT – STA 18+45.67, 18.3’ LT	5 FT
	TOTAL: 90 FT

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ITEM 509.1 GRANITE TRANSITION CURB FOR PEDESTRIAN RAMPS - CURVED

STA 11+94.77, 50.9' RT – STA 11+96.34, 44.3' RT	7 FT
STA 12+02.08, 36.8' RT – STA 12+06.97, 34.3' RT	5 FT
STA 17+92.51, 18' LT – STA 17+97.01, 19' LT	5 FT
STA 17+93.45, 21.7' RT – STA 17+99.55, 16' RT	8.5
STA 18+37.95, 18.7' LT – STA 18+40.44, 18.3' LT	3 FT
	TOTAL: 29 FT

ITEM 580. CURB REMOVED AND RESET

STA 11+94.43, 57.3' RT – STA 11+99.60, 70.2' RT.	14 FT
STA 12+17.21, 23.4' RT – STA 13+31.93, 17.7' RT	119 FT
STA 12+86.11, 18' LT – STA 13+27.61, 18' LT	43 FT
STA 14+42.69, 17.7' RT – STA 16+18.18, 17.6' RT	176 FT
STA 15+00.39, 18' LT – STA 16+18.12, 18' LT	118 FT
STA 17+07.46, 17.8' RT – STA 17+21.60, 17.8' RT	14 FT
STA 17+07.46, 18' LT – STA 17+92.78, 18' LT	86 FT
STA 18+20.22, 17.5' RT – STA 18+44.18, 17.5' RT	24 FT
STA 18+40.44, 18.3' LT – STA 18+45.67, 18.3' LT	5 FT
STA 41+30.00, 17.4' LT – STA 41+87.36, 18.7' LT	57 FT
*CURB AVAILABLE TO BE RESET	TOTAL: 656 FT

OF THE CURB AVAILABLE TO BE RESET, 190 FT IS REQUIRED TO BE RESET AS SHOWN IN ESTIMATE

ITEM 582. CURB CORNER REMOVED AND RESET

CURB CORNERS AT BOTH DRIVEWAYS WILL BE RESET

ITEM 630.2 HIGHWAY GUARD REMOVED AND DISCARDED

STA 11+98.13, 53.5' RT – STA 12+96.06, 23.5' RT	110 FT
TAYLOR ST LT (CONTINGENCY)	25 FT
	TOTAL: 135 FT

ITEM 645.172 72 INCH CHAIN LINK FENCE (PIPE TOP RAIL) VINYL COATED (LINE POST OPTION)

STA 12+04.28, 68.8' RT – STA 12+19.93, 45.8' RT	40 FT
STA 14+73.73, 68.6' RT – STA 14+75.12, 88.7' RT	20 FT
STA 17+27.75, 44.5' RT – STA 17+54.74, 70.2' RT	30 FT
	TOTAL: 90 FT

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ITEM 647.084 84 INCH CHAIN LINK FENCE (PIPE TOP RAIL) W/BARB (LINE POST OPTION)

STA 12+76.27, 27.6' LT – STA 12+86.21, 26.5' LT	14 FT
	TOTAL: 14 FT

ITEM 651.096 96 INCH CHAIN LINK GATE WITH GATE POSTS AND BARBED WIRE

AT THE FREEDMAN PARCEL DRIVEWAY BETWEEN ENDS OF BARRIER.

ITEM 652.072 72 INCH CHAIN LINK FENCE END POST

(1) 176 ARMORY ST, END OF PROP WALL STA 14+74 RT
(2) 17+16.81, 23.5' LT
(3) STA 17+27.75, 44.5' RT
(4) STA 17+54.74, 70.2' RT

ITEM 652.084 84 INCH CHAIN LINK FENCE END POST

(1) STA 12+86.21, 26.5' LT

ITEM 652.096 96 INCH CHAIN LINK FENCE END POST

(1) END OF THE BRIDGE TO GUARDRAIL TRANSITION-WARWICK ST INTERSECTION STA 12+19.93 RT
(2) END OF CP-PL2, BOTH ENDS OF SIDEWALK GAP AT 145 ARMORY ST STA 17+18.20 LT

ITEM 653.072 72 INCH CHAIN LINK FENCE CORNER OR INTERMEDIATE BRACE POST

ALL STATIONS APPROX AND SHALL BE FIELD FIT

STA 31+33, 20' RT	1
STA 12+21, 45.9' RT	1
STA 12+22, 47.8' RT	1
	TOTAL: 3

ITEM 654.096 96 INCH CHAIN LINK FENCE FABRIC

STA 12+26, 46.5' RT – STA 12+36, 43.5' RT	10 FT
STA 17+18, 23.5' LT – STA 17+18, 28.5' LT	5 FT
	TOTAL: 15 FT

ITEM 657. TEMPORARY FENCE

TO SECURE THE WORK SITE, BY STAGE

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ITEM 665. CHAIN LINK FENCE REMOVED AND STACKED

STA 31+33, 20’ RT (WARWICK ST) – STA 13+14, 25’ RT	165 FT
STA 14+72.37, 25.5’ RT – STA 14+75, 74.4’ RT	65 FT
STA 14+72.37, 25.5’ RT – STA 16+27.28, 40.9’ RT	130 FT
	TOTAL: 360 FT

ITEM 666. CHAIN LINK FENCE REMOVED AND RESET

STA 13+39, 44’ RT – STA 13+44, 60’ RT	20 FT
	TOTAL: 20 FT

ITEM 671. FENCE GATE AND GATE POST REMOVED AND STACKED

AT THE FREEDMAN DRIVEWAY

ITEM 767.121 SEDIMENT CONTROL BARRIER

PLACED AT SLOPE LIMITS OF ALL DISTURBED SOIL

STA 12+03.02, 68.1’ RT – STA 13+49.12, 39.7’ RT	214 FT
STA 12+87.11, 25.4’ LT – STA 13+33.87, 25.2’ RT	54 FT
STA 14+41.37, 54.3’RT – STA 14+75.73, 68.6’ RT	44 FT
STA 14+72.44, 68.1’ LT – STA 16+32.32, 29.8’ LT	188 FT
STA 14+99.72, 67’ RT – STA 16+29.73, 54.5’ RT	163 FT
STA 16+95.02, 43.2’ RT – STA 17+56.52, 87.3’ RT	83 FT
STA 17+92.51, 23.5’ LT – STA 18+02.69, 28.3’ LT	13 FT
	TOTAL: 760 FT

ITEM 856.12 PORTABLE CHANGEABLE MESSAGE SIGN

- PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE OPERATED ON THE APPROACHES TO THE WORK ZONE 7 DAYS PRIOR TO THE APPROVED WORK SCHEDULE
- FOR DETOURS

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CSX RAILROAD SPECIAL PROVISIONS

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CSX

PUBLIC PROJECT INFORMATION

For Construction and Improvement
Projects That May Involve the Railroad

Prepared by the Public Projects Group
CSX Transportation Inc. Jacksonville, FL

Last revised March 2025

INTRODUCTION

To the Communities, Businesses and Government Agencies We Serve:

CSX Corporation and its business units provide rail and intermodal service in 26 states, the District of Columbia and two Canadian provinces. CSX operates over 20,000 miles of track, helping North America maintain the strongest and most productive transportation system in the world.

In addition to CSX's vitally important customer service responsibilities, the company wants to be a good neighbor in the communities where we operate. That is why we have prepared this information. We want to make it easier for communities and other project sponsors to work with us when they have construction and improvement projects that may involve CSX rail property.

CSX's Public Projects team is involved in a wide variety of projects initiated by government agencies, local businesses and others. Accurate and timely communication of information between CSX and these parties improves planning, relationships and successful completion of projects. The tools in this manual explain important steps project sponsors must follow, including information required in connection with any public project proposal.

CSX places the highest priority on safety – for its employees and for the public. Because CSX is a business and its shareholders ultimately own its rail system, the company must also give careful consideration to anything that could adversely affect customer service, compensation for use of railroad property, and risk to railroad operation.

The Project Managers –

Public Projects Managers are the initial contact for CSX and are assigned territories by state. Please contact them directly about public projects using the information provided. General Engineering Consultants (GEC) provide additional engineering services to assist CSX in managing public projects.

CSX hopes the information and procedures provided here will make it easier for us to work together.

Will Roseborough

Director Project Development and Public Projects

CSX

PUBLIC PROJECT INFORMATION

For Construction and Improvement Projects That May Involve the Railroad

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Additional information can be obtained by contacting the following:

American Railway Engineering and Maintenance of Way Association, (301) 459-3200, or www.arema.org

U.S. Department of Transportation, Manual of Uniform Traffic Control Devices, http://mutcd.fhwa.dot.gov/

INFORMATION COVERED IN THIS MANUAL

This information is intended to assist communities and other project sponsors to plan and implement construction and improvement projects that may involve the CSX rail property.

Examples of such projects include:

Highway-Rail Grade Crossings:

Closure, removal, installation and alterations of public highway-rail grade crossings. CSX Real Estate department manages private crossings.

Bridges Over CSX:

Construction, reconstruction, rehabilitation, repair, removal, and maintenance of bridges over the railroad by outside parties.

Bridges Carrying CSX:

Construction, reconstruction, rehabilitation, repair, removal, and maintenance of bridges carrying CSX over highways and other public properties initiated by outside parties.

Parallel Roads/Facilities:

Construction, reconstruction, modification, removal, and maintenance of parallel roads or other public facilities affecting CSX property or operations.

U.S. Army Corps of Engineers Projects:

Any project undertaken by the Corps of Engineers that involves CSX property or operations.

Entry Onto CSX Property:

Temporary rights of entry onto CSX property, easements, utility installation and bridge inspections.

Other Projects Involving CSX Rail Corridors:

Publicly sponsored projects involving or altering CSX facilities or its property. These projects may be on, above, adjacent to, or otherwise have the potential to impact CSX property.

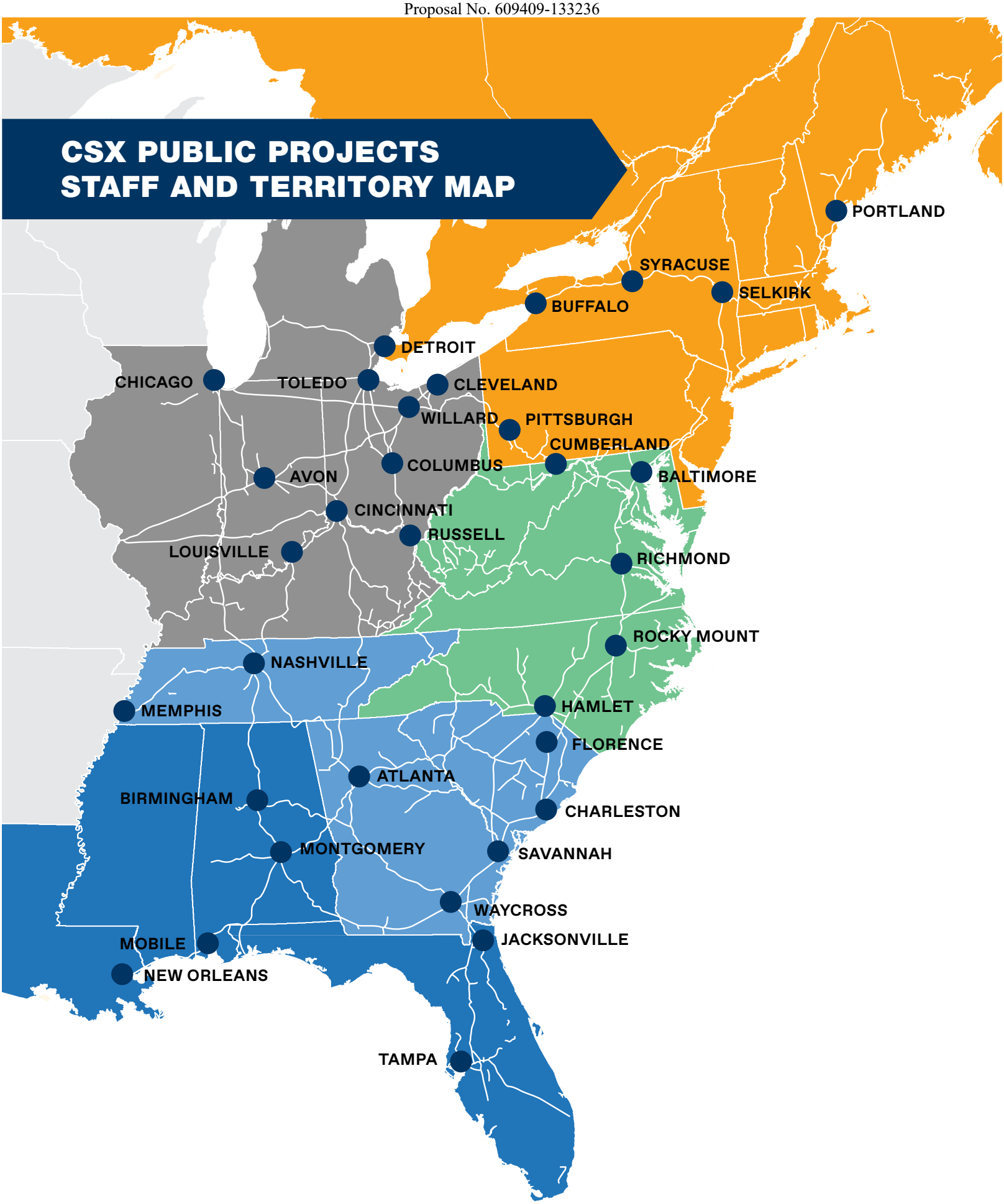
Important notes:

The information herein is intended to be a tool only and all statements in this manual are intended to be for broad use. This manual cannot be taken as authority to construct. Specific projects will be subject to analysis of all factors leading to formal agreements between all parties. The purpose of review by CSX is solely to ensure compliance with the minimum standards of CSX, and not for any other purpose.

The guidelines and requirements herein are provided for reference only and are subject to revision without notice. All new projects shall be designed in accordance with the most current policies, requirements, and standards of CSX.

Any items affecting railroad property not covered in this manual shall be subject to CSX's prior review and approval.

The safety of CSX employees and the general public is of paramount importance to CSX.


CSX PUBLIC PROJECTS
STAFF AND TERRITORY MAP
PORTLAND
SYRACUSE
SELKIRK
BUFFALO
DETROIT
CHICAGO
TOLEDO
CLEVELAND
WILLARD
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RICHMOND
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NASHVILLE
MEMPHIS
HAMLET
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ATLANTA
BIRMINGHAM
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ADDITIONAL CSX RESOURCES AND CONTACTS

Many areas of community interest are outside the scope of this manual. The following is a list of contacts within CSX that may be helpful on other community matters:

- **Emergencies:** Emergencies and suspicious situations should be reported immediately to the CSX Public Safety Coordination Center (800) 232-0144.

- **Corporate Communications and Public Affairs:** News media information, public affairs, state and community relations. Contact: (904) 366-2949.

- **Industrial Development:** New industry site locations, track proposals. Contact: Director Technical Programs, Regional Development (904) 359-1617.

- **CSX Real Estate:** Non-Construction and Environmental right-of-entry, wire line and pipeline crossings, private crossings, compliance with codes relating to right-of-way conditions. Contact: https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/permitting-utility-wireless-infrastructure-installations-and-rights-of-entry/

- **Quiet Zones**:
  Contact: crossingrequests@csx.com

- **Railroad Track and Signal Maintenance:** Non-emergency track maintenance, drainage maintenance, maintenance of highway-rail grade crossings surfaces and warning systems. Contact: TellCSX@csx.com

- **Real Estate Lease or Purchase:** Contact: https://www.csx.com/index.cfm/customers/value-added-services/ property-real-estate/

- **CSX Real Estate Easements for Public Improvement Projects:** If no property rights are in place for the affected CSX property, those rights will need to be established thru CSX Real Estate prior to letting of the public project into construction.
  Contact: Public_ProjectsRPI@csx.com

- **Structures and Bridges:** Maintenance of bridges that are CSXT's responsibility. Contact: Assistant Chief Engineer - Structures (904) 359-1104.

- **Passenger Operations:** Amtrak, passenger train proposals, commuter train proposals, light rail corridors. Contact: Director Passenger Services Strategy (904) 359-1099.

- **Rails to Trails:** Conversion of unused rail lines to trails. Contact: https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/

- **Non Emergency Issues:**
  Contact: tellcsx@csx.com

I. Definitions

1. Agency – The project sponsor (i.e., State DOT, Local Agencies, Private Developer, etc.)

2. AREMA – American Railway Engineering and Maintenance-of-Way Association – the North American railroad industry standards group. The use of this term shall be in specific reference to the AREMA Manual for Railway Engineering.

3. Construction Submission – The Agency or it's representative shall submit 1 hard copy set and 1 electronic set of plans, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans, specifications, and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.

4. Controlled Demolition – Removal of an existing structure or subcomponents in a manner that positively prevents any debris or material from falling, impacting, or otherwise affecting CSX employees, equipment or property. Provisions shall be made to ensure that there is no impairment of railroad operations or CSX's ability to access its property at all times.

5. Contractor – The Agency's representative retained to perform the project work.

6. Engineer – CSX Engineering Representative or a GEC authorized to act on the behalf of CSX.

7. Field Construction Inspector (FCI): CSX may elect to use a contracted construction inspector in lieu of, or in addition to, a CSX employee flagman.

8. Flagman – A qualified CSX employee with the sole responsibility to direct or restrict movement of trains, at or through a specific location, to provide protection for workers.

9. GEC – General Engineering Consultant who has been authorized to act on the behalf of CSX. GECs perform preliminary engineering, construction inspection, and monitoring under the direction of the CSX Engineering personnel. GEC personnel also perform day-to-day administration of certain types of projects.

10. Horizontal Clearance – Distance measured perpendicularly from centerline of any track to the nearest obstruction at any elevation between TOR and the maximum vertical clearance of the track.

11. Professional Engineer – An engineer who is licensed in State or Commonwealth in which the project is to occur. All plans, specifications, and supporting calculations shall be prepared by the Professional Engineer and shall bear their seal and signature.

12. Potential to Encroach – Work having the possibility of impacting CSX property or operations; defined as one or more of the following:

    a. Any activity where access onto CSX property is required.

    b. Any activity where work is being performed on CSX ROW.

    c. Any excavation work adjacent to CSX tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the CSX property limits.

    d. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Note that hoisting equipment with the potential to foul must satisfy the 150% factor of safety requirement for lifting capacities.

    e. Any work where the scatter of debris or other materials has the potential to encroach within twenty five feet (25'-0") of the nearest track centerline.

    f. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.

    g. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by CSX.

13. ROW – Right of Way; Refers to CSX Right-of-Way as well as all CSX property and facilities. This includes all aerial space within the property limits, and any underground facilities.

14. Submission Review Period – A minimum of 30 days will be required for the initial review response. Up to an additional 30 days may be required to review any/all subsequent submissions or resubmission.

15. Theoretical Railroad Live Load Influence Zone – A 1 horizontal to 1 vertical theoretical slope line starting at bottom corner of tie.

16. TOR – Top of Rail. This is the base point for clearance measurements. It refers to the crown (top) of the steel rail; the point where train wheels bear on the steel rails. Use the higher of the two rails when track is superelevated.

17. Track Structure – All load bearing elements which support the train. This includes, but is not limited to, the rail, ties, appurtenances, ballast, sub-ballast, embankment, retaining walls, and bridge structures.

18. Vertical Clearance – Distance measured from TOR to the lowest obstruction, within six feet (6'-0") of the track centerline, in either direction.

REQUIREMENTS FOR PRELIMINARY ENGINEERING REVIEW

Overview

Any project proposals that may affect or be near the CSX right-of-way must be evaluated by CSX. To initiate a construction or improvement project, a PE agreement is required to identify the project sponsor, the scope, define the tasks to be accomplished, and specify the payment required. Once the plans for the project are approved by CSX, a construction agreement will be developed.

Purpose

The purpose of PE is to identify issues related to safety, engineering, customer service, operations, legal and regulatory matters, expense, risk and other considerations specific to any proposed project. CSX review of plans is only to determine that the plans, and improvements constructed in accordance with the plans, satisfy CSX's requirements and do not adversely impact or damage CSXT property interests. Plans should be submitted early in project development to ensure that CSX requirements can be incorporated.

Key Points

- Starting CSX Preliminary Engineering (PE) early by providing conceptual plans lowers project costs and shortens the time required for CSX review and approval.
- Using standard agreements lowers costs and saves time.
- If the proposal requires an encroachment within CSXT Right-of-Way, the project sponsor should contact the CSX Real Estate Department when beginning PE.
- If the proposal requires a utility encroachment, the project sponsor should contact CSX Real Estate Department when beginning PE.
- CSX PE Review will not begin until the PE Agreement is fully executed and PE funds are received.

Process Steps To Be Taken

- Notify CSX Public Projects Group of the project by providing location information and conceptual plans.
- Complete and Submit New Project Initiation Form.
- Provide CSX authorization to incur preliminary engineering costs.
- Review and complete a standard PE agreement and provide payment for expenses as specified in the agreement.
- Provide project information; attend meetings (as needed), review site with CSX or GEC personnel.
- Submit initial plans to CSX or designated GEC for review.
- Respond to CSX or designated GEC comments and adjust design if necessary.
- Coordinate with CSX Real Estate as required
- Submit final design for CSX or designated GEC review.
- CSX will perform final review to ensure compliance with railroad requirements.
- CSX will estimate the cost of the work to be done by CSX, including flagging.
- If CSX takes no exceptions to the design plans (or once all CSX concerns have been addressed), CSX will prepare a standard construction agreement for execution.

Costs and Expenses

These matters are covered in more detail in the section that follows ("Payment of CSX's Costs and Expenses"). For the reasons described in that section, CSX requires advance payment for its costs and expenses of reviewing and handling the PE. All expenses of the party seeking the review will be borne by that party, including expenses for CSX employees or GEC personnel attending meetings, reviewing plans, preparing correspondence and other activities to support the review of the project.

Timing

It is in the interest of all parties to complete the PE review before commitments are made or construction steps begin. CSX will work to be responsive, with timing depending upon the complexity of the project. CSX and its GEC will work with the project sponsor to schedule PE and construction to meet project schedule objectives whenever possible, considering available resources.

Property Rights

Construction and improvement projects involving CSX property will require a conveyance of property rights,
FOR EXAMPLE:

- Highway-Rail Grade Crossings
- Bridges Over CSX
- Parallel Roads/Facilities
- Road/Bridge Widening Projects

Before CSXT will issue a Notice to Proceed for construction within their property, formal property rights will need to be verified through the CSXT Real Estate Department. CSXT Real Estate will confirm the real estate requirements for each project.

If an easement is necessary, the below listed information* will be required for review and processing:

- Cover letter – identifies the type(s) of easement(s) and why each easement area is needed. This information will assist in ensuring the correct easement(s) is/are referenced in the deed. The Construction Easement request, if temporary, includes the length of time this type of easement will be needed. The letter also includes contact information for the project contact. An email address for the project contact is to be included.
- Offer (Good Faith Offer or Fair Market Value (FMV)
- Metes and bounds description for each easement area is required to identify the easement boundaries to be included within the deed. CSXT will not be able to commence review without the metes and bounds description.
- Right-of-Way Detail Sheet calling out the easement area(s)

**Any missing information will result in a delay in processing*

Standard Documents and Estimates

CSX executes hundreds of agreements each year for preliminary engineering and construction of projects. CSX has developed standard agreements which can be executed by CSX without additional legal review. Non-standard agreements or modifications to the CSX standard agreement terms will require additional legal review and may increase project duration and/or cost. Sample standard agreement documents are available in the Appendix. CSX will begin each project with a PE estimate and PE agreement. After execution of the PE agreement and receipt of the PE deposit, CSX will complete the PE phase of the project. At the end of the PE phase, CSX will provide the project sponsor a construction estimate for all required CSX costs during the construction phase of the project. CSX provided estimates are valid for one year from date of approval noted on the estimate form.

PAYMENT OF CSX'S COSTS AND EXPENSES

Overview

The types of projects being addressed in this manual usually do not directly benefit and, in some cases, create risk to, and hurdles for, CSX's core business of providing transportation service vital to its customers and the North American economy. For these reasons, CSX seeks payment for its costs and expenses incurred in connection with project review or construction.

Examples of Costs and Expenses

Agency shall reimburse CSX for all costs and expenses incurred by CSX in connection with the Project, including, without limitation:

- All out of pocket expenses
- Travel and lodging expenses
- Telephone, facsimile, and mailing expenses
- Costs for equipment, tools, materials and supplies
- Sums paid to CSX's consultants and subcontractors
- CSX labor in connection with the Project (included but not limited to flagging), together with CSX labor overhead percentages established by CSX pursuant to applicable law
- For estimating purposes only, typical flagging costs are $1,300 per day

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Key Points

- Preliminary Engineering (PE) costs are paid in advance.
- CSX construction expenses will be estimated during PE and the estimate will be incorporated into the construction agreement. Advance payment is required to cover these expenses prior to the start of project construction.
- If CSX anticipates that actual expenses will exceed the advance payment, additional payment will be required. Project work may be stopped until additional payment is received.
- If CSX's actual expenses are less than the sum of any deposits the difference will be refunded after final cost accounting.
- All funding sources must be identified up front, and any time funding sources change, CSX must be immediately informed. CSX requires the completion of a "New Project Initiation Form" at the beginning of each project. By completion of this form, the project sponsor agrees to reimburse CSX for project related costs. Each time project funding changes, a new "New Project Initiation Form" must be completed.
- All costs associated with any real estate or utility transaction will be handled separately with the CSX Real Estate Department.

INSURANCE REQUIREMENTS FOR PUBLIC PROJECTS

I. Insurance Policies:

Agency and Contractor, if and to the extent that either is performing work on or about CSX's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than $5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured. The policy shall include endorsement ISO CG 24 17 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.

2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than $1,000,000, which insurance must contain a waiver of subrogation against CSX and its affiliates (if permitted by state law).

3. Commercial automobile liability insurance with limits of not less than $1,000,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured. The policy shall include endorsement ISO CA 20 70 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.

4. Railroad protective liability insurance with limits of not less than $5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of $10,000,000, which insurance shall satisfy the following additional requirements:

   a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.

   b. CSX Transportation must be the named insured on the Railroad Protective Insurance Policy.

   c. Name and Address of Contractor and Agency must appear on the Declarations page.

   d. Description of operations must appear on the Declarations page and must match the Project description.

   e. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.

   f. Authorized endorsements may include:

      (i). Broad Form Nuclear Exclusion - IL 00 21

      (ii). 30-day Advance Notice of Non-renewal or cancellation

      (iii). Required State Cancellation Endorsement

      (iv). Quick Reference or Index - CL/IL 240

g. Authorized endorsements may not include:

(i). A Pollution Exclusion Endorsement except CG 28 31

(ii). A Punitive or Exemplary Damages Exclusion

(iii). A "Common Policy Conditions" Endorsement

(iv). Any endorsement that is not named in Section 4 (e) or (f) above.

(v). Policies that contain any type of deductible

5. All insurance companies must be A. M. Best rated A- and Class VII or better.

6. The CSX OP number or CSX contract number, as applicable, must appear on each Declarations page and/or certificates of insurance.

7. Such additional or different insurance as CSX may require.

II. Additional Terms:

1. Contractor must submit the original Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies to:

   Insurance Department
   CSX Transportation, Inc.
   500 Water Street, C-907
   Jacksonville, FL 32202

   insurancedocuments@csx.com

2. Neither Agency nor Contractor may begin work on the Project until it has received CSX's written approval of the required insurance.

ENTRY ONTO CSX PROPERTY

Overview

To maintain efficient customer service and to ensure the safety of CSX employees and of those parties requesting access to CSX property, CSX requires all parties accessing its right-of-way for investigative activities or for the performance of construction work to have a written agreement with CSX fully detailing each party's responsibilities. Activities by others with the potential to affect CSX's property, operations, and or personnel without actually entering CSX property must also be reviewed with CSX and appropriate arrangements and agreements completed.

The process by which an appropriate agreement covering entry and/or the other necessary conditions or requirements can be developed and implemented is typically dependent upon the scope of the activities proposed by an outside party or agency. Although the type of agreement may vary, most agreements include insurance and liability provisions, work procedures and conditions and reimbursement provisions relating to payment to CSX for costs it may incur in relation to the entry or work. The following summarizes the various types of CSX agreements and contracts most frequently utilized to accommodate the requested entry and the proposed work activities.

Key Points

Written permission is required for all parties entering CSX property.

- Construction Agreements authorize entry onto CSX property.
- Temporary right-of-entry agreements can also be used for limited purposes.
- CSX Real Estate handles temporary rights of entry for non-construction activities.
- CSX Public Projects handles temporary rights of entry for construction activities.
- All parties must adhere to CSX Safety procedures.
- Appropriate insurance is required.

Entry for Construction Work

Entry for construction work (not exclusively associated with utility work) will require a Construction Agreement or a Temporary Right-of-Entry Agreement, as determined by the magnitude of potential impacts to CSX.

A Construction Agreement will be required for construction work that could impact CSX facilities or operation, such as construction or rehabilitation of a bridge over CSX, roadway construction or other highway improvements, or grading and/or drainage work. Additional agreements may be required for any permanent improvements/encroachments within CSX corridors or property.

Construction work that will not impact CSX facilities or operation may be handled by a Temporary Right-of-Entry Agreement, as determined by CSX Public Projects.

Entry for Non-Construction Work

A Temporary Right-of-Entry agreement is utilized by CSX primarily in situations where outside parties or agencies desire to undertake investigative work such as performing survey work, taking borings, performing bridge inspections or undertaking other activities requiring only access to CSX property and not construction work activities. Different agreements are used for temporary private crossings.

Applications for Temporary Right-of-Entry agreements for investigative and non-construction work activities (including movement of off-highway or oversized loads at grade crossings) within CSX's right-of-way can be obtained by contacting CSX Real Estate at https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/permitting-utility-wireless-infrastructure-installations-and-rights-of-entry/

Entry For Other Purposes

CSX may use other forms of agreements covering entry by outside parties or agencies depending on work scope or other factors. The process to obtain right of entry for these purposes as listed below may also be initiated through CSX Real Estate at https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/

- Environmental Right-of-Entry
- Utility Permit/License Agreement for pipeline and wire line construction – both for specifications and applications
- Land Lease applications
- Movement of oversized loads across CSX tracks at private or public highway-rail grade crossings
- Movement of off highway construction equipment across CSX tracks at private or public highway-rail grade crossings.

CONSTRUCTION MONITORING REQUIREMENTS

Overview

To ensure the safety of the public and CSX employees, maintain quality rail service to CSX customers and to protect CSX assets, CSX may require construction monitoring (in addition to flagging protection) of the project. The construction monitoring will be conducted by CSX and its consultants at project expense.

Key Points

- Construction work affecting CSX will be monitored by CSX and its consultants at the project sponsor's expense.
- Construction monitoring is in addition to flagging and other protective services.

General Guidelines

Construction monitoring includes intermittent or continuous on-site presence of CSX or its consultants during construction activities.

- The construction project sponsor, owner, or agency in charge will pay for the cost of construction monitoring. Construction monitoring will be specified, and the estimated cost will be included in the construction agreement for the project.

- Construction monitoring is in addition to railroad-approved flagging.

- Construction monitoring includes CSX review and approval of all plan changes and required contractor submissions during the construction phase of the project.

- The project sponsor is responsible for its safety and the safety of its property, contractors, and employees. CSX, as part of its construction monitoring, will review the work site for activities that could interfere with safe operation of the railroad.

- CSX and its consultants are not responsible for monitoring the general work activities under the direction of the project sponsor for compliance with safety regulation. Any observed unsafe acts or conditions will be reported immediately to the project sponsor or contractor representative.

RAILROAD FLAGGING FOR ACTIVITIES ON OR NEAR CSX PROPERTY AND TRACKS

Overview

In the interest of public safety and the safety of employees and property, CSX will work cooperatively with agencies, consultants, contractors and others who need to access railroad property when work brings them in close proximity to active railroad tracks to determine the appropriate flagging services needed and to make arrangements for those services.

Conditions When CSX Flagging Services Are Required:

- When any entity is working on, near or adjacent to active railroad tracks.
- When an outside party is using railroad property or performing operations that may affect railroad property or facilities. This includes occasions when a party has been given express permission from CSX to enter railroad property or perform such operations under the terms of a Construction agreement, Temporary Right-of-Entry agreement or other appropriate documentation.
- When work off of railroad property has the potential to impact CSX property or operations.
- When off-highway construction equipment is crossing the railroad at a private or public crossing.
- When oversized equipment or highway vehicles are to cross the railroad at a private or public crossing.
- In other instances as determined by CSX.

Key Points

Flagging services are required when projects are within close proximity to active rail lines, as required by federal law.

- Flagging services can only be performed by personnel qualified by CSX.
- Arrangements for flagging services may take up to 90 days to schedule.
- It should be understood that occasions may arise during the life of the project when CSX must temporarily reassign the project Flagman to meet the changing demands of operating its railroad. This can occur without advance warning. CSX will make every effort to coordinate events to minimize scheduling conflicts, but there may be circumstances that will cause temporary inconvenience to the project.

Construction activities shall be planned in such a manner as to minimize the amount of time flagging services are needed.

Qualified Flagging Personnel

CSX flagging services may only be performed by personnel qualified by CSX who are trained in the proper procedures related to rail operations and safety requirements, familiar with rail operations and procedures in a project area and able to communicate directly with CSX dispatching personnel and train crews.

Arrangements for CSX Flagging Services

- CSX will make arrangements for flagging services related to planned work by an outside party under the terms of a temporary right-of-entry agreement, construction agreement, environmental license agreement or other mutually acceptable arrangements.
- Advance notice must be provided to secure CSX flagging services. The level of advance notice may vary from site to site or project to project or if CSX determines, under the provisions of its labor agreements with its union forces, that flagging services can only be provided as a result of the flagging position being bid and awarded to qualified CSX personnel.
- Advance notice must be provided to cancel CSX flagging services. If advance notice to cancel is not provided, the project sponsor will be responsible for paying for the flagging until CSX is notified. Requests to cancel or end flagging should be given at least 3 days in advance.

Responsibility for Costs and Expenses

- All costs and expenses associated with CSX flagging services are the sole responsibility of the agency, consultant or contractor.
- CSX will provide its estimated costs prior to the start of the project work or its assignment of flagging personnel.
- Once flagging personnel are formally assigned by CSX to a specific work location, the period of assignment can only be changed with appropriate advanced arrangements.
- Charges for providing flagging services beyond a normal eight-hour weekday are calculated and billed at an overtime rate.
- For initial planning purposes, typical flagging cost is $1,300 per day.

Examples of Flagging Costs and Expenses

Charges billed by CSX to the agency, consultant or contractor may include, but are not limited to:

- Employee Salary
  - Hourly employee charges are based on the time an employee departs and returns to his or her headquarters location. As such, the charges can be expected to exceed the level actually incurred during the assigned coverage period or while the flagman is present at the specific work location.
  - This period also includes the time required for flagging personnel to perform the required preparations and termination procedures associated with flagging services at a location.
- Overhead Costs
  - These charges are assessed against the hourly employee charges and determined in accordance with standard accounting procedures or as mandated by governmental regulations.
- Employee Expenses or Per Diem Rate
  - This amount is calculated based on an employee's actual expenses or on a per diem rate according to the terms of applicable collective bargaining agreements between CSX and its assigned union flagging employees.
  - The amount includes travel and lodging expenses and the cost for a leased, rented, CSX, or personal vehicle to be used for transportation.
- Administrative, Accounting, and Billing Services
  - This amount is related to the time associated with setting up the agreement, arranging for and supervising the employee, billing and collection of costs, and other expenses associated with CSX providing flagging services.
- Field Construction Inspector (FCI)
  - CSX may elect to use a contracted construction inspector in lieu of, or in addition to, a CSX employee flagman.

HIGHWAY-RAIL GRADE CROSSING SURFACE MAINTENANCE AND REPLACEMENT

Overview

The crossing surface provides a path for highway vehicles to cross railroad tracks. The objective is to provide a safe, smooth, and cost effective crossing for highway and railroad traffic. Highway and railroad maintenance work in the vicinity of highway-rail grade crossings must consider safety concerns for both highway and railroad traffic before, during, and after the time the work is implemented.

Identification of the crossing and location

Each crossing has a unique DOT inventory identification number posted at the crossing. There is often more than one crossing on the same road. The crossing number (such as 123456A) must be used to identify the specific crossing in all communications with the railroad to reduce possible confusion about the specific location.

Key Points

- Report issues with crossing surfaces to TellCSX (TellCSX@csx.com)
- Coordination is required for work near crossings.
- Highways must be closed to vehicular traffic for crossing replacement or maintenance work.
- Agreements with CSX are required for crossing work and work near crossings.
- Crossing surface maintenance and replacement must be performed by CSX.
- Crossing surfaces must meet criteria set by CSX's Engineering Standards.
- For identification purposes, each crossing has a distinct DOT inventory number (such as 123456A) posted at the crossing and the railroad milepost.

When track maintenance necessitates the repair of the crossing, the cost of said repair will be the responsibility of the Agency, per applicable agreements.

Crossing Construction

Railroad track is continuous through the crossing and includes railroad ties, rail and fasteners below the surface of the crossing. The crossing surface for highway traffic can be made of several different materials. Drainage is required for all four quadrants at a crossing.

Crossing Surface Types and Selection

Crossing surface material and construction methods are selected for each crossing based on the type of highway and railroad traffic, past experience and funding available from highway agencies for individual projects.

Standard types of CSX approved crossing surfaces are Concrete or Timber/Asphalt. Projects funded by outside parties may be constructed with other materials if specified by the outside party and approved by CSX. Modular Platform “Tub” type crossings may be considered for use at locations with slow rail operations of 15 MPH or less and high road vehicle count and/or heavy vehicles.

Crossing Maintenance and Replacement

Crossing maintenance and replacement of the track and crossing surface are performed by CSX and may be billable to an outside party or highway authority as specified in an agreement. The responsibility for the maintenance of public crossing approach pavement varies by state and is specified in some individual crossing agreements or orders.

Crossing work requires closing the entire highway-rail grade crossing. Replacement of track components through a crossing requires removal of the crossing surface, replacement of track ballast, and surfacing the track through the crossing prior to replacement of the crossing surface. If the subgrade needs to be improved, the application of a hot mixed asphalt underlayment should be considered. Drainage will be reestablished for all four quadrants. After the crossing surface is replaced, the highway approach paving is completed and then the road is opened to highway traffic. Replacement of the track and crossing surface usually requires that the highway be closed for several days.

Crossing surfaces are also removed and replaced when track maintenance work is performed through a crossing such as rail replacement, tie replacement, and track surfacing (smoothing). Each crossing has the surface removed and replaced after the work has been completed. Crossings are usually closed for several days during this maintenance work.

Requesting Crossing Surface Replacement or Upgrades

Highway agencies seeking replacement of crossing surfaces should contact CSX Public Projects. The request for the work and the recommended surface must be reviewed and approved by CSX. If approved, Public Projects will prepare a standard agreement and include the cost estimate for the project.

ALTERATIONS TO HIGHWAY-RAIL GRADE CROSSING WARNING DEVICES

Overview

The Public Projects Group will process all projects proposing alterations to public highway-rail grade crossing warning systems. Included will be projects for opening new crossings, closing existing crossings, modifying or widening of existing crossings, installing new warning systems, removing and/or relocating existing warning systems and modifying/upgrading existing warning systems.

Identification of the crossing and location

Each crossing has a unique DOT inventory identification number posted at the crossing. There is often more than one crossing on the same road. The number (such as 123456A) must be used to identify the specific crossing in all communications with the railroad to reduce possible confusion about the specific location.

Key Points

- Any alterations to highway-rail grade crossing warning systems must adhere to all applicable laws, regulations and national standards.
- Requests to CSX for new or modified public at-grade crossing warning devices must be initiated by the highway agency.
- Preliminary Engineering agreements are used to define the project scope and prepare design and estimate information for each project.
- The requesting project sponsor will be responsible for advance payment for engineering, design and installation of warning devices.
- The coordination of traffic intersection signals with warning devices will be determined by the highway agency or regulatory agency.
- Construction agreements are used to implement the projects.
- Advanced Preemption timing will be limited to 50 seconds.

Design Considerations

Highway-rail grade crossing warning systems must adhere to all applicable Federal and State standards and regulations, and local policies, laws and ordinances, as well as CSX standards. The highway agency, not CSX, is responsible for determining the level and configuration of warning devices for a public highway-rail grade crossing. In addition, the highway agency or other governmental agency responsible for making warning system and equipment determinations is responsible for selecting appropriate vehicular traffic control signs and/or devices for a specific public highway. Loop Detection Circuitry will not be designed, installed, owned, or maintained by CSX.

Recommended practices and additional information are available in American Railway Engineering and Maintenance of Way Association (AREMA) manuals and the Manual on Uniform Traffic Control Devices (MUTCD)

Engineering, Cost Estimation, Installation

CSX will provide engineering, design, and cost estimates for the installation of highway-rail grade crossing warning devices at the expense of the project sponsor as part of the Preliminary Engineering for a project. Changes to highway-rail grade crossing surfaces may also require engineering and estimating by CSX. Because of labor agreements with CSX's union forces, CSX will install the highway-rail grade crossing warning devices.

Operation of Highway-Rail Grade Crossing Warning Devices

Highway-rail grade crossing warning systems are designed to activate in advance of a train entering the crossing. Train speed changes while approaching the crossing may cause the warning system to activate longer than expected. Trains stopping or making forward and reverse movements near the crossing may cause the warning system to activate and then clear after an appropriate time without a train entering the crossing.

Traffic Light Preemption Interconnection

The highway agency will determine if preemption is required. Preemption of the cycle of traffic signals at highway intersections near highway-rail grade crossings requires careful review by highway traffic engineers to determine the appropriate timing and sequence for both the traffic signal and the highway-rail grade crossing warning system. Preemption for the traffic signal may be simultaneous with, or in advance of, the warning system activation. The appropriate sequence and timing shall be provided by the highway agency and distributed to CSX to facilitate CSX's signal design. CSX will furnish one preemption interconnection circuit of a normally closed contact that is designed to open upon the approach or presence of a train and will terminate the closed preemption interconnection circuit in a common cable junction box to be used for the interconnection of the traffic signals and the grade crossing warning devices.

Advanced Preemption Timing

For grade crossing warning systems interconnected with highway traffic signals, the 2018 AREMA C&S Manual limits advanced preemption timing to 50 seconds (plus equipment response time), and CSX will abide by this standard. For more information refer to 2018 AREMA C&S Manual Part 3.1.10, section C.1

OVERHEAD AND UNDERGRADE BRIDGE PROJECTS

Overview

Given the efficiencies and environmental benefits of moving goods by rail, CSX continues to see strong demand for rail services across its network. It is critical that CSX maintain the ability to expand its network in the future.

CSX requires that new overhead bridges (including existing bridge replacements) span CSX's right-of-way and have a minimum 23' vertical clearance above top of rail. CSX requires that new undergrade bridges provide accommodations for future operating needs, as determined by CSX.

During project construction, rail operations must not be impeded. Temporary run-around track(s) and/or phased construction may be necessary as determined by CSX.

Key Points

- Overhead and undergrade bridge projects must comply with CSX's policies and standards, which are available in the appendices of this manual.
- All work on overhead and undergrade bridges must be reviewed and approved by CSX.
- CSX should be involved early in the project development phases to allow required bridge standards to be incorporated into the design of the project.
- A preliminary engineering agreement and construction agreement will be required.
- CSX property and operations (including train speeds) shall not be negatively impacted by the project.
- No temporary reduced clearances will be permitted.
- CSX requires that new overhead bridges (including existing bridge replacements) clear span CSX's right-of-way and have a minimum 23' vertical clearance above top of rail.
- All new undergrade bridges must have a ballast deck.
- MSE walls are prohibited on or adjacent to CSX property.
- Vehicular Clearance signage for clearance under CSX bridges is the responsibility of the road authority, not CSX.

General Guidelines

- All bridge projects over or under CSX shall be governed by the appropriate criteria found in the appendices. This includes but is not limited to replacements, new construction, substructure modifications and/or repairs, superstructure replacement or repair, and deck replacement or overlay.

- Temporary and final drainage plans must be approved by CSX.

- No drainage will be directed to CSX right of way.

- CSX's access to its property must be maintained.

- Plans must show all tracks and horizontal and vertical track clearances for both the existing conditions and the proposed project property or right-of-way lines.

- Bridge demolition criteria are found in the Overhead Bridge Criteria in the appendices of this manual.

- Upon completion of construction, a full set of electronic as-built drawings, showing actual measured vertical and horizontal clearances, shall be furnished to CSX.

PARALLEL ROAD CONSTRUCTION

Overview

In the interest of public safety, parallel public roads shall be located off CSX property. Parallel roads involving intersections with existing or proposed highways where public or private crossings are present should be aligned to provide sufficient distance from the crossing for the largest vehicle (design vehicle) permitted to use the road to stop between the railroad and the parallel road traffic control signs, markings, and warning devices without interfering with railroad operations, obstructing or preventing the operation of traffic control devices or obstructing the crossing in any manner.

Key Points

- Proposed parallel public roads shall be located off CSX property.
- Safety at existing highway-rail grade crossings must be considered and not adversely impacted.
- No additional drainage may be directed onto railroad property.
- CSX's access to its property must not be impeded.
- Construction may result in the need for alterations to crossing warning systems or facilities.

General Guidelines

The design of highways, highway intersection, and configuration of highway-rail grade crossings is the responsibility of the highway agency. Drainage for highway runoff, the railroad corridor, and adjacent property must be designed to reduce or maintain existing railroad drainage and to prevent standing water and potential erosion. Access for CSX equipment to the railroad property, structures, and track cannot be restricted or prevented.

Federal and State design manuals, the Manual of Uniform Traffic Control Devices (MUTCD) and additional recommended practices available in American Railway Engineering and Maintenance of Way Association manuals (AREMA) provide design information to be considered by the highway agency responsible for the project engineering. The table of contents of this document has additional information on the MUTCD and AREMA manuals and information

- Plans should include a typical section to show the relationship of the proposed work with respect to CSX property.

- Adjacent roadway projects shall comply with all aspects of the CSX Transportation Drainage Criteria.

- A railroad flagman or contracted construction inspector may be required at the project expense.

PAINTING AND CLEANING CSX BRIDGES TO IMPROVE APPEARANCE

Overview

Requests are occasionally made by outside parties for various beautification projects, including painting of overhead and undergrade bridges. These requests are considered on a case-by-case basis by CSX. The cost of painting and future aesthetic maintenance will be the responsibility of the project sponsor proposing to paint the CSX bridge. CSX will make every effort to cooperate, consistent with maintaining the safety of the public and the safe operation of the railroad.

Key Points

- CSX understands the desire of communities to improve the appearance of bridges and other structures. Safety of CSX employees, the general public and neighbors restrict some alternatives for bridge appearance improvement.
- CSX may permit others to paint CSX bridges if labor agreement, technical and responsibility requirements are resolved.
- Any surface preparation methods must follow all applicable environmental guidelines and must be approved in advance by CSX.
- CSX will not accept proposals to attach signage to CSX bridges.
- A written request should be submitted to CSX's Public Projects Group to initiate consideration of such projects.
- CSX must approve all proposed paint schemes and messaging.

Consideration of Bridge Painting Projects

Bridge painting proposals must be reviewed and approved by CSX to ensure compliance with safety and environmental regulations, CSX specifications, and to ensure that the proposal will not impact CSX's property or operations.

- CSX will require an agreement for all bridge painting proposals.
- A public agency must be a party to the agreement.
- CSX will incur no costs or liabilities as a result of the project.
- The public agency or its designee will be responsible for maintenance of the painted surfaces, including aesthetic damage caused by highway vehicles and vandalism.
- A railroad flagman will be required at the project expense.

Submission of Project Requests

A written request by the party wishing to undertake such projects should be forwarded to CSX's Public Projects Group for handling. The request should include information about the situation and the project objectives to assist CSX with completion of the review. The following information should be included:

- The project sponsor and public agency that will execute appropriate agreements for implementation as well as future maintenance of the painted surfaces.
- Paint specifications that meet CSX standards and methods for surface preparation, cleanup, and paint application.
- Qualifications and experience of the painting contractor. CSX will accept state qualified bridge painting contractors working for the responsible agency or company.
- The materials removed during the surface preparation must not impact the surrounding area including ground, water, or air. Materials must not be stored on CSX property.
- Control of paint overspray and vapors during application. The work must be done complying with appropriate regulations and over spray controlled to prevent damage to adjacent property and vehicles in the area.
- Containment system, clean up and disposal of all paint and other material removed from the bridge. The clean-up and disposal of material from the surface preparation for painting and actual painting must comply with all appropriate regulations.
- Pictures and conceptual drawing should be submitted with the initial request from the community to simplify the initial review and comment by CSX.
- Work site safety plan including keeping all personnel away from the tracks and fall protection measures where required.

Additional specifications are available upon request. Important environmental information is included in the Appendix titled "Soil and Water Management Policy."

CLEANING AND PAINTING OF BRIDGES OVER CSX

Overview

All work over CSX has the potential to impact CSX property and rail operations. CSX will review bridge painting and cleaning projects to ensure environmental and engineering standards are met. This review, flagging protection and construction monitoring costs will be paid by the project sponsor.

Key Points

- CSX understands that maintenance of bridges over CSX may include cleaning and painting. The safety of CSX employees, the general public, and the project sponsor's contractors is of paramount importance to CSX.
- A written request should be submitted to CSX's Public Projects Group to initiate this type of project. The request will be reviewed for safety considerations and compliance with CSX engineering and environmental standards.
- An agreement is required to accommodate engineering, review of plans, flagging, right-of-entry, and payment of CSX incurred costs.
- Any damage or required repair from painting operations shall be at the outside party's expense.

Requirements for Initiating and Implementing Bridge Cleaning and Painting

A Preliminary Engineering agreement is required to cover CSX's review of the project and preparation of a cost estimate and construction agreement.

To ensure safety, a railroad employee flagman must be present to control railroad operations in the area during the planned work.

A written request by the party wishing to undertake such projects should be forwarded to CSX's Public Projects Group for handling. The request should include information about the location and the project objectives to assist CSX with completion of the review. The following information should be included:

- The project sponsor and appropriate public agency that will execute appropriate agreements for implementation as well as future maintenance of the painted surfaces.
- Qualifications and experience of the painting contractor. CSX will accept state qualified bridge painting contractors working for the responsible agency or company.
- Containment system, clean up and disposal of all paint and other material removed from the bridge. The clean-up and disposal of material from the surface preparation for painting and actual painting must comply with all appropriate regulations.
- The materials removed during the surface preparation must not impact the surrounding area including ground, water, or air. Materials must not be stored on CSX property.
- Control of paint overspray and vapors during application. The work must be done complying with appropriate regulations and over spray controlled to prevent damage to adjacent property and vehicles in the area.
- Work site safety plan including keeping all personnel away from the tracks and fall protection measures where required.

Important environmental information is included in the Appendix titled "Soil and Water Management Policy."

PUBLIC ROAD CROSSING OPENINGS AND CLOSURES

Overview

CSX understands the importance of highway-rail grade crossings and their relevance to such priorities as economic development, emergency vehicle access and other growth opportunities in the communities through which we operate. Because of the safety concerns associated with highway-rail grade crossings, however, every effort must be made to obtain alternative access or additional capacity using grade separations, or by other roads leading to existing crossings.

Key Points

- Both federal and state government policies discourage the creation of new highway-rail grade crossings. To enhance highway-rail grade crossing safety, CSX endorses the United States Department of Transportation's goal of reducing the number of at-grade crossings through consolidation, elimination, grade separation and restriction of the number of new crossings installed.
- Grade separated structures are the best alternative to add new roads or additional highway capacity.
- CSX and state and federal agencies have worked with many communities to develop and implement projects that improve highway traffic flow without the creation of new highway-rail grade crossings.
- CSX, the Federal Railroad Administration (FRA), and state agencies encourage communities to consider all alternatives before planning to create new grade crossings and encourage closure of existing grade crossings where possible.
- CSX may provide incentive payments for crossing closures.
- To comply with and in support of the federal initiative to reduce crossings, CSX requires the community to identify three comparable active grade crossings to be closed for each new grade crossing.
- New crossings, if approved, shall be maintained at the appropriate agency's expense.

Crossing Closure Incentive Program

Eliminating crossings is a goal of CSX, states and the Federal Railroad Administration (FRA). Likewise, the Federal Highway Administration (FHWA) Railroad-Highway Grade Crossing Handbook acknowledges that the first alternative that should always be considered for a highway-rail at-grade crossing is elimination. Elimination of a crossing provides the highest level of crossing safety because the point of intersection between highway and railroad is removed. Closing adjacent crossings simplifies the design, installation and operation of highway-rail grade crossing warning systems. To help ensure the success of this effort, CSX may provide incentive payments for the closure of public crossings.

Considerations for Crossing Openings and Closures

The addition of any grade crossing brings the potential for incidents involving trains and motor vehicles. For this reason, both federal and state government policies discourage the creation of new grade crossings. CSX, other railroads, the United States Department of Transportation and most states encourage communities to carefully consider all alternatives, including grade separations (crossings that go over or under railroad tracks), as opposed to the creation of new at-grade crossings. The cost of a grade separation should not outweigh the enhanced safety it would provide for motorists.

CSX, the FRA and other railroads actively participate in programs such as Operation Lifesaver, an initiative dedicated to educating the public on the importance of practicing safe driving procedures at grade crossings. For more information about crossing safety, visit: http://www.beyondourrails.org/safety

Before agreeing to the establishment of a new crossing, CSX expects communities to engage in a study with the purpose of identifying existing redundant public crossings for closure. To comply with and in support of the federal initiative to reduce grade crossings, CSX requires that the community identify the closure of three or more comparable active public at-grade crossings.

As discussed above, the appropriate public authority will be expected to reimburse CSX for its cost of design, installation and future maintenance of the crossing.

Policies and Procedures to Guide New Crossing Requests:

The project sponsor requesting a new crossing or seeking to convert a private crossing to a public crossing will be asked to prepare a written request, presenting the following information:

1. A description of the proposed highway project, including proposed passive or active traffic control devices, and the need for preemption and/or interconnection with traffic signals, together with a scale drawing or sketch of the proposed highway and vicinity.

2. Expected Annual Average Daily Traffic (AADT) and proposed vehicular speed limit, photographs, aerial map.

3. A detailed explanation of the necessity of the crossing.

4. Identify at-grade crossings to be closed. Include their vehicular speed limit, AADT, and traffic type.

5. The determination by the highway or regulatory authority of the need for passive or active traffic control devices and other safety treatments (i.e., signage, roadway medians, etc.), as selected by the highway authority consistent with applicable federal and state MUTCD guidelines and requirements.

6. A plan to satisfy any appropriate regulatory authority's requirements, procedures and approval. The project sponsor should coordinate with all applicable agencies (state, county, city, etc.) to ensure proper procedures are followed.

7. Provide CSX authorization to incur costs for its Preliminary Engineering to review the crossing request (whether or not it is approved), design and construction expenses, and for the ongoing maintenance of the crossing surface and related grade crossing warning devices.

CSX will review the request for a new crossing and inform the project sponsor whether or not the new crossing is approved. CSX may deny a new crossing request due to safety or operational concerns.

BICYCLE/PEDESTRIAN PATHWAYS AND MULTI-USE TRAILS

Overview

CSX recognizes that communities often wish to establish recreational pathways and trails in the proximity of active railroad lines. While CSX will work with communities to accommodate such requests, it is critical for project sponsors to recognize that CSX requirements must be met and safety precautions taken to protect the public and CSX employees. In addition, certain requests, such as pathway crossings at grade outside of existing highway easements, will not be permitted.

Key Points

- Private or public bicycle/pedestrian pathways and trails parallel to the tracks are not permitted on CSX property.
- CSX prefers grade-separated bicycle/pedestrian pathways and multi-use trails.
- Bicycle/pedestrian pathways and trails cannot cross tracks at grade outside of existing highway easements.
- Pedestrian safety is enhanced when pathways and sidewalks are designed such that they cross the tracks at as close to a right angle as practical.
- The highway agency's design must include safety measures for at-grade pathways and trails within existing highway easements. These measures should include, at a minimum, detectable warnings. Pathways and trails should not be wider than 5'. All pathways and trails that exceed 5' in width must include additional safety measures beyond detectable warnings.
- CSX will oppose condemnation proceedings aimed at recreational use of trackside property.
- New crossings, if approved, and alterations to existing crossings, shall be maintained at the appropriate agency's expense.

CSX objects to publicly accessible parks, pathways and trails constructed within fifty (50) feet of its existing and proposed tracks. The location of publicly accessible recreational areas at such proximity to CSX poses major safety concerns and places undue liability to CSX. Agency shall be solely liable for any damages which could be mitigated or avoided by adherence to this safety standard.

Agency shall also install, own, maintain and repair, at its sole cost and expense, permanent protective fencing where its property is opposite CSX's property. Fencing shall be in accordance with CSX's standards.

CSX Policy on Pathways and Trails Parallel to CSX Property

At CSX safety is paramount. CSX's policy is not to permit private or public parallel bicycle/pedestrian paths that come within the railroad's right-of-way. CSX will insist upon safety measures such as fencing and signage where such pathways or parks are established parallel to the railroad's right-of-way. The cost of installing, inspection and future maintenance are the responsibility of the trail sponsor or agency. CSX will oppose any attempt to establish recreational usage of CSX property through condemnation. Regardless of construction of pathways and trails, CSX reserves the right to use CSX right of way for operational necessities.

Pathways and Trails Crossing CSX Tracks and Right-of-Way

Bicycle/pedestrian pathways and trails cannot cross tracks at grade outside of existing highway easements. Grade separated pathway and trail crossings are preferred in all cases, and required when outside of an existing highway easement. Pathways and trails under existing railroad structures are discouraged and will only be allowed under special circumstances. Pathways and trails under existing railroad structures will require a canopy. The canopy shall allow CSX to inspect, maintain, or repair its structure and shall not be attached to the CSX structure. Please refer to the Trail Construction Under CSX Bridges, for additional information (located in appendices to this document). Pathways and trails over and under the railroad track shall have protective fencing.

Bicycle/pedestrian pathways and trails crossing at-grade within a highway easement must have appropriate signs and warning systems as determined by the responsible highway and/or regulatory agency. When designing new sidewalk grade crossings, placing the sidewalk outside of the area occupied by grade crossing traffic control devices for vehicular traffic is important. This includes making sure that the counterweights and support arms for the automatic gates for vehicular traffic do not obstruct the sidewalk when the gate is fully lowered.

All expenses associated with the design, installation and maintenance of the pathway/trail, including the costs of signs, crossing surfaces and warning systems associated with an at-grade crossing, will be paid by the project sponsor.

Chapter 8 Section D of the Manual of Uniform Traffic Control Devices (MUTCD) provides design information to be considered by the highway agency responsible for the project engineering. The table of contents of this document has additional information on the MUTCD manual.

CSX prosecutes trespassers and every precaution must be taken to ensure that the public remains clear of CSX's property.

QUIET ZONE PROPOSALS

Overview

CSX will fully comply with the 49 CFR 222, FRA Train Horn Rule (Rule), which provides requirements for the sounding of locomotive horns when approaching public highway-rail grade crossings. The Rule also provides guidance for conditions under which a public authority with jurisdiction over the roadway crossing CSX tracks may apply for and establish Quiet Zones. A Quiet Zone is a section of a rail line that contains one or more consecutive public crossings at which locomotive horns are not routinely sounded. (For full details on the rules, CSX recommends that communities either visit the FRA web site at www.fra.dot.gov or contact the FRA's Office of Safety at 202-493-6299).

Policy on Quiet Zones

The Rule clearly defines requirements that must be satisfied by the public authority requesting that a Quiet Zone be established or continued. CSX will expect the public authority to strictly comply with these requirements.

Key Points

- This section was developed as a guideline for communities that approach CSX in regards to the implementation of a Quiet Zone under the Federal Railroad Administration's (FRA) final rule on the use of locomotive horns at public highway-rail grade crossings (49 CFR Part 222, the "Rule"), and to ensure CSX's full compliance and cooperation with respect to the Rule.

- According to the FRA, the implementation of Quiet Zones – without appropriate safeguards and equipment – increases the risk of accidents at highway-rail grade crossings. In this context, CSX encourages communities considering whether to pursue the implementation of a Quiet Zone to take into account the installation of appropriate Supplemental Safety Measures ("SSMs"), as defined in the Rule, as well as the consolidation and/or closing of adjacent crossings, all of which will act as a safeguard to potentially reduce the risk of accidents at each crossing below the risk level that existed prior to the implementation of the Quiet Zone.

- Communities that wish to implement Quiet Zones will be required to strictly comply with the Rule.

- Pursuant to the Rule, notifications and/or applications to implement or continue Quiet Zones are to be made to the FRA and must involve all relevant state and local agencies, CSX, and any other rail carriers operating in the area.

- CSX requires prepayment for all work performed to design, implement, and maintain railroad facilities within Quiet Zones.

- CSX desires to be a good corporate citizen. CSX also places importance on the quality and timeliness of service to its customers and the communities it serves. As such, consistent with the Rule, CSX will seek to encourage communities requesting Quiet Zones to implement solutions and SSMs that optimally achieve safety while minimizing the impact on railroad operations.

Should SSMs or ASMs fall out of compliance, CSX will resume train horn until repairs are made.

Plans for proposed Quiet Zones shall conform to current MUTCD standards.

CSX has published a Quiet Zone Manual, located here: https://www.csx.com/index.cfm/library/files/about-us/property/quiet-zones/

Identification of the crossing and location

Each crossing has a unique DOT inventory identification number posted at the crossing. There is often more than one crossing on the same road. The crossing number (such as 123456A) must be used to identify the specific crossing in all communications with the railroad to reduce possible confusion about the specific location.

Preliminary Planning for Quiet Zones

Preliminary work by CSX personnel and/or its consultants is likely to be required in connection with the proposed new or continued Quiet Zone, including, but not limited to: updating crossing inventory information; attending meetings; participating, to the extent feasible, in diagnostic reviews of the public, private and pedestrian crossings in a proposed Quiet Zone; preparing and processing estimates covering the cost of work to be performed by CSX, if applicable; and processing necessary agreements. CSX will coordinate preliminary planning activities with each public authority pursuant to an initial agreement that will also provide for payment to CSX for services provided during development of Quiet Zones.

Getting Started: Process for Pursuing a Quiet Zone

1. Groups or individuals interested in Quiet Zones should first contact the public authority responsible for the highway where the Quiet Zone would be located. Public authorities should then contact the FRA for additional information on Quiet Zone requirements and procedures.

2. The public authority shall initiate contact with CSX to: crossingrequests@csx.com. Those making this contact will be furnished with the Quiet Zone policy and advised of the appropriate contact within the CSX Public Projects Group for the initial planning activities with CSX.

3. If the public authority decides to proceed with preliminary planning for a Quiet Zone, the public authority shall deposit funds with CSX for CSX's Quiet Zone related expenses. After this deposit is received, CSX will assist by providing, when required, DOT inventory information and attending diagnostic review meetings, to the extent schedules permit. CSX resources to attend these meetings are limited and thus CSX will seek flexibility in establishing meeting dates and times in order to permit CSX representatives to attend.

4. The preliminary planning for a Quiet Zone project should include a review of the following principles:

    a. CSX will cooperate and work in good faith with local communities and the appropriate public authority to provide all possible assistance in a manner that protects the safety of local citizens and their communities as well as CSX's employees.

    b. In accordance with the Rule, CSX's support of a Quiet Zone proposal will require the plan to meet very specific FRA measures and requirements, which in some cases, may be subject to FRA review, approval and on-going oversight. Accordingly, CSX retains the right to review and comment on the requests.

    c. CSX expects the involvement of the state DOT, FRA, and/or state regulatory authority in any diagnostic review of a public, private and pedestrian crossing in the Quiet Zone corridor being proposed.

    d. As discussed above, the appropriate public authority will be expected to reimburse CSX for its cost of design, installation and future maintenance of safety enhancements, including, but not limited to, its installation of Supplemental Safety Measures (SSMs) and Alternative Safety Measures (ASMs). As an example, CSX installs and maintains active warning systems at highway-rail grade crossings that may be modified or expanded for a Quiet Zone. Curbs, medians, pavement markings and other traffic control signs such as advance warning signs are installed and maintained by Public Authorities. The specific responsibilities are expected to be resolved during the preliminary planning for a Quiet Zone.

    e. If one or more SSMs or ASMs selected to be installed require work by CSX, a separate standard Preliminary Engineering Agreement will be required to cover CSX's engineering, review, handling, and estimate preparation connected with the proposed work. A separate Construction Agreement will be used for implementation of the projects. The cost of this work will be the responsibility of the requesting public authority.

    f. SSMs or ASMs installed and maintained by the public authority as described above are important parts of traffic control at each crossing. The public authority is responsible for periodic inspection and repair of these items.

5. Standard CSX Public Projects Group design and estimating procedures will be used for projects related to Quiet Zones.

6. Vehicle Loop Detection Circuitry will not be designed, installed, owned, or maintained by CSX.

7. Wayside Horn Systems are not authorized for use on CSX.

APPENDIX

CSX TRANSPORTATION

PRELIMINARY ENGINEERING AGREEMENT

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

PRELIMINARY ENGINEERING AGREEMENT

This Preliminary Engineering Agreement (this "Agreement") is made as of, 201, by and between CSX TRANSPORTATION, INC., a Virginia corporation with its principal place of business in Jacksonville, Florida ("CSX"), and [INSERT AGENCY NAME], a body corporate and political subdivision of the [INSERT STATE] ("Agency").

EXPLANATORY STATEMENT

1. Agency wishes to facilitate the development of the proposed [INSERT Project Description; eg: rehabilitation / repair of the Ridgeview Middle School Pedestrian Bridge Structure passing over CSX (DOT# 228 637B) in the vicinity of CSX milepost CD-6.15 on the Great Lakes Division, Columbus Subdivision, located in Columbus, Franklin County, Ohio] (the "Project").

2. Agency has requested that CSX proceed with certain necessary engineering and/or design services for the Project to facilitate the parties' consideration of the Project.

3. Subject to the approval of CSX, which approval may be withheld for any reason directly or indirectly related to safety or CSX operations, property, or facilities, the Project is to be constructed, if at all, at no cost to CSX, under a separate construction agreement to be executed by the parties at a future date.

NOW, THEREFORE, for and in consideration of the foregoing Explanatory Statement and other good and valuable consideration, the receipt and sufficiency of which are acknowledged by the parties, the parties agree as follows:

1. Scope of Work

1.1. Generally. The work to be done by CSX under this Agreement shall consist of: (i) the preparation or review and approval of preliminary and final engineering and design plans, specifications, drawings, agreements and other documents pertaining to the Project, (ii) the preparation of cost estimates for CSX's work in connection with the Project, and (iii) the review of construction cost estimates, site surveys, plats, legal descriptions, assessments, studies, easements, agreements and related construction documents submitted to CSXT by Agency for the Project (collectively, the "Engineering Work"). Engineering Work may also include office reviews, field reviews, attending hearings and meetings, and preparing correspondence, reports, and other documentation in connection with the Project. Nothing contained in this Agreement shall oblige CSX to perform work which, in CSX's opinion, is not relevant to CSX's participation in the Project.

1.2. Effect of CSX Approval or Preparation of Documents. By its review, approval or preparation of plans, specifications, drawings or other documents pursuant to this Agreement (collectively, the "Plans"), CSX signifies only that the Plans and the Project proposed to be constructed in accordance with the Plans satisfy CSX's requirements. CSX expressly disclaims all other representations and warranties in connection with the Plans, including, but not limited to, the integrity, suitability or fitness for the purposes of Agency or any other persons of such Plans or the Project constructed in accordance with the Plans.

2. Project Construction. Nothing contained in this Agreement shall be deemed to constitute CSX's approval of or consent to the construction of the Project, which approval or consent may be withheld for any reason directly or indirectly related to safety or CSX operations, property, or facilities. The Project if constructed is to be constructed, if at all, under a separate construction agreement to be executed by the parties at a future date.

3. Reimbursement of CSX Expenses.

3.1. Reimbursable Expenses. Agency shall reimburse CSX for all costs and expenses incurred by CSX in connection with the Engineering Work, including, without limitation: (i) all out of pocket expenses, (ii) travel and lodging expenses, (iii) telephone, facsimile, and mailing expenses, (iv) costs for equipment, tools, materials and supplies, (v) sums paid to consultants and subcontractors, and (vi) labor, together with labor overhead percentages established by CSX pursuant to applicable law (collectively, the "Reimbursable Expenses").

3.2. Estimate. CSX has estimated the total Reimbursable Expenses for the Project to be approximately $ [INSERT DOLLAR AMOUNT] (the "Estimate" as amended or revised). In the event CSX anticipates that actual Reimbursable Expenses may exceed such Estimate, it shall provide Agency with the revised Estimate of total Reimbursable Expenses for Agency's approval and confirmation that sufficient funds have been appropriated to cover the total Reimbursable Expenses as reflected in the revised Estimate. CSX may elect, by delivery of notice to Agency, to immediately cease all further Engineering Work, unless and until Agency provides such approval and confirmation.

3.3. Payment Terms.

3.3.1. Advance Payment in Full. Upon execution and delivery of this Agreement by Agency, Agency will deposit with CSX a sum equal to the Reimbursable Expenses, as shown by the Estimate. Agency shall pay CSX for Reimbursable Expenses in the amount set forth in CSX Schedule PA attached hereto, a copy of which shall accompany the advance payment. If CSX anticipates that it may incur Reimbursable Expenses in excess of the deposited amount, CSX will request an additional deposit equal to the then remaining Reimbursable Expenses which CSX estimates that it will incur. CSX shall request such additional deposit by delivery of invoices to Agency. Agency shall make such additional deposit within thirty (30) days following delivery of such invoice to Agency.

3.3.2. Following completion of all Engineering Work, CSX shall reconcile the total Reimbursable Expenses incurred by CSX against the total payments received from Agency and shall submit to Agency a final invoice if required. Agency shall pay to CSX the amount by which actual Reimbursable Expenses exceed total payments, as shown by the final invoice, within thirty (30) days following delivery to Agency of the final invoice. CSX will provide a refund of any unused deposits if the deposit exceeds the incurred Reimbursable Expenses for the Project.

3.3.3. In the event that Agency fails to pay CSX any sums due CSX under this Agreement: (i) Agency shall pay CSX interest at the lesser of 1.0% per month or the maximum rate of interest permitted by applicable law on the delinquent amount until paid in full; and (ii) CSX may elect, by delivery of notice to Agency: (A) to immediately cease all further work on the Project, unless and until Agency pays the entire delinquent sum, together with accrued interest; and/or (B) to terminate this Agreement.

3.4. Effect of Termination. Agency's obligation to pay CSX Reimbursable Expenses in accordance with this Section shall survive termination of this Agreement for any reason.

4. Appropriations. Agency represents to CSX that: (i) Agency has obtained appropriations sufficient to reimburse CSX for the Reimbursable Expenses encompassed by the initial Estimate; (ii) Agency shall use its best efforts to obtain appropriations necessary to cover Reimbursable Expenses encompassed by subsequent Estimates approved by Agency; and (iii) Agency shall promptly notify CSX in the event that Agency is unable to obtain such additional appropriations.

5. Termination.

5.1. By Agency. Agency may terminate this Agreement, for any reason, by delivery of notice to CSX. Such termination shall become effective upon the expiration of fifteen (15) calendar days following delivery of notice to CSX or such later date designated by the notice.

5.2. By CSX. CSX may terminate this Agreement (i) as provided pursuant to Section 3.3.3., or (ii) upon Agency's breach of any of the terms of, or its obligations under, this Agreement and such breach continues without cure for a period of ninety (90) days after written notification from CSX to Agency of such breach.

5.3. Consequences of Termination. If the Agreement is terminated by either party pursuant to this Section or any other provision of this Agreement, the parties understand that it may be impractical to immediately stop the Engineering Work. Accordingly, both parties agree that, in such instance a party may continue to perform Engineering Work until it has reached a point where it may reasonably and/or safely suspend the Engineering Work. Agency shall reimburse CSX pursuant to this Agreement for the Engineering Work performed, plus all costs reasonably incurred by CSX to discontinue the Engineering Work and all other costs of CSX incurred as a result of the Project up to the time of full suspension of the Engineering Work. Termination of this Agreement or Engineering Work on the Project, for any reason, shall not diminish or reduce Agency's obligation to pay CSX for Reimbursable Expenses incurred in accordance with this Agreement. In the event of the termination of this Agreement or the Engineering Work for any reason, CSX's only remaining obligation to Agency shall be to refund to Agency payments made to CSX in excess of Reimbursable Expenses in accordance with Section 2.

6. Subcontracts. CSX shall be permitted to engage outside consultants, counsel and subcontractors to perform all or any portion of the Engineering Work.

7. Notices. All notices, consents and approvals required or permitted by this Agreement shall be in writing and shall be deemed delivered (i) on the expiration of three (3) days following mailing by first class U.S. mail, (ii) on the next business day following mailing by a nationally recognized overnight carrier, or (iii) on the date of transmission, as evidenced by written confirmation of successful transmission, if by facsimile or other electronic transmission if sent on a business day (or if not sent on a business day, then on the next business day after the date sent), to the parties at the addresses set forth below, or such other addresses as either party may designate by delivery of prior notice to the other party:

If to CSX: CSX Transportation, Inc.
500 Water Street, J301 Jacksonville, Florida 32202
Attention: Director Project Management – Public Projects

If to Agency: _____
_____
_____
_____

8. Entire Agreement. This Agreement embodies the entire understanding of the parties, may not be waived or modified except in a writing signed by authorized representatives of both parties, and supersedes all prior or contemporaneous written or oral understandings, agreements or negotiations regarding its subject matter. In the event of any inconsistency between this Agreement and the Exhibits, the more specific terms of the Exhibits shall be deemed controlling.

9. Waiver. If either party fails to enforce its respective rights under this Agreement, or fails to insist upon the performance of the other party's obligations hereunder, such failure shall not be construed as a permanent waiver of any rights or obligations in this Agreement.

10. Assignment. CSX may assign this Agreement and all rights and obligations herein to a successor in interest, parent company, affiliate, or future affiliate. Upon assignment of this Agreement by CSX and the assumption by CSX's assignee of CSX's obligations under this Agreement, CSX shall have no further obligations under this Agreement. Agency shall not assign its rights or obligations under this Agreement without CSX's prior written consent, which consent may be withheld for any reason.

11. Applicable Law. This Agreement shall be governed by the laws of the [INSERT STATE] , exclusive of its choice of law rules. The parties further agree that the venue of all legal and equitable proceedings related to disputes under this Agreement shall be situated in Duval County, Florida, and the parties agree to submit to the personal jurisdiction of any State or Federal court situated in Duval County, Florida.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed in duplicate, each by its duly authorized officers, as of the date of this Agreement.

[INSERT AGENCY NAME]

By: _____

Print Name: _____

Title: _____

CSX TRANSPORTATION, INC.

By: _____
Will Roseborough
Director, Project Development and Public Projects

CSX SCHEDULE PA
(Advance Payment – Preliminary Engineering Agreement)

PAYMENT SUBMISSION FORM

* * * *

APPENDIX

CSX TRANSPORTATION

CONSTRUCTION AGREEMENT

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

CONSTRUCTION AGREEMENT

This Construction Agreement ("Agreement") is made as of _____, 201____, by and between CSX TRANSPORTATION, INC., a Virginia corporation with its principal place of business in Jacksonville, Florida ("CSX"), and [INSERT Name of Public Agency], a body corporate and political subdivision of the State of (INSERT Name of State] ("Agency").

EXPLANATORY STATEMENT

1. Agency has proposed to construct, or to cause to be constructed, [INSERT Project Description; eg: rehabilitation / repair of the Ridgeview Middle School Pedestrian Bridge Structure passing over CSX (DOT# 228 637B) in the vicinity of CSX milepost CD-6.15 on the Great Lakes Division, Columbus Subdivision, located in Columbus, Franklin County, Ohio] (the "Project").

2. Agency has obtained, or will obtain, all authorizations, permits and approvals from all local, state and federal agencies (including Agency), and their respective governing bodies and regulatory agencies, necessary to proceed with the Project and to appropriate all funds necessary to construct the Project.

3. Agency acknowledges that: (i) by entering into this Agreement, CSX will provide services and accommodations to promote public interest in this Project, without profit or other economic inducement typical of other Agency contractors;
(ii) neither CSX nor its affiliates (including their respective directors, officers, employees or agents) will incur any costs, expenses, losses or liabilities in excess of payments made to CSX, by or on behalf of Agency or its contractors, pursuant to this Agreement; and
(iii) CSX retains the paramount right to regulate all activities affecting its property and operations.

4. It is the purpose of this Agreement to provide for the terms and conditions upon which the Project may proceed.

NOW, THEREFORE, in consideration of the foregoing Explanatory Statement and other good and valuable consideration, the receipt and sufficiency of which are acknowledged by the parties, the parties agree as follows:

1. Project Plans and Specifications

1.1 Preparation and Approval. Pursuant to Exhibit A of this Agreement, all plans, specifications, drawings and other documents necessary or appropriate to the design and construction of the Project shall be prepared, at Agency's sole cost and expense, by Agency or CSX or their respective contractors. Project plans, specifications and drawings prepared by or on behalf of Agency shall be subject, at CSX's election, to the review and approval of CSX. Such plans, specifications and drawings, as prepared or approved by CSX, are referred to as the "Plans", and shall be incorporated and deemed a part of this Agreement. Plans prepared or submitted to and approved by CSX as of the date of this Agreement are set forth in Exhibit B to this Agreement.

1.2 Effect of CSX Approval or Preparation of Plans. By its review, approval or preparation of Plans pursuant to this Agreement, CSX signifies only that such Plans and improvements constructed in accordance with such Plans satisfy CSX's requirements. CSX expressly disclaims all other representations and warranties in connection with the Plans, including, but not limited to, the integrity, suitability or fitness for the purposes of Agency or any other persons of the Plans or improvements constructed in accordance with the Plans.

1.3 Compliance with Plans. The Project shall be constructed in accordance with the Plans.

2. Allocation and Conduct Of Work

Work in connection with the Project shall be allocated and conducted as follows:

2.1 CSX Work. Subject to timely payment of Reimbursable Expenses as provided by Section 4, CSX shall provide, or cause to be provided, the services as set forth by Exhibit A to this Agreement. Agency agrees that CSX shall provide all services that CSX deems necessary or appropriate (whether or not specified by Exhibit A) to preserve and maintain its property and operations, without impairment or exposure to liability of any kind and in compliance with all applicable federal, state and local regulations and CSX's contractual obligations, including, but not limited to, CSX's existing or proposed third party agreements and collective bargaining agreements.

2.2 Agency Work. Agency shall perform, or cause to be performed, all work as set forth by Exhibit A, at Agency's sole cost and expense.

2.3 Conduct of Work. CSX shall commence its work under this Agreement following: (i) delivery to CSX of a notice to proceed from Agency; (ii) payment of Reimbursable Expenses (as provided by Section 4.1) as required by CSX prior to the commencement of work by CSX; (iii) issuance of all permits, approvals and authorizations necessary or appropriate for such work; and (iv) delivery of proof of insurance acceptable to CSX, as required by Section 9. The initiation of any services by CSX pursuant to this Agreement, including, but not limited to, the issuance of purchase orders or bids for materials or services, shall constitute commencement of work for the purposes of this Section. The parties intend that all work by CSX or on CSX property shall conclude no later than [INSERT DATE], unless the parties mutually agree to extend such date.

3. Special Provisions Agency shall observe and abide by, and shall require its contractors ("Contractors") to observe and abide by the terms, conditions and provisions set forth in Exhibit C to this Agreement (the "Special Provisions"). To the extent that Agency performs Project work itself, Agency shall be deemed a Contractor for purposes of this Agreement. Agency further agrees that, prior to the commencement of Project work by any third party Contractor, such Contractor shall execute and deliver to CSX Schedule I to this Agreement to acknowledge Contractor's agreement to observe and abide by the terms and conditions of this Agreement.

4. Cost Of Project and Reimbursement Procedures

4.1 Reimbursable Expenses. Agency shall reimburse CSX for all costs and expenses incurred by CSX in connection with the Project, including, without limitation: (1) all out of pocket expenses, (2) travel and lodging expenses, (3) telephone, facsimile, and mailing expenses, (4) costs for equipment, tools, materials and supplies, (5) sums paid to CSX's consultants and subcontractors, and (6) CSX labor in connection with the Project, together with CSX labor overhead percentages established by CSX pursuant to applicable law (collectively, "Reimbursable Expenses"). Reimbursable Expenses shall also include expenses incurred by CSX prior to the date of this Agreement to the extent identified by the Estimate provided pursuant to Section 4.2.

4.2 Estimate. CSX has estimated the total Reimbursable Expenses for the Project as shown on Exhibit D (the "Estimate", as amended or revised). In the event CSX anticipates that actual Reimbursable Expenses for the Project may exceed such Estimate, it shall provide Agency with the revised Estimate of the total Reimbursable Expenses, together with a revised Payment Schedule (as defined by Section 4.3.1), for Agency's approval and confirmation that sufficient funds have been appropriated to cover the total Reimbursable Expenses of such revised Estimate. CSX may elect, by delivery of notice to Agency, to immediately cease all further work on the Project, unless and until Agency provides such approval and confirmation.

4.3 Payment Terms.

4.3.1 Agency shall pay CSX for Reimbursable Expenses in the amounts and on the dates set forth in the Payment Schedule as shown on Exhibit E (the "Payment Schedule", as revised pursuant to Section 4.2). CSX agrees to submit invoices to Agency for such amounts and Agency shall remit payment to CSX at the later of thirty (30) days following delivery of each such invoice to Agency or, the payment date (if any) set forth in the Payment Schedule.

4.3.2 Following completion of the Project, CSX shall submit to Agency a final invoice that reconciles the total Reimbursable Expenses incurred by CSX against the total payments received from Agency. Agency shall pay to CSX the amount by which Reimbursable Expenses exceed total payments as shown by the final invoice, within thirty (30) days following delivery of such invoice to Agency. In the event that the payments received by CSX from Agency exceed the Reimbursable Expenses, CSX shall remit such excess to Agency.

4.3.3 In the event that Agency fails to pay CSX any sums due CSX under this Agreement: (i) Agency shall pay CSX interest at the lesser of 1.0% per month or the maximum rate of interest permitted by applicable law on the delinquent amount until paid in full; and (ii) CSX may elect, by delivery of notice to Agency: (A) to immediately cease all further work on the Project, unless and until Agency pays the entire delinquent sum, together with accrued interest; and/or (B) to terminate this Agreement.

4.3.4 All invoices from CSX shall be delivered to Agency in accordance with Section 16 of this Agreement. All payments by Agency to CSX shall be made by certified check and mailed to the following address or such other address as designated by CSX's notice to Agency:

CSX Transportation, Inc.
P.O. Box 530192
Atlanta, GA 30353-0192

4.4 Effect of Termination. Agency's obligation to pay to CSX Reimbursable Expenses in accordance with Section 4 shall survive termination of this Agreement for any reason.

5. Appropriations Agency represents to CSX that: (i) Agency has appropriated funds sufficient to reimburse CSX for the Reimbursable Expenses encompassed by the Estimate attached as Exhibit D; (ii) Agency shall use its best efforts to obtain appropriations necessary to cover Reimbursable Expenses encompassed by subsequent Estimates approved by Agency; and (iii) Agency shall promptly notify CSX in the event that Agency is unable to obtain such appropriations.

6. Easements and Licenses

6.1 Agency Obligation. Agency shall acquire all necessary licenses, permits and easements required for the Project.

6.2 Temporary Construction Licenses. Insofar as it has the right to do so, CSX hereby grants Agency a nonexclusive license to access and cross CSX's property, to the extent necessary for the construction of the Project (excluding ingress or egress over public grade crossings), along such routes and upon such terms as may be defined and imposed by CSX and such temporary construction easements as may be designated on the Plans approved by CSX.

6.3 Temporary Construction Easements. CSXT may grant without warranty to Agency, if required, a temporary non-exclusive easement for access to the extent necessary for the project on terms and conditions and at a price acceptable to the parties.

6.4 Maintenance Agreement. Contemporaneous with the execution of this Agreement, CSXT and Agency have executed that certain Maintenance Agreement providing for Agency's ongoing use maintenance, repair, renewal and removal of the Project.

6.5 Permanent Easements. Insofar as it has the right to do so, CSXT shall grant, without warranty to Agency, easements for the use and maintenance (in accordance with the provisions of the Maintenance Agreement described in 6.4) of the Project wholly or partly on CSXT property as shown on the Plans approved by CSXT, if any, on terms and conditions and at a price acceptable to both parties. Upon request by CSXT, Agency shall furnish to CSXT descriptions and plat plans for the easements.

7. Permits At its sole cost and expense, Agency shall procure all permits and approvals required by any federal, state, or local governments or governmental agencies for the construction, maintenance and use of the Project, copies of which shall be provided to CSX.

8. Termination

8.1 By Agency. For any reason, Agency may, as its sole remedy, terminate this Agreement by delivery of notice to CSX. Agency shall not be entitled to otherwise pursue claims for consequential, direct, indirect or incidental damages or lost profits as a consequence of CSX's default or termination of this Agreement or Work on the Project by either party.

8.2 By CSX. In addition to the other rights and remedies available to CSX under this Agreement, CSX may terminate this Agreement by delivery of notice to Agency in the event Agency or its Contractors fail to observe the terms or conditions of this Agreement and such failure continues more than ten (10) business days following delivery of notice of such failure by CSX to Agency.

8.3 Consequences of Termination. If the Agreement is terminated by either party pursuant to this Section or any other provision of this Agreement, the parties understand that it may be impractical for them to immediately stop the Work. Accordingly, they agree that, in such instance a party may continue to perform Work until it has reached a point where it may reasonably and safely suspend the Work. Agency shall reimburse CSX pursuant to this Agreement for the Work performed, plus all costs reasonably incurred by CSX to discontinue the Work and protect the Work upon full suspension of the same, the cost of returning CSX's property to its former condition, and all other costs of CSX incurred as a result of the Project up to the time of full suspension of the Work. Termination of this Agreement or Work on the Project, for any reason, shall not diminish or reduce Agency's obligation to pay CSX for Reimbursable Expenses incurred in accordance with this Agreement. In the event of the termination of this Agreement or the Work for any reason, CSX's only remaining obligation to Agency shall be to refund to Agency payments made to CSX in excess of Reimbursable Expenses in accordance with Section 4.

9. Insurance In addition to the insurance that Agency requires of its Contractor, Agency shall acquire or require its Contractor to purchase and maintain insurance in compliance with CSX's insurance requirements attached to this Agreement as Exhibit F. Neither Agency nor Contractor shall commence work on the Project until such policy or policies have been submitted to and approved by CSX's Risk Management Department.

10. Ownership and Maintenance
[SELECT ONE OF THE FOLLOWING ALTERNATE PROVISIONS:]
- Railroad Bridge

10.1 By Agency. Agency shall own and, without cost to CSX, shall maintain, repair, replace and renew, or cause same to be done, in good condition and repair to CSX's satisfaction, the railroad bridge structure (excluding only those components which CSX owns and has agreed to maintain, repair and replace pursuant to this Section), the highway underpass structure, the roadway surfacing, the roadway slopes, the retaining walls, the roadway drainage facilities, sidewalks and lighting. In the event that Agency fails to properly maintain such structures and improvements, and such failure, in the opinion of CSX, jeopardizes the safe and efficient operation of its property, CSX shall be entitled to remedy such failure and recover from Agency the costs incurred by CSX in doing so.

10.2 By CSX. CSX shall own and, at its sole cost and expense, maintain, repair, replace and renew its tracks, ballast and approach embankments, and railroad signal and communication systems, and CSX shall be permitted to install, maintain, repair and replace other utilities, facilities and cable, or cause same to be done, as CSX authorizes from time to time on or within the railroad bridge structure.

10.3 Alterations. Agency shall not undertake any alteration, modification or expansion of the Project, without the prior approval of CSX, which may be withheld for any reason, and the execution of such agreements as CSX may require. CSX may effectuate any improvements to that portion of the Project on which CSX operates its rail line, without securing the prior approval of the Agency so long as such improvements will not have a negative impact on highway traffic using the highway underpass.

- Highway Bridge

10.1 By Agency. Agency shall own and, without cost to CSX, maintain, repair, replace and renew, or cause same to be done, in good condition and repair to CSX's satisfaction, the highway overpass structure, the roadway surfacing, the roadway slopes, the retaining walls, and the highway drainage facilities. In the event that Agency fails to properly maintain such structures and improvements and such failure, in the opinion of CSX, jeopardizes the safe and efficient operation of its property, CSX shall be entitled to remedy such failure and recover from Agency the costs incurred by CSX in doing so. Upon the cessation of use of the Project by Agency, Agency shall remove the bridge structure and restore CSX's property to its original condition, at Agency's sole cost and expense, to CSX's satisfaction.

10.2 Alterations. Agency shall not undertake any alteration, modification or expansion of the Project, without the prior approval of CSX, which may be withheld for any reason, and the execution of such agreements as CSX may require.

- At Grade Crossings

10.1 By Agency. Agency shall maintain and repair, at its sole cost and expense, all parts comprising the permanent aspects of the Project, as shown by the Plans, consisting of roadway pavement up to the outer ends of the railroad cross ties, sidewalks, guardrails, and curbs, in good and safe condition to CSX's satisfaction. In the event Agency fails to do so after reasonable notice from CSX (unless an emergency condition exists or is imminent in the opinion of CSX that requires immediate action), CSX may perform such maintenance and repair, at Agency's sole cost and expense.

10.2 By CSX. CSX shall maintain and repair the crossing surface between the ends of its cross ties and its signal facilities at the crossing, at Agency's sole cost and expense.

10.3 Alterations. Agency shall not undertake any alteration, modification or expansion of the Project, without the prior written approval of CSX, which may be withheld for any reason, and the execution of such agreements as CSX may require. CSX may undertake alterations of its property, track or facilities and shall be reimbursed by Agency for the expenses incurred by CSX with respect to the removal and restoration of the crossing in connections with such alteration.

- Other Improvements

10.1 By Agency. Agency shall own, maintain and repair, at its sole cost and expense, all parts comprising the permanent aspects of the Project, as shown by the Plans. In the event Agency fails to do so after reasonable notice from CSX (no more than thirty (30) days, unless an emergency condition exists or is imminent in the opinion of CSX, that requires immediate action), CSX may perform such maintenance and repair, at Agency's sole cost and expense. Upon the cessation of use of the Project by Agency, Agency shall remove the structure and restore CSX's property to its original condition, at Agency's sole cost and expense, to CSX's satisfaction.

10.2 Alterations. Agency shall not undertake any alteration, modification or expansion of the Project, without the prior approval of CSX, which may be withheld for any reason, and the execution of such agreements as CSX may require.

11. Indemnification

11.1 Generally. To the maximum extent permitted by applicable law, Agency and its Contractors shall indemnify, defend, and hold CSX and its affiliates harmless from and against all claims, demands, payments, suits, actions, judgments, settlements, and damages of every nature, degree, and kind (including direct, indirect, consequential, incidental, and punitive damages), for any injury to or death to any person(s) (including, but not limited to the employees of CSX, its affiliates, Agency or its Contractors), for the loss of or damage to any property whatsoever (including but not limited to property owned by or in the care, custody, or control of CSX, its affiliates, Agency or its Contractors, and environmental damages and any related remediation brought or recovered against CSX and its affiliates), arising directly or indirectly from the negligence, recklessness or intentional wrongful misconduct of the Contractors, Agency, and their respective agents, employees, invitees, contractors, or its contractors' agents, employees or invitees in the performance of work in connection with the Project or activities incidental thereto, or from their presence on or about CSX's property. The foregoing indemnification obligation shall not be limited to the insurance coverage required by this Agreement, except to the extent required by law or otherwise expressly provided by this Agreement.

11.2 Compliance with Laws. Agency shall comply, and shall require its Contractors to comply, with any federal, state, or local laws, statutes, codes, ordinances, rules, and regulations applicable to its construction and maintenance of the Project. Agency's Contractors shall indemnify, defend, and hold CSX and its affiliates harmless with respect to any fines, penalties, liabilities, or other consequences arising from breaches of this Section.

11.3 "CSX Affiliates". For the purpose of this Section 11, CSX's affiliates include CSX Corporation and all entities, directly or indirectly, owned or controlled by or under common control of CSX or CSX Corporation and their respective officers, directors, employees and agents.

11.4 Notice of Incidents. Agency and its Contractor shall notify CSX promptly of any loss, damage, injury or death arising out of or in connection with the Project work.

11.5 Survival. The provisions of this Section 11 shall survive the termination or expiration of this Agreement.

12. Independent Contractor The parties agree that neither Agency nor its Contractors shall be deemed either agents or independent contractors of CSX. Except as otherwise provided by this Agreement, CSX shall exercise no control whatsoever over the employment, discharge, compensation of, or services rendered by Agency or Agency's Contractors, or the construction practices, procedures, and professional judgment employed by Agency or its Contractor to complete the Project. Notwithstanding the foregoing, this Section 12 shall in no way affect the absolute authority of CSX to prohibit Agency or its

Contractors or anyone from entering CSX's property, or to require the removal of any person from its property, if it determines, in its sole discretion, that such person is not acting in a safe manner or that actual or potential hazards in, on or about the Project exist.

13. "Entire Agreement" This Agreement embodies the entire understanding of the parties, may not be waived or modified except in a writing signed by authorized representatives of both parties, and supersedes all prior or contemporaneous written or oral understandings, agreements or negotiations regarding its subject matter. In the event of any inconsistency between this Agreement and the Exhibits, the more specific terms of the Exhibits shall be deemed controlling.

14. Waiver If either party fails to enforce its respective rights under this Agreement, or fails to insist upon the performance of the other party's obligations hereunder, such failure shall not be construed as a permanent waiver of any rights or obligations in this Agreement.

15. Assignment CSX may assign this Agreement and all rights and obligations herein to a successor in interest, parent company, affiliate, or future affiliate. Upon assignment of this Agreement by CSX and the assumption of CSX's assignee of CSX's obligations under this Agreement, CSX shall have no further obligation under this Agreement. Agency shall not assign its rights or obligations under this Agreement without CSX's prior consent, which consent may be withheld for any reason.

16. Notices All notices, consents and approvals required or permitted by this Agreement shall be in writing and shall be deemed delivered upon personal delivery, upon the expiration of three (3) days following mailing by first class U.S. mail, or upon the next business day following mailing by a nationally recognized overnight carrier, to the parties at the addresses set forth below, or such other addresses as either party may designate by delivery of prior notice to the other party:

If to CSX: CSX Transportation, Inc.
500 Water Street, J301 Jacksonville, Florida 32202
Attention: Director Project Management – Public Projects

If to Agency: _____
_____
_____
_____

17. Severability The parties agree that if any part, term or provision of this Agreement is held to be illegal, unenforceable or in conflict with any applicable federal, state, or local law or regulation, such part, term or provision shall be severable, with the remainder of the Agreement remaining valid and enforceable.

18. Applicable Law This Agreement shall be governed by the laws of the State of [INSERT STATE OF PROJECT LOCATION], exclusive of its choice of law rules. The parties further agree that the venue of all legal and equitable proceedings related to disputes under this Agreement shall be situated in Duval County, Florida, and the parties agree to submit to the personal jurisdiction of any State or Federal court situated in Duval County, Florida.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed in duplicate, each by its duly authorized officers, as of the date of this Agreement.

[INSERT NAME OF AGENCY]
By: _____
Print Name: _____
Title: _____

CSX TRANSPORTATION, INC.
By: _____
Will Roseborough
Director, Project Development and Public Projects

EXHIBIT A

ALLOCATION OF WORK

Subject to Section 2.1, work to be performed in connection with the Project is allocated as follows:

A. Agency shall let by contract to its Contractors:

1. [INSERT DESCRIPTION OF WORK]

B. CSX shall perform or cause to be performed:

1. Preliminary engineering services.
2. Changes in communication and signal lines.
3. Flagging services and other protective services and devices as may be necessary.
4. Construction engineering and inspection to protect the interests of CSX.

EXHIBIT B
PLANS AND SPECIFICATIONS

Plans, Specifications and Drawings:

As of the date of this Agreement, the following plans, specifications and drawings have been submitted by Agency to CSX for its review and approval:

[IDENTIFY PLANS AND SPECIFICATIONS BY DATE, PREPARER, TITLE, PROJECT NUMBER, ETC.]

SHEET	DESCRIPTION	PREPARER	DATE
1 of			

EXHIBIT C

CSX SPECIAL PROVISIONS

DEFINITIONS:

As used in these Special Provisions, all capitalized terms shall have the meanings ascribed to them by the Agreement, and the following terms shall have the meanings ascribed to them below:

"CSX" shall mean CSX Transportation, Inc., its successors and assigns.

"CSX Representative" shall mean the authorized representative of CSX Transportation, Inc.

"Agreement" shall mean the Agreement between CSX and Agency, as amended from time to time.

"Agency" shall mean the [INSERT NAME OF AGENCY].

"Agency Representative" shall mean the authorized representative of [INSERT NAME OF AGENCY].

"Contractor" shall have the meaning ascribed to such term by the Agreement.

"Work" shall mean the Project as described in the Agreement.

I. AUTHORITY OF CSX ENGINEER

The CSX Representative shall have final authority in all matters affecting the safe maintenance of CSX operations and CSX property, and his or her approval shall be obtained by the Agency or its Contractor for methods of construction to avoid interference with CSX operations and CSX property and all other matters contemplated by the Agreement and these Special Provisions.

II. INTERFERENCE WITH CSX OPERATIONS

A. Agency or its Contractor shall arrange and conduct its work so that there will be no interference with CSX operations, including train, signal, telephone and telegraphic services, or damage to CSX's property, or to poles, wires, and other facilities of tenants on CSX's Property or right-of-way. Agency or its Contractor shall store materials so as to prevent trespassers from causing damage to trains, or CSX Property. Whenever Work is likely to affect the operations or safety of trains, the method of doing such Work shall first be submitted to the CSX Representative for approval, but such approval shall not relieve Agency or its Contractor from liability in connection with such Work.

B. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSX's property, Agency or its Contractor shall make such provision. If the CSX Representative determines that such provision is insufficient, CSX may, at the expense of Agency or its Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

III. NOTICE OF STARTING WORK. Agency or its Contractor shall not commence any work on CSX Property or rights-of- way until it has complied with the following conditions:

A. Notify CSX in writing of the date that it intends to commence Work on the Project. Such notice must be received by CSX at least ten business days in advance of the date Agency or its Contractor proposes to begin Work on CSX property. The notice must refer to this Agreement by date. If flagging service is required, such notice shall be submitted at least thirty (30) business days in advance of the date scheduled to commence the Work.

B. Obtain authorization from the CSX Representative to begin Work on CSX property, such authorization to include an outline of specific conditions with which it must comply.

C. Obtain from CSX the names, addresses and telephone numbers of CSX's personnel who must receive notice under provisions in the Agreement. Where more than one individual is designated, the area of responsibility of each shall be specified.

IV. WORK FOR THE BENEFIT OF THE CONTRACTOR

A. No temporary or permanent changes to wire lines or other facilities (other than third party fiber optic cable transmission systems) on CSX property that are considered necessary to the Work are anticipated or shown on the Plans. If any such changes are, or become, necessary in the opinion of CSX or Agency, such changes will be covered by appropriate revisions to the Plans and by preparation of a force account estimate. Such force account estimate may be initiated by either CSX or Agency, but must be approved by both CSX and Agency. Agency or Contractor shall be responsible for arranging for the relocation of the third party fiber optic cable transmission systems, at no cost or expense to CSX.

B. Should Agency or Contractor desire any changes in addition to the above, then it shall make separate arrangements with CSX for such changes to be accomplished at the Agency or Contractor's expense.

V. HAUL ACROSS RAILROAD

A. If Agency or Contractor desires access across CSX property or tracks at other than an existing and open public road crossing in or incident to construction of the Project, the Agency or Contractor must first obtain the permission of CSX and shall execute a license agreement or right of entry satisfactory to CSX, wherein Agency or Contractor agrees to bear all costs and liabilities related to such access.

B. Agency and Contractor shall not cross CSX's property and tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be permitted pursuant to this section.

VI. COOPERATION AND DELAYS

A. Agency or Contractor shall arrange a schedule with CSX for accomplishing stage construction involving work by CSX. In arranging its schedule, Agency or Contractor shall ascertain, from CSX, the lead time required for assembling crews and materials and shall make due allowance therefore.

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B. Agency or Contractor may not charge any costs or submit any claims against CSX for hindrance or delay caused by railroad traffic; work done by CSX or other delay incident to or necessary for safe maintenance of railroad traffic; or for any delays due to compliance with these Special Provisions.

C. Agency and Contractor shall cooperate with others participating in the construction of the Project to the end that all work may be carried on to the best advantage.

D. Agency and Contractor understand and agree that CSX does not assume any responsibility for work performed by others in connection the Project. Agency and Contractor further understand and agree that they shall have no claim whatsoever against CSX for any inconvenience, delay or additional cost incurred by Agency or Contractor on account of operations by others.

VII. STORAGE OF MATERIALS AND EQUIPMENT

Agency and Contractor shall not store their materials or equipment on CSX's property or where they may potentially interfere with CSX's operations, unless Agency or Contractor has received CSX Representative's prior written permission. Agency and Contractor understand and agree that CSX will not be liable for any damage to such materials and equipment from any cause and that CSX may move, or require Agency or Contractor to move, such material and equipment at Agency's or Contractor's sole expense. To minimize the possibility of damage to the railroad tracks resulting from the unauthorized use of equipment, all grading or other construction equipment that is left parked near the tracks unattended by watchmen shall be immobilized to the extent feasible so that it cannot be moved by unauthorized persons.

VIII. CONSTRUCTION PROCEDURES

A. General

1. Construction work on CSX property shall be subject to CSX's inspection and approval.

2. Construction work on CSX property shall be in accord with CSX's written outline of specific conditions and with these Special Provisions.

3. Contractor shall observe the terms and rules of the CSX Safe Way manual, which Agency and Contractor shall be required to obtain from CSX, and in accord with any other instructions furnished by CSX or CSX's Representative.

B. Blasting

1. Agency or Contractor shall obtain CSX Representative's and Agency Representative's prior written approval for use of explosives on or adjacent to CSX property. If permission for use of explosives is granted, Agency or Contractor must comply with the following:

a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of Agency or Contractor.

b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.

c. No blasting shall be done without the presence of an authorized representative of CSX. At least 30 days' advance notice to CSX Representative is required to arrange for the presence of an authorized CSX representative and any flagging that CSX may require.

d. Agency or Contractor must have at the Project site adequate equipment, labor and materials, and allow sufficient time, to (i) clean up (at Agency's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at Agency's expense) any track misalignment or other damage to CSX's property resulting from the blasting, as directed by CSX Representative, without delay to trains. If Agency's or Contractor's actions result in delay of any trains, including Amtrak passenger trains, Agency shall bear the entire cost thereof.

e. Agency and Contractor shall not store explosives on CSX property.

2. CSX Representative will:

a. Determine the approximate location of trains and advise Agency or Contractor of the approximate amount of time available for the blasting operation and clean-up.

b. Have the authority to order discontinuance of blasting if, in his or her opinion, blasting is too hazardous or is not in accord with these Special Provisions.

IX. MAINTENANCE OF DITCHES ADJACENT TO CSX TRACKS

Agency or Contractor shall maintain all ditches and drainage structures free of silt or other obstructions that may result from their operations. Agency or Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either

(1) silt fence; (2) hay or straw barrier; (3) berm or temporary ditches; (4) sediment basin; (5) aggregate checks; and (6) channel lining. All such maintenance and repair of damages due to Agency's or Contractor's operations shall be performed at Agency's expense.

X. FLAGGING / INSPECTION SERVICE

A. CSX has sole authority to determine the need for flagging required to protect its operations and property. In general, flagging protection will be required whenever Agency or Contractor or their equipment are, or are likely to be, working within fifty (50) feet of live track or other track clearances specified by CSX, or over tracks.

B. Agency shall reimburse CSX directly for all costs of flagging that is required on account of construction within CSX property shown in the Plans, or that is covered by an approved plan revision, supplemental agreement or change order.

C. Agency or Contractor shall give a minimum of 10 days' advance notice to CSX Representative for anticipated need for flagging service. No work shall be undertaken until the flag person(s) is/are at the job site. If it is necessary for CSX to advertise a flagging job for bid, it may take up to 90-days to obtain this service, and CSX shall not be liable for the cost of delays attributable to obtaining such service.

D. CSX shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CSX Representative, such inspection may be necessary. Agency shall reimburse CSX for the costs incurred by CSX for such inspection service. Inspection service shall not relieve Agency or Contractor from liability for its Work.

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E. CSX shall render invoices for, and Agency shall pay for, the actual pay rate of the flagpersons and inspectors used, plus standard additives, whether that amount is above or below the rate provided in the Estimate. If the rate of pay that is to be used for inspector or flagging service is changed before the work is started or during the progress of the work, whether by law or agreement between CSX and its employees, or if the tax rates on labor are changed, bills will be rendered by CSX and paid by Agency using the new rates. Agency and Contractor shall perform their operations that require flagging protection or inspection service in such a manner and sequence that the cost of such will be as economical as possible.

XI. UTILITY FACILITIES ON CSX PROPERTY

Agency shall arrange, upon approval from CSX, to have any utility facilities on or over CSX Property changed as may be necessary to provide clearances for the proposed trackage.

XII. CLEAN-UP

Agency or Contractor, upon completion of the Project, shall remove from CSX's Property any temporary grade crossings, any temporary erosion control measures used to control drainage, all machinery, equipment, surplus materials, falsework, rubbish, or temporary buildings belonging to Agency or Contractor. Agency or Contractor, upon completion of the Project, shall leave CSX Property in neat condition, satisfactory to CSX Representative.

XIII. FAILURE TO COMPLY

If Agency or Contractor violate or fail to comply with any of the requirements of these Special Provisions, (a) CSX may require Agency and/or Contractor to vacate CSX Property; and (b) CSX may withhold monies due Agency and/or Contractor; (c) CSX may require Agency to withhold monies due Contractor; and (d) CSX may cure such failure and the Agency shall reimburse CSX for the cost of curing such failure.

EXHIBIT D

INITIAL ESTIMATE ATTACHED

EXHIBIT E

PAYMENT SCHEDULE

[SELECT ONE OF FOLLOWING ALTERNATE PROVISIONS:]

Advance Payment in Full

Upon execution and delivery of notice to proceed with the Project, Agency will deposit with CSX a sum equal to the Reimbursable Expenses, as shown by the Estimate. If CSX anticipates that it may incur Reimbursable Expenses in excess of the deposited amount, CSX will request an additional deposit equal to the then remaining Reimbursable Expenses which CSX estimates that it will incur. CSX shall request such additional deposit by delivery of invoices to Agency. Agency shall make such additional deposit within 30 days following delivery of such invoice to Agency.

50/50 Payment in Advance

Upon delivery of notice to proceed with the Project, Agency will deposit with CSX a sum equal to fifty percent (50%) of the Reimbursable Expenses as shown by the Estimate. Prior to the incurrence of Reimbursable Expenses in excess of such deposit, CSX will request an additional deposit equal to the Reimbursable Expenses which CSX expects to incur. CSX shall request such additional deposit by delivery of invoices to Agency. Agency shall make such additional deposits within 30 days following delivery of such invoice to Agency.

Scheduled Payments

Agency shall deposit with CSX the following sums on or before the dates set forth below, which sums and dates shall be subject to adjustment in the event of revisions to the Estimate:

Payment Date:	Payment:
_____	_____
	Total:
	_____

Progress Payments In Arrears

Notwithstanding anything to the contrary set forth in this Agreement, Agency shall pay CSX in arrears for its Reimbursable Expenses, rather than in advance, with only such exceptions, such as purchasing materials and equipment, as the parties mutually agree. Accordingly, Agency shall remit payment to CSX for its Reimbursable Expenses within thirty (30) days following delivery to Agency of an invoice.

EXHIBIT F
INSURANCE REQUIREMENTS

I. Insurance Policies

Agency and Contractor, if and to the extent that either is performing work on or about CSX's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than $5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured.

2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than $1,000,000, which insurance must contain a waiver of subrogation against CSX and its affiliates (if permitted by state law).

3. Commercial automobile liability insurance with limits of not less than $1,000,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured.

4. Railroad protective liability insurance with limits of not less than $5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of $10,000,000, which insurance shall satisfy the following additional requirements:

a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.

b. CSX Transportation must be the named insured on the Railroad Protective Insurance Policy.

c. Name and Address of Contractor and Agency must appear on the Declarations page.

d. Description of operations must appear on the Declarations page and must match the Project description.

e. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.

f. Authorized endorsements may include:
- (i). Broad Form Nuclear Exclusion - IL 00 21
- (ii) 30-day Advance Notice of Non-renewal or cancellation
- (iii) Required State Cancellation Endorsement
- (iv) Quick Reference or Index - CL/IL 240

g. Authorized endorsements may not include:
- (i) A Pollution Exclusion Endorsement except CG 28 31
- (ii) A Punitive or Exemplary Damages Exclusion
- (iii) A "Common Policy Conditions" Endorsement
- (iv) Any endorsement that is not named in Section 4 (e) or (f) above.
- (v) Policies that contain any type of deductible

5. All insurance companies must be A. M. Best rated A- and Class VII or better.

6. The CSX OP number or CSX contract number, as applicable, must appear on each Declarations page and/or certificates of insurance.

7. Such additional or different insurance as CSX may require.

II. Additional Terms

1. Contractor must submit the complete Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies in an electronic format to:

Insurance Department
CSX Transportation, Inc.
500 Water Street, C-907
Jacksonville, FL 32202

OR

insurancedocuments@csx.com

2. Neither Agency nor its Designee may begin work on or about CSX property until written approval of the required insurance has been received from CSX or CSX's Insurance Compliance vendor, Ebix.

SCHEDULE I

CONTRACTOR'S ACCEPTANCE

To and for the benefit of CSX Transportation, Inc. ("CSX") and to induce CSX to permit Contractor on or about CSX's property for the purposes of performing work in accordance with the Agreement dated_____, 201____, between [INSERT NAME OF AGENCY] and CSX, Contractor hereby agrees to abide by and perform all applicable terms of the Agreement, including, but not limited to Exhibits C and F to the Agreement, and Sections 3, 9 and 11 of the Agreement.

Contractor: _____

By:_____
Name_____
Title:_____
Date: _____

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APPENDIX

CSX TRANSPORTATION

TEMPORARY RIGHT OF ENTRY AGREEMENT

Public Projects Group
Jacksonville, FL
Date Issued: March 2025

THIS AGREEMENT, made as of _____, 20___, by and between CSX TRANSPORTATION, INC., a Virginia corporation, whose mailing address is 500 Water Street, Jacksonville, Florida 32202, hereinafter called "CSX," and (**********), whose mailing address is (**********), (**********), hereinafter called "Licensee," WITNESSETH:

WHEREAS, Licensee has submitted a written application to CSX requesting permission to enter CSX's property located within the (*****) Division, (*****) Subdivision, at DOT#: (****) MP (****). (**Street**) in (**City**), (***) County, (**State**) (the "Property"), (description of scope of work), beginning (**) feet from the (****) and (***) right of way, (the "Project").

WHEREAS, CSX is willing to grant to Licensee the limited right and permission to enter upon the Property for the limited purpose of performing the Project.

NOW THEREFORE, CSX hereby grants to Licensee the right and permission to enter upon the Property for the purpose of performing said Project, subject to the terms and conditions set forth below:

1. PROJECT: The Project shall be performed at the entire cost and expense of Licensee, in accordance with good and sound engineering practices, to the satisfaction of CSX's Division Engineer or his or her duly authorized representative ("Division Engineer") and in a manner to avoid accidents, damages, unnecessary delays to or interference with train traffic of CSX. Prior to entry, Licensee shall notify the Division Engineer's representative and arrange for flagging protection in accordance to Sections 5 and 6 of this Agreement. Licensee shall not dig in the ballast line or within the tracks loading influence area, or otherwise disturb the track structure. Licensee and Licensee's employees, agents, contractors and other representatives (collectively, "Agents") shall maintain in their possession a copy of this Agreement at all times during their occupation of the Property.

2. INDEMNITY:

2.1 Licensee hereby assumes risk of and agrees to indemnify, defend, protect and save CSX and CSX's Affiliates harmless with respect to any and all attorneys' fees, liability, claims, demands, payments, suits, actions, recoveries, penalties, costs, legal expenses, judgments, settlements, and damages of every nature, degree, and kind (including direct, indirect, consequential, incidental, and punitive damages) for:

2.1.1 Personal injury, including, but not limited to bodily injury to or death of any person or persons whomsoever, including the agents, servants, Affiliates or employees of the parties;

2.1.2 The loss or damage to any property whatsoever, including property owned or in the care, custody or control of the parties hereto or their respective Affiliates;

2.1.3 Any environmental damage and any related remediation brought or recovered against CSX or any of its Affiliates; and

2.1.4 Any and all other losses or damages; arising directly or indirectly from the presence of Licensee or its Agents on or about the Property, whether or not attributable in whole or part to the negligence, gross negligence, or intentional misconduct of CSX or its Affiliates.

2.2 The parties waive any and all right or opportunity to contest the enforceability of this Section and agree that, in the event this Section, or any part of this Section, is found unenforceable by the final, unappealable judgment of a court of competent jurisdiction, this Section shall be construed so as to be enforceable to the maximum extent permitted by applicable law. In the event that such court of competent jurisdiction finds that Florida statutory construction contract indemnity monetary limits apply to this Agreement with respect to Licensee's indemnification of CSX and its Affiliates for liability caused in whole or in part by any act, omission or default by CSX or its Affiliates, the parties hereto agree that such limit shall be equal to the limits (exclusive of deductibles) of the applicable insurance required by Sections 3 and 4 of this Agreement. The parties acknowledge and agree that this monetary limit,

if required, bears a commercially reasonable relationship to this Agreement, in so far as, among other factors, the parties have taken into account the availability and cost of insurance and other risk transference devices, the scope of the Project, the risks associated with the Project, and the compensation and any other benefits exchanged between the parties in connection with this Agreement.

2.2.1 Licensee shall comply with any federal, state, or local laws, statutes, codes, ordinances, rules, and regulations applicable to its presence or performance of any activity on the Property and agrees to indemnify, defend, and hold CSX and its Affiliates harmless with respect to any fines, penalties, liabilities, or other consequences for its failure to so comply.

2.2.2 For the purpose of this Agreement, the term "Affiliates" includes all entities, directly or indirectly owned or controlled by, or under common control of a party or its respective officers, directors, employees and agents, and in the case of CSX, includes CSX Corporation, CSX and their Affiliates and their respective officers, directors, employees and agents.

2.2.3 The provisions of this Section shall survive the termination or expiration of this Agreement.

3. GENERAL LIABILITY INSURANCE: Licensee shall procure and maintain, at its expense: (i) statutory Worker's Compensation and Employers Liability Insurance with available limits of not less than $1,000,000.00, which insurance must contain a waiver of subrogation against CSX and its Affiliates; (ii) Commercial General Liability coverage (inclusive of contractual liability) with available limits of not less than $5,000,000.00 in combined single limits for bodily injury and property damage and covering the contractual liabilities assumed under this Agreement; (iii) business automobile liability insurance with available limits of not less than $1,000,000.00 combined single limit for bodily injury and/or property damage per occurrence; and (iv) such other insurance as CSX may reasonably require. Upon request, Licensee shall provide CSX with a copy of Licensee's applicable insurance policies. A policy endorsement naming CSX as an additional insured and specifying such coverage shall be furnished to CSX prior to the execution of this Agreement, and the required coverage will be kept in force until all of Licensee's obligations under this Agreement have been fully discharged and fulfilled, or until Licensee shall have been specifically released by a written instrument signed by an authorized officer of CSX. Licensee shall also provide CSX with a copy of the insurance policies. The insurance policies shall provide that the insurance carrier must give CSX notice at least thirty (30) days in advance of cancellation of coverage, of any change in coverage, or of cancellation of the policy. Notwithstanding any provisions of this Section, the liability assumed by Licensee shall not be limited to the required insurance coverage.

4. RAILROAD PROTECTIVE LIABILITY INSURANCE: Licensee agrees to purchase Railroad Protective Liability Insurance in accordance with CSX's requirements (attached as Exhibit A and incorporated into this Agreement) for the benefit of CSX for Licensee's operations under this Agreement. Licensee shall furnish an appropriate Insurance policy (and required endorsements), as the case may be, with the return of this executed Agreement.

5. PRIOR NOTIFICATION: Licensee or Licensee's Agents shall notify CSX's Roadmaster at least 10 days prior to requiring entry on the Property and shall abide by the instructions of the Division Engineer, or his or her authorized representative. The Roadmaster, (*****), can be contacted at: (*******), to schedule flagging services.

6. CLEARANCES: Neither Licensee nor Agents shall perform any Project or place or operate any equipment of Licensee or Agents at a distance closer than fifty (50) feet from the center of any track, without the prior approval of the Division Engineer. The Division Engineer may require protective services or such other services as deemed necessary or appropriate. Equipment shall be moved across CSX's track(s) only at a public crossing unless prior arrangements have been made with the Division Engineer and a Private Crossing Agreement is fully executed and in place. Licensee and Agents shall take all precautions

necessary to avoid interference with or damage to CSX's property and signal and communication facilities during their performance of the Project.

7. PROTECTIVE SERVICES: If protective services, such as flagging protection, are required by CSX, Licensee shall make arrangements with the Roadmaster to furnish such personnel, flagman or watchman, that in the Roadmaster's opinion may be necessary to protect the facilities and traffic of CSX during the performance of the Project. Licensee shall pay for the cost of such services, including all applicable surcharges and additives. These services are estimated to be $_____, as supported by the attached estimate.

8. PAYMENT FOR PROTECTIVE SERVICES: Payment shall be made by Licensee in accordance with the following designated option:

( ) Option 1: Licensee shall make an advance deposit of funds based on an estimate of the cost of protective or other services as determined by CSX. The cost for CSX's services shall then be assessed by CSX against this advance deposit. Upon completion of the Project, any unused funding will be returned to Licensee. Notwithstanding the foregoing, in the event Licensee performs any Project work without permission or without protective services (such as flagging protection) as may be required by CSX, no portion of Licensee's advance deposit will be refunded. If CSX's costs exceed the advance deposit(s), a request will be made to Licensee for additional funds or an invoice will be issued to Licensee for final payment. Licensee shall remit payment to CSX within thirty (30) days of receipt of either a request for additional funds or an invoice.

( ) Option 2: Licensee shall promptly reimburse CSX for the cost of protective or other services on an as-incurred basis, including all applicable surcharges, upon receipt of bill(s) therefor.

9. ENVIRONMENTAL: This Agreement does not include and expressly excludes the performance of any site investigation activities designed to determine environmental conditions on, about or beneath the Property. Precluded activities include performing soil borings for purposes other than geotechnical investigation, obtaining soil, sediment, groundwater and surface water samples, and conducting field or laboratory analyses of any soil, sediment, groundwater or surface water samples obtained from CSX property to identify chemical composition or environmental condition. If any type of environmental investigation is desired, a separate right of entry agreement issued through CSX's Environmental Department must be secured.

10. CLAIMS: Licensee shall, or shall require Agents, to promptly notify the Division Engineer of any loss, damage, injury or death arising out of or in connection with the Project.

11. REMEDIATION: It is understood and agreed that, upon completion of the Project, the Property shall be left in a condition satisfactory to Division Engineer or his or her duly authorized representative.

12. SAFETY:

12.1 All personnel entering the Property must comply with CSX safety rules and requirements to include, without exception, the wearing of hard hats and approved safety shoes and safety glasses with side shields. Anyone not in compliance with these rules and regulations will be asked to leave the Property.

12.2 Before performing any work authorized by this Agreement, Licensee, at its sole cost and expense, shall obtain all necessary permit(s) (including but not limited to zoning, building, construction, health, safety or environmental matters), letter(s) or certificate(s) of approval. Licensee expressly agrees and warrants that it shall conform and limit its activities to the terms of such permit(s), approval(s) and authorization(s), and shall comply with all applicable ordinances, rules, regulations, requirements and laws of any governmental authority (state, federal or local) having jurisdiction over Licensee's activities, including the location, contact, excavation and protection regulations of the Occupational Safety and Health Act (OSHA) (29 CFR 1926.651(b), et al.), and State "One Call" -"Call Before You Dig" requirements.

13. TERM: This Right-of-Entry Agreement and the permission conferred and the license granted by it does not constitute a grant of permanent easement and shall terminate upon completion of the Project or at midnight, , whichever occurs first, unless extended in writing by CSX. In the event Licensee fails to comply with terms and provisions of this Agreement, Licensee agrees to pay and agrees that CSX shall be entitled to recover costs and expenses incurred by CSX, including legal fees and expenses, to enforce the terms of this Agreement.

14. SEVERABILITY: The parties agree that if any part, term or provision of the Agreement is held to be illegal, unenforceable or in conflict with any applicable federal, state, or local law or regulation, such part, term or provision shall be severable, with the remainder of the Agreement remaining valid and enforceable. If any provision or any part of a provision of the Agreement shall be finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable law, ordinance, rule or regulation, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Agreement, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

15. ENTIRE AGREEMENT: This Agreement embodies the entire understanding of the parties, may not be waived or modified except in a writing signed by authorized representatives of both parties, and supersedes all prior or contemporaneous written or oral understandings, agreements or negotiations regarding its subject matter.

16. NOTICES: All notices, consents and approvals required or permitted by this agreement shall be in writing and shall be deemed delivered; upon personal delivery, upon the expiration of three (3) business days following mailing by U.S. first class mail, or upon the next business day following mailing by a nationally recognized overnight carrier, to the Licensee at the address above, and to Licensor at the address shown on Page 1, or at such other addresses as either party may designate by delivery of prior notice to the other party .

17. TERMINATION: CSX shall have the right at any time and at its sole discretion to terminate this Agreement upon notice to Licensee.

18. WAIVER: If either party fails to enforce its respective rights under this Agreement, or fails to insist upon the performance of the other party's obligations hereunder, such failure shall not be construed as a permanent waiver of any rights or obligations in this Agreement.

19. GOVERNING LAW; VENUE: This Agreement shall be governed by and construed under the laws of the State of Florida, without regard to the choice of law provisions thereof. Venue for any action arising from, or brought to enforce, this Agreement, shall vest exclusively in the state or federal courts located in Duval County, Florida, and the parties agree to submit to the personal jurisdiction of any state or federal court located in Duval County, Florida.

20. NO ASSIGNMENT: Notwithstanding anything to the contrary contained in this Agreement, Licensee shall not permit Agents to enter the Property without first requiring Agents to agree in writing to comply with all of the terms of this Agreement. Notwithstanding the foregoing, Licensee shall continue to be responsible for insuring that Agents comply with all of the terms and conditions of this Agreement and shall indemnify and hold CSX harmless for any damages described in Section 2 above caused in whole or in part by such subcontractor. Assignment of this Agreement to any party other than Agents in accordance with this Section shall not be permitted except upon the prior written consent of CSX, which consent may be granted or withheld at CSX's sole discretion. This Agreement shall be binding upon the parties and their respective successors and assigns.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the day and year first above written.

Witness for CSX Transportation:

_____

CSX TRANSPORTATION, INC.

By: _____

Name:

Title:

Witness for: ( )

_____

( ):

By: _____

Print/Type Name:

Print/Type Title:

Who, by the execution hereof, affirms that he/she has the authority to do so and to bind the [*] to the terms and conditions of this Agreement.

ATTACHMENT "A"
INSURANCE REQUIREMENTS

I. Insurance Policies:

Agency and its Designee, if and to the extent that either is performing work on or about CSX's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than$5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured. The policy shall include endorsement ISO CG 24 17 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.

2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than$1,000,000, which insurance must contain a waiver of subrogation against CSX and its affiliates (if permitted by state law).

3. Commercial automobile liability insurance with limits of not less than $1,000,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured. The policy shall include endorsement ISO CA 20 70 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.

4. Railroad protective liability insurance with limits of not less than $5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of $10,000,000, which insurance shall satisfy the following additional requirements:

a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.

b. CSX Transportation must be the named insured on the Railroad Protective Insurance Policy.

c. Name and Address of Contractor and Agency must appear on the Declarations page.

d. Description of operations must appear on the Declarations page and must match the Project description.

e. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.

f. Authorized endorsements may include:

(i). Broad Form Nuclear Exclusion - IL 00 21
(ii) 30-day Advance Notice of Non-renewal or cancellation
(iii) Required State Cancellation Endorsement
(iv) Quick Reference or Index - CL/IL 240

g. Authorized endorsements may not include:
(i) A Pollution Exclusion Endorsement except CG 28 31
(ii) A Punitive or Exemplary Damages Exclusion
(iii) A "Common Policy Conditions" Endorsement
(iv) Any endorsement that is not named in Section 4 (e) or (f) above.
(v) Policies that contain any type of deductible

5. All insurance companies must be A. M. Best rated A- and Class VII or better.

6. The CSX OP number or CSX contract number, as applicable, must appear on each Declarations page and/or certificates of insurance.

7. Such additional or different insurance as CSX may require.

II. Additional Terms

1. Contractor must submit the complete Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies in an electronic format to:

Insurance Department
CSX Transportation, Inc.
500 Water Street, C-907
Jacksonville, FL 32202

OR

insurancedocuments@csx.com

2. Neither Agency nor its Designee may begin work on or about CSX property until written approval of the required insurance has been received from CSX or CSX's Insurance Compliance vendor, Ebix.

APPENDIX

CSX TRANSPORTATION

RIGHT of ENTRY AND INDEMNITY AGREEMENT FOR BRIDGE PAINTING (AESTHETIC)

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

RIGHT OF ENTRY AND INDEMNITY AGREEMENT FOR BRIDGE PAINTING (AESTHETIC)

This Agreement is made and effective as of _____, by and between CSX TRANSPORTATION, INC., a Virginia corporation, with a mailing address of 500 Water Street, Jacksonville, Florida 32202, hereinafter called "CSX," and the Name of Agency, a public corporation, under the laws of the State of State, with a mailing address of Street Address, PO Box, City State and ZIP, hereinafter called "AGENCY".

WHEREAS, CSX controls and operates a right of way and bridge located within the ****** Division, ***** Subdivision, at DOT#: 123456A MP XXX-123.45. Street Name in City, County County, State ("the Property");

WHEREAS, AGENCY has submitted a written request to enter the Property and to clean and paint the facing of the bridge (the "Project") as described in Exhibit A, attached and incorporated by reference; and

WHEREAS, CSX is willing to grant AGENCY the limited right and permission to enter upon the Property for the limited purpose of performing the Project;

NOW, THEREFORE, CSX hereby grants to AGENCY the right and permission to enter upon the Property for the purpose of performing the Project, subject to the terms and conditions set forth below:

1. TERM AND SCOPE

From the period starting from the date of execution of this Agreement, through the date that is one year from such date unless further extended by mutual agreement of the parties (the "Term"), AGENCY, through its employees, agents, contractors, subcontractors, and/or other representatives (each, a "Designee" and collectively, "Designees"), may, only once (meaning not on a repetitive basis) enter the Property and perform the Project (the "Work"). Notwithstanding the foregoing, provided that CSX shall first have approved the specifications therefore, as set forth in Section 2 hereof, AGENCY may also engage in periodic spot painting to remove graffiti (the "Spot Painting").

2. PROJECT

A. All plans, specifications, drawings and other documents necessary or appropriate to the design and performance of the Project, including but not limited to paint color and temporary attachment specifications (if any), shall be prepared, at AGENCY's sole cost and expense, by AGENCY or its Designees. Such plans shall be submitted to CSX for review and approval of CSX at least thirty (30) days prior to starting the Work or Spot Painting. The specifications for Spot Painting must include the paint color (which must be compatible with the most recent paint applied), application method (e.g. spray, brush, etc.), and structure access/reach equipment type (e.g. ladders, man lifts, etc.). CSX may require paint removal prior to Spot Painting for safety reasons; if so, AGENCY must also submit a paint removal method (e.g. sand-blasting, chemical removal, etc.). No Work or Spot Painting may begin until CSX has approved the plans and specifications. By its review or approval of plans pursuant to this Agreement, CSX signifies only that such plans and performance of the Work and Spot Painting in accordance with such plans satisfy CSX's requirements.

B. Upon receipt of the specifications, CSX's authorized representative will determine and inform AGENCY whether a flagman need be present and whether AGENCY need implement any special protective or safety measures. If a flagman is required, AGENCY shall notify CSX's authorized representative and arrange for safety protection in accordance with this Agreement.

C. The Work and Spot Painting shall be performed in accordance with good and sound practices, to the satisfaction of CSX's authorized representative in a manner to avoid accidents, damages, unnecessary delays to or interference with the continuous and uninterrupted use of CSX tracks or other operations, including train, signal, telephone and communication services, or damage to CSX's property, or to poles, wires, and other facilities of tenants on CSX's property or right-of-way. Under no circumstances shall Work or Spot Painting affect the operations or safety of trains. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSX's property, AGENCY shall make such provision.

D. The Project shall be designed and the Work and Spot painting performed at no cost, expense or liability to CSX.

3. COMMENCEMENT OF WORK; AUTHORITY OF CSX REPRESENTATIVE

A. AGENCY shall not commence any Work on CSX Property until AGENCY has:

1. Notified CSX in writing of the date that it expects Work or Spot Painting to commence on the Project. Such notice must be received by CSX at least ten (10) business days in advance of the date AGENCY proposes to begin Work or Spot Painting on the Property. The notice must refer to this Agreement by date.

2. Obtain authorization from CSX's authorized representative to begin Work on CSX property, such authorization to include an outline of specific conditions with which AGENCY must comply.

B. CSX retains the paramount right to regulate all activities affecting its property and operations. CSX's authorized representative shall have final authority in all matters affecting the safe maintenance of CSX operations and CSX property, and his or her approval shall be obtained by AGENCY for methods of construction to avoid interference with CSX operations and CSX property and all other matters contemplated by the Agreement.

4. FLAGGING / INSPECTION SERVICE

A. CSX has sole authority to determine the need for flagging required to protect its operations and property.

B. CSX shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CSX's authorized representative, such inspection may be necessary.

C. Any CSX expenses associated with flagging and inspection service shall be calculated, estimated, and reimbursed by AGENCY in the manner described in Section 10.

D. Should CSX's authorized representative determine that flagging is necessary, AGENCY may attempt to coordinate the timing of the Work or Spot Painting with CSX's authorized representative so that the Project may be performed during times that flagging is already ongoing at the Property.

5. SAFETY

A. CSX will provide AGENCY with a copy of its safety rules and requirements prior to the commencement of the Work or Spot Painting. Any AGENCY personnel or Designee entering the Property must comply with CSX's safety rules and requirements. Anyone not in compliance with these rules and regulations will be asked to leave the Property.

B. Before performing any Work authorized by this Agreement, AGENCY, at no expense to CSX, will obtain all necessary permit(s) (including, but not limited to, zoning, building, construction, health, safety or environmental matters), letter(s) or certificate(s) of approval. AGENCY expressly agrees and warrants that it shall conform and limit activities to the terms of such permit(s), approval(s) and authorization(s), and shall comply with all applicable ordinances, rules, regulations, requirements and laws of any governmental authority (state, federal or local) having jurisdiction over the activities in the Project, including applicable provisions of the Occupational Safety and Health Act (OSHA) (29 CFR 1926.651(b), et al.).

6. ACCESS LIMITATIONS; STORAGE OF MATERIALS

A. This Agreement does not give AGENCY the right to cross CSX property or tracks with vehicles, equipment or in any other matter other than at an existing and open public crossing. At no time will anyone performing the Work or Spot Painting be allowed beyond the bridge abutments on CSX's property or be allowed on top of the bridge unless accompanied by CSX personnel.

B. AGENCY shall not store materials or equipment on CSX's property or where they may potentially interfere with CSX's operations, unless AGENCY has received prior written permission from CSX's authorized representative.

7. ENVIRONMENTAL

A. This Agreement does not include and expressly excludes the performance of any site investigation activities designed to determine environmental conditions on, about or beneath the Property.

B. AGENCY shall comply with all federal, state and local environmental laws and regulations in its work at the Property and shall perform the Work or Spot Painting in an environmentally protective manner, and shall prevent releases and spills of any materials that could harm human health or the environment, including but not limited to, hydrocarbon products, anti-freeze, spent mechanical draining, solvents, hazardous substances and hazardous wastes as defined in the Comprehensive Environmental Response, Compensation and Liability Act and the Resource Conservation and Recovery Act, respectively ("Environmental Substances"). AGENCY, at its expense, shall assume all responsibility for the investigation and cleanup of any release or discharge of any Environmental Substance at the Property that arises from the performance of any work, presence or other activity at the Property by AGENCY or its Designees. In addition to other liability terms contained in this Agreement, AGENCY agrees to indemnify, defend and hold harmless CSX and CSX's Affiliates from and against all environmental costs and expenses, including without limitation, all environmental analysis and cleanup expenses, fines and claims, or penalties arising from any work, presence or activity of the AGENCY or its Designees at the Property.

8. REMEDIATION AND CLEAN-UP

AGENCY, upon completion of the Work or Spot Painting, shall (i) remove from the Property any equipment, surplus materials, or rubbish belonging to AGENCY or AGENCY's Designee; and (ii) leave CSX Property to its original condition, satisfactory to CSX's authorized representative.

9. INSURANCE AND WAIVERS

AGENCY shall (i) acquire or require AGENCY's Designee to purchase and maintain insurance in compliance with CSX's insurance requirements attached to this Agreement as Exhibit B; (ii) require any individual not employed by AGENCY to execute the Waiver and Release Form attached hereto as Exhibit C; and (iii) require any Designee to execute the Acceptance by AGENCY Designee Form attached hereto as Exhibit D prior to entering CSX property and/ or commencing any Work or Spot Painting. Neither AGENCY nor AGENCY's Designee shall commence the Work or Spot Painting until such insurance policy or policies and forms have been submitted to and approved by CSX's Risk Management Department.

10. CSX'S COSTS AND EXPENSES; REIMBURSEMENT PROCEDURES

A. Reimbursable Expenses. AGENCY shall reimburse CSX or shall cause AGENCY's Designee to reimburse CSX for all costs and expenses incurred by CSX in connection with the Project, Work or Spot Painting (the "Reimbursable Expenses").

B. Estimate. CSX has estimated the total Reimbursable Expenses as shown on Exhibit E (the "Estimate", as amended or revised). In the event CSX anticipates that actual Reimbursable Expenses may exceed such Estimate, it shall provide AGENCY with the revised Estimate of the total Reimbursable Expenses.

C. Payment Terms. Upon execution and delivery of this Agreement by AGENCY, AGENCY will deposit with CSX a sum equal to the estimated Reimbursable Expenses, as shown by the Estimate. Following completion of the Project, CSX shall submit to AGENCY a final invoice that reconciles the total costs incurred by CSX against the total payments received from AGENCY. AGENCY shall pay to CSX the amount by which expenses exceed total payments as shown by the final invoice, within thirty (30) days following delivery of such invoice to AGENCY. In the event that the payments received by CSX from AGENCY exceed the estimated expenses, CSX shall remit such excess to AGENCY.

11. INDEMNIFICATION.

A. As a material inducement for entering into this Agreement, and without which CSX would not enter into the same, AGENCY covenants and agrees that to the extent permitted by law, AGENCY shall indemnify, defend, and hold CSX and its affiliates harmless from and against all claims, demands, payments, suits, actions, judgments, settlements, and damages of every nature, degree, and kind (including direct, indirect, consequential, incidental, and punitive damages), for any injury to or death to any person(s) (including, but not limited to the employees of CSX, its affiliates, AGENCY or its Designees), for the loss of or damage to any property whatsoever (including but not limited to property owned by or in the care, custody, or control of CSX, its affiliates, AGENCY or its Designees), arising or resulting from the performance of this Agreement by AGENCY or any other person performing any work or service on the AGENCY's behalf on or about the Property. The foregoing indemnification obligation shall not be limited to the insurance coverage required by this Agreement, except to the extent required by law or otherwise expressly provided by this Agreement.

B. Compliance with Laws. AGENCY shall comply, and shall require its Designees to comply, with any federal, state, or local laws, statutes, codes, ordinances, rules, and regulations applicable to its construction and maintenance of the Project. AGENCY's Designees shall indemnify, defend, and hold CSX and its affiliates harmless with respect to any fines, penalties, liabilities, or other consequences arising from breaches of this Section.

C. "CSX Affiliates". For the purpose of this Agreement, CSX's affiliates include CSX Corporation and all entities, directly or indirectly, owned or controlled by or under common control of CSX or CSX Corporation and their respective officers, directors, employees and agents.

D. Survival. The provisions of this Section shall survive the termination or expiration of this Agreement.

12. CLAIMS

AGENCY shall promptly notify the CSX's authorized representative of any loss, damage, or injury arising out of or in connection with the Work or Spot Painting. AGENCY shall not create, permit or suffer any mechanic's or materialmen's liens of any kind or nature to be created or enforced against any property of CSX for any such Work or Spot Painting performed.

13. MAINTENANCE

A. By AGENCY. Upon completion of the Project, AGENCY, or its Designee, shall be solely responsible for maintaining the aesthetic appearance of the Project, including taking any actions deemed necessary by CSX, in its sole discretion, to address any damage or disfiguration due to vandalism or graffiti by Spot Painting, in accordance with Section 1. In the event AGENCY or its Designee fails to maintain the aesthetic appearance of the Project in a reasonable condition, as determined by CSX in its sole discretion, CSX, after due notice to AGENCY, may [(i) require AGENCY to remove or paint over the mural, (ii) at AGENCY Designee's sole cost and expense arrange for the mural to be removed or painted over, or (iii)] take such action as it deems appropriate to restore the railroad bridge to a condition acceptable to CSX. For purposes of this Section, "due notice" shall mean thirty (30) days' notice unless CSX, in its sole discretion, determines that an emergency condition exists, in which case, AGENCY or its Designee shall take immediate action.

B. By CSX. CSX shall not in any manner be restricted from (i) maintaining, repairing, replacing or renewing its tracks, all parts of the railroad bridge supports, signal and communication systems or any other rail facilities or its property as it deems appropriate or (ii) performing any actions required to reasonably support rail operations. Neither shall CSX in any manner be responsible for any damage or disfiguration caused to the Project due to such work, actions, or railroad operations, nor shall CSX be responsible for the aesthetic appearance of the mural or the area of the railroad bridge supports upon which the Project is painted, so long as AGENCY remains responsible for the maintenance of the Project.

C. Alterations. AGENCY shall not undertake any alteration, modification or expansion of the Project, without the prior approval of CSX, which may be withheld for any reason, and the execution of such agreements as CSX may require.

14. INDEPENDENT CONTRACTOR

The parties agree that neither AGENCY nor the AGENCY Designee shall be deemed either agents or independent contractors of CSX. Except as otherwise provided by this Agreement, CSX shall exercise no control whatsoever over the employment, discharge, compensation of, or services rendered by AGENCY or AGENCY's Representative, or the construction practices, procedures, and professional judgment employed by AGENCY or AGENCY's Representative to complete the Project. Notwithstanding the foregoing, this Section shall in no way affect the absolute authority of CSX to prohibit AGENCY or AGENCY's Representative or anyone from entering CSX's property, or to require the removal of any person from its property, if it determines, in its sole discretion, that such person is not acting in a safe manner or that actual or potential hazards in, on or about the Property exist.

15. INTERPRETATION

AGENCY and CSX each acknowledge that the terms, covenants, conditions, and provisions of this Agreement have been negotiated between and jointly authored by the parties hereto, and in consequence of this joint authorship, the parties agree that no term, covenant, condition or provision hereunder shall be construed more strictly against one party or the other hereto.

16. SEVERABILITY

The parties agree that if any part, term or provision of the Agreement is held to be illegal, unenforceable or in conflict with any applicable federal, state, or local law or regulation, such part, term or provision shall be severable, with the remainder of the Agreement remaining valid and enforceable. If any provision or any part of a provision of the Agreement shall be finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable law, ordinance, rule or regulation, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Agreement, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

17. ENTIRE AGREEMENT

This Agreement embodies the entire understanding of the parties, may not be waived or modified except in a writing signed by authorized representatives of all parties, and supersedes all prior or contemporaneous written or oral understandings, agreements or negotiations regarding its subject matter. No modification or alteration of the terms hereof shall be binding unless such modification or alteration is in writing and executed by the parties.

18. NOTICES

All notices, consents and approvals required or permitted by this agreement shall be in writing and shall be deemed delivered; upon personal delivery, upon the expiration of three (3) business days following mailing by U.S. first class mail, or upon the next business day following mailing by a nationally recognized overnight carrier, to the parties at the addresses set forth below, or such other addresses as either party may designate by delivery of prior notice to the other party.

TO CSX: CSX Transportation, Inc.
500 Water Street, J301
Jacksonville, Florida 32202
Attention – Director Project Management, Public Projects

TO AGENCY: Name_____
Title Agency_____
Street Address City, State ZIP_____

19. TERMINATION

CSX and AGENCY shall have the right to terminate this Agreement upon notice for any reason.

Termination of this Agreement or Work on the Project, for any reason, shall not diminish or reduce AGENCY's obligation to pay CSX for Reimbursable Expenses incurred in accordance with this Agreement. In the event of the termination of this Agreement or the Work for any reason, CSX's only remaining obligation to AGENCY shall be to refund to AGENCY payments made to CSX in excess of Reimbursable Expenses in accordance with Section 10.

20. WAIVER

If any party fails to enforce its respective rights under this Agreement, or fails to insist upon the performance of the other party's obligations hereunder, such failure shall in no way be construed as a permanent waiver of any rights or obligations in this Agreement, nor in any way to affect the validity of this Agreement or any part hereof or the right of either party to thereafter enforce each and every such provision and to exercise any such right or option. No waiver of any breach of this Agreement shall be held to be a waiver of any other or subsequent breach.

21. GOVERNING LAW; VENUE

This Agreement shall be governed by and construed under the laws of the State of Florida, without regard to the choice of law provisions thereof. Venue for any action arising from, or brought to enforce, this Agreement, shall vest exclusively in the state or federal courts located in Duval County, Florida, and the parties agree to submit to the personal jurisdiction of any state or federal court located in Duval County, Florida.

22. ASSIGNMENT

This Agreement shall be binding upon the parties hereto and upon all persons successor in interest to said parties. This Agreement shall not be assignable by AGENCY without the express written consent of CSX.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed as of the day and year first above written.

Agency

_____

Name / Title

Date: _____

CSX TRANSPORTATION, INC.

_____

Name: Will Roseborough
Title: Director, Project Development and Public Projects
Date: _____

APPROVED AS TO FORM AND LEGALITY:

_____

AGENCY Attorney

Date: _____

EXHIBIT A

PROJECT PLANS AND SPECIFICATIONS

EXHIBIT B

INSURANCE REQUIREMENTS

I. Insurance Policies:

Agency and Contractor, if and to the extent that either is performing work on or about CSX's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than $5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured. The policy shall include endorsement ISO CG 24 17 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.

2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than $1,000,000, which insurance must contain a waiver of subrogation against CSX and its affiliates (if permitted by state law).

3. Commercial automobile liability insurance with limits of not less than $1,000,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSX as an additional named insured. The policy shall include endorsement ISO CA 20 70 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.

4. Railroad protective liability insurance with limits of not less than $5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of $10,000,000, which insurance shall satisfy the following additional requirements:

a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.

b. CSX Transportation must be the named insured on the Railroad Protective Insurance Policy.

c. Name and Address of Contractor and Agency must appear on the Declarations page.

d. Description of operations must appear on the Declarations page and must match the Project description.

e. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.

f. Authorized endorsements may include:

(i). Broad Form Nuclear Exclusion - IL 00 21
(ii) 30-day Advance Notice of Non-renewal or cancellation
(iii) Required State Cancellation Endorsement
(iv) Quick Reference or Index - CL/IL 240

g. Authorized endorsements may not include:

(i) A Pollution Exclusion Endorsement except CG 28 31
(ii) A Punitive or Exemplary Damages Exclusion
(iii) A "Common Policy Conditions" Endorsement
(iv) Any endorsement that is not named in Section 4 (e) or (f) above.
(v) Policies that contain any type of deductible

5. All insurance companies must be A. M. Best rated A- and Class VII or better.

6. The CSX OP number or CSX contract number, as applicable, must appear on each Declarations page and/or certificates of insurance.

7. Such additional or different insurance as CSX may require.

II. Additional Terms

1. Contractor must submit the original Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies to:

Insurance Department
CSX Transportation, Inc.
500 Water Street, C-907
Jacksonville, FL 32202

OR

insurancedocuments@csx.com

2. Neither Agency nor Contractor may begin work on the Project until it has received CSX's written approval of the required insurance.

EXHIBIT C

WAIVER AND RELEASE FORM TEMPORARY LICENSE AGREEMENT

_____ shall indemnify and hold CSX Transportation, Inc. ("CSX"), the owner or holder in interest of the tract of real property known as the CSX Transportation right of way under the_____, (the "Property"), harm- less from all claims, damages, demands, causes of action, suits, expenses (including attorney's fees and costs), judgments and interest whatsoever arising from a project to clean up and paint the bridge supports on the Property.

Signature: _____

Date:_____

Note: AGENCY must require any member, volunteer or other person not employed by AGENCY to execute this Waiver and Release Form, Exhibit C, prior to entering CSX property and/or commencing any work on the Project. A copy of all Waiver and Release Forms obtained from any member, volunteer or other person not employed by AGENCY must be sent to:

Julie Skinner
CSX Insurance Analyst
500 Water Street, 14th Floor, Jacksonville, FL 32202
Phone: 904-366-3804

EXHIBIT D

ACCEPTANCE BY AGENCY DESIGNEE

To and for the benefit of CSX Transportation, Inc. ("CSX") and to induce CSX to permit the AGENCY Designee on or about CSX's property for the purposes of performing Work or Spot Painting in accordance with the Agreement dated_____201__, between AGENCY and CSX, AGENCY Designee hereby agrees to abide by and perform all applicable terms of the Agreement, including, but not limited to Exhibit B and Exhibit C to the Agreement, and Sections 2, 3, 7, 8, 11, and 13 of the Agreement. Any notices required to be given to AGENCY Designee shall be in writing and delivered to the person identified below.

AGENCY Designee

By: _____
Print Name: _____
Title: _____
Date: _____

Notices shall be delivered to:
[name and address]

EXHIBIT E

ESTIMATE OF REIMBURSABLE EXPENSES

Attached

APPENDIX

CSX TRANSPORTATION

CSX SPECIAL PROVISIONS

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

DEFINITIONS:

As used in these Special Provisions, all capitalized terms shall have the meanings ascribed to them by the Agreement, and the following terms shall have the meanings ascribed to them below:

"CSX" shall mean CSX Transportation, Inc., its successors and assigns.

"CSX Representative" shall mean the authorized representative of CSX Transportation, Inc.

"Agreement" shall mean the Agreement between CSX and Agency dated as of _____, 20___ amended from time to time.

"Agency" shall mean the _____, _____

"Agency Representative" shall mean the authorized representative of _____, _____

"Contractor" shall have the meaning ascribed to such term by the Agreement.

"Work" shall mean the Project as described in the Agreement.

I. AUTHORITY OF CSX ENGINEER

The CSX Representative shall have final authority in all matters affecting the safe maintenance of CSX operations and CSX property, and his or her approval shall be obtained by the Agency or its Contractor for methods of construction to avoid interference with CSX operations and CSX property and all other matters contemplated by the Agreement and these Special Provisions.

II. INTERFERENCE WITH CSX OPERATIONS

A. Agency or its Contractor shall arrange and conduct its work so that there will be no interference with CSX operations, including, but not limited to: train, signal, telephone and telegraphic services, or damage to CSX's property, or to poles, wires, and other facilities of tenants on CSX's Property or right-of-way. Agency or its Contractor shall store materials so as to prevent trespassers from causing damage to trains, or CSX Property. Whenever Work is likely to affect the operations or safety of trains, the method of doing such Work shall first be submitted to the CSX Representative for approval, but such approval shall not relieve Agency or its Contractor from liability in connection with such Work.

B. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSX's property, Agency or its Contractor shall make such provision. If the CSX Representative determines that such provision is insufficient, CSX may, at the expense of Agency or its Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

C. Should work activities be required within CSX property or right-of-way, the Contractor shall request CSX to locate any buried utilities or facilities (air lines, wells, etc.). A written request shall be delivered to the CSX Representative at least five (5) days in advance. The traditional "One Call" utility locate services are not responsible for locating any CSX undergrade utilities or facilities.

III. INSURANCE

The Contractor shall not be permitted to work on, or have potential to foul, CSX property or right-of-way until CSX has acknowledged written acceptance of the insurance coverages for the proposed project. See PAGE 16 - INSURANCE REQUIREMENTS.

IV. NOTICE OF STARTING WORK

Agency or its Contractor shall not commence any work on CSX Property or rights-of-way until it has complied with the following conditions:

A. Notify CSX in writing of the date that it intends to commence Work on the Project. Such notice must be received by CSX at least ten (10) business days in advance of the date Agency or its Contractor proposes to begin Work on CSX property. The notice must refer to this Agreement by date. If flagging service is required, such notice shall be submitted at least thirty (30) business days in advance of the date scheduled to commence the Work.

B. Obtain authorization, through the Notice to Proceed, from the CSX Representative to begin Work on CSX property. Once authorization is given, Agency or Contractor shall provide a detailed schedule to include means and methods for review, comment and/or approval prior to commencement of work. CSX will in turn provide direction regarding specific conditions with which it must comply.

C. Obtain from CSX the names, addresses and telephone numbers of CSX's personnel who must receive notice under provisions in the Agreement. Where more than one individual is designated, the area of responsibility of each shall be specified.

V. WORK FOR THE BENEFIT OF THE CONTRACTOR

A. No temporary or permanent changes to wire lines or other facilities (other than third party fiber optic cable transmission systems) on CSX property that are considered necessary to the Work are anticipated or shown on the Plans. If any such changes are, or become, necessary in the opinion of CSX or Agency, such changes will be covered by appropriate revisions to the Plans and by preparation of a force account estimate. Such force account estimate may be initiated by either CSX or Agency, but must be approved by both CSX and Agency. Agency or Contractor shall be responsible for arranging for the relocation of the third party fiber optic cable transmission systems, at no cost or expense to CSX.

B. Should Agency or Contractor desire any changes in addition to the above, then it shall make separate arrangements with CSX for such changes to be accomplished at the Agency or Contractor's expense.

VI. HAUL ACROSS RAILROAD

A. If Agency or Contractor desires access across CSX property or tracks at other than an existing and open public road crossing in or incident to construction of the Project, the Agency or Contractor must first obtain the permission of CSX and shall execute a license agreement or right of entry satisfactory to CSX, wherein Agency or Contractor agrees to bear all costs and liabilities related to such access.

1. Temporary construction haul roads across CSX tracks will require a separate application and payment to CSX Property Services. Agreement extensions require additional payment. Actual cost is variable and project specific. Additional information can be found at this URL: https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/permitting-utility-installations-and-rights-of-entry/.\\

B. Agency and Contractor shall not cross CSX's property and tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be permitted pursuant to this section.

VII. COOPERATION AND DELAYS

A. Agency or Contractor shall arrange a schedule with CSX for accomplishing stage construction involving work by CSX. In arranging its schedule, Agency or Contractor shall ascertain, from CSX, the lead time required for assembling crews and materials and shall make due allowance therefor.

B. Agency or Contractor may not charge any costs or submit any claims against CSX for hindrance or delay caused by railroad traffic; work done by CSX or other delay incident to or necessary for safe maintenance of railroad traffic; or for any delays due to compliance with these Special Provisions.

C. Agency and Contractor shall cooperate with others participating in the construction of the Project to the end that all work may be carried on to the best advantage.

D. Agency and Contractor understand and agree that CSX does not assume any responsibility for work performed by others in connection with the Project. Agency and Contractor further understand and agree that they shall have no claim whatsoever against CSX for any inconvenience, delay or additional cost incurred by Agency or Contractor on account of operations by others.

VIII. STORAGE OF MATERIALS AND EQUIPMENT

Agency and Contractor shall not store their materials or equipment on CSX's property or where they may potentially interfere with CSX's operations, unless Agency or Contractor has received CSX Representative's prior written permission. Agency and Contractor understand and agree that CSX will not be liable for any damage to such materials and equipment from any cause and that CSX may move, or require Agency or Contractor to move, such material and equipment at Agency's or Contractor's sole expense. To minimize the possibility of damage to the railroad tracks resulting from the unauthorized use of equipment, all grading or other construction equipment that is left parked near the tracks unattended by watchmen shall be immobilized to the extent feasible so that it cannot be moved by unauthorized persons.

IX. CONSTRUCTION PROCEDURES

A. General

1. Construction work on CSX property shall be subject to CSX's inspection and approval.

2. Construction work on CSX property shall be in accord with CSX's Construction Submission Criteria, latest edition and CSX's written outline of specific conditions and with these Special Provisions.

3. Contractor shall observe the terms and rules of the CSX Safe Way manual, which Agency and Contractor shall be required to obtain from CSX, and in accord with any other instructions furnished by CSX or CSX's Representative. Failure to comply with the terms of the agreement and CSX rules can result in mandatory railroad worker protective training for the Agency, Contractor and its subcontractors.

B. Blasting

1. Agency or Contractor shall obtain CSX Representative's and Agency Representative's prior written approval for use of explosives on or adjacent to CSX property. If permission for use of explosives is granted, Agency or Contractor must comply with the following:

a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of Agency or Contractor.

b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.

c. No blasting shall be done without the presence of an authorized representative of CSX. At least thirty (30) days' advance notice to CSX Representative is required to arrange for the presence of an authorized CSX representative and any flagging that CSX may require.

d. Agency or Contractor must have at the Project site adequate equipment, labor and materials, and allow sufficient time, to (i) clean up (at Agency's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at Agency's expense) any track misalignment or other damage to CSX's property resulting from the blasting, as directed by CSX Representative, without delay to trains. If Agency's or Contractor's actions result in delay of any trains, including Amtrak passenger trains, Agency shall bear the entire cost thereof.

e. Agency and Contractor shall not store explosives on CSX property.

2. CSX Representative will:

a. Determine the approximate location of trains and advise Agency or Contractor of the approximate amount of time available for the blasting operation and clean-up.

b. Have the authority to order discontinuance of blasting if, in his or her opinion, blasting is too hazardous or is not in accord with these Special Provisions.

X. ENVIRONMENTAL

A. Should soil excavation within CSX property be anticipated and said soils cannot remain on CSX property during and after construction, then CSX Environmental must be contacted at least thirty (30) days in advance of the work in order to schedule sampling, classification and disposition of material. Excavated material is prohibited from being removed from CSX property, or rights-of-way, without expressed written direction from CSX. Should final disposition require disposal of excavated material, CSX shall have sole discretion of means and location of said disposal. The project sponsor or Agency will bear all costs associated with sampling, staging and subsequent disposal if deemed necessary. Contractor will be required to obtain all disposal tickets / documentation and provide the information to the CSX Representative. CSX will not bear any costs associated with this work.

B. Any waste materials generated by the Project, including but not limited to washing with cleaning solvents, blasting, scraping, brushing and painting operations, shall be the responsibility of the Agency or its Contractor and shall be contained, collected and properly disposed of by the Agency or its Contractor. Agency and its Contractor agree to fully comply with all federal, state, and local environmental laws, regulations, statutes and ordinances at all times.

XI. MAINTENANCE OF DITCHES ADJACENT TO CSX TRACKS

Agency or Contractor shall maintain all ditches and drainage structures free of silt or other obstructions that may result from their operations. In addition, Agency or Contractor shall maintain all CSX property or right-of-way impacted by project operations including but not limited to; access or haul roads, staging areas, parking lots in a manner that provides CSX free and clear access to facilities, materials while providing acceptable driving surfaces free of drainage impacts or reduced CSX capacity. Agency or Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) hay or straw barrier; (3) berm or temporary ditches; (4) sediment basin; (5) aggregate checks; and (6) channel lining. All such maintenance and repair of damages due to Agency's or Contractor's operations shall be performed at Agency's expense.

XII. TRACK PROTECTION / INSPECTION SERVICE

A. CSX has sole authority to determine the need for track protection required to protect its operations and property. In general, track protection will be required whenever Agency or Contractor or their equipment are, or are likely to be, working within fifty (50) feet of live track or other track clearances specified by CSX, or over tracks.

B. Agency shall reimburse CSX directly for all costs of track protection that is required on account of construction within CSX property shown in the Plans, or that is covered by an approved plan revision, supplemental agreement or change order.

C. Agency or Contractor shall give a minimum of thirty (30) days' advance notice to CSX Representative for anticipated need for track protection. No work shall be undertaken until the flag person(s) is/are at the job site. If it is necessary for CSX to advertise a flagging job for bid, it may take up to ninety (90) days to obtain this service and CSX shall not be liable for the cost of delays attributable to obtaining such service.

D. CSX shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CSX Representative, such inspection may be necessary. Agency shall reimburse CSX for the costs incurred by CSX for such inspection service. Inspection service shall not relieve Agency or Contractor from liability.

E. CSX shall render invoices for, and Agency shall pay for, the actual pay rate of the flagpersons and inspectors used, plus standard additives, whether that amount is above or below the rate provided in the Estimate. If the rate of pay that is to be used for inspector or flagging service is changed before the work is started or during the progress of the work, whether by law or agreement between CSX and its employees, or if the tax rates on labor are changed, bills will be rendered by CSX and paid by Agency using the new rates. Agency and Contractor shall perform their operations that require track protection or inspection service in such a manner and sequence that the cost of such will be as economical as possible.

XIII. UTILITY FACILITIES ON CSX PROPERTY

Agency shall arrange, upon approval from CSX, to have any utility facilities on or over CSX Property changed as may be necessary to provide clearances for the proposed trackage.

XIV. CLEAN-UP

Agency or Contractor, upon completion of the Project, shall remove and dispose from CSX's Property any temporary construction work, any temporary erosion control measures used to control drainage, all machinery, equipment, surplus materials, falsework, rubbish, or temporary buildings belonging to Agency or Contractor. Agency or Contractor, upon completion of the Project, shall leave CSX Property in neat condition, satisfactory to the CSX Representative.

XV. FAILURE TO COMPLY

If Agency or Contractor violate or fail to comply with any of the requirements of these Special Provisions, (a) CSX may require Agency and/or Contractor to vacate CSX Property; and (b) CSX may withhold monies due Agency and/or Contractor; (c) CSX may require Agency to withhold monies due Contractor; and (d) CSX may cure such failure and the Agency shall reimburse CSX for the cost of curing such failure.

APPENDIX

CSX TRANSPORTATION

OVERHEAD BRIDGE CRITERIA

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

CSX Transportation (CSX) has minimum requirements for outside parties constructing, rehabilitating, or replacing bridges over CSX's railroad tracks. These requirements are intended to provide safe and continuous passage of all train traffic during and after construction of bridges over its tracks. Part of these requirements is for the outside party to submit a detailed plan of the project as well as provide details of the construction methodology. This document provides information on the requirements by CSX for overhead bridges.

Plans and specifications for new or reconstructed bridges over CSX's railroad tracks or right-of-way shall meet the following requirements:

I. GENERAL REQUIREMENTS:

A. CSX's valuation station and the distance from the nearest milepost at the intersection of the centerline of the track and the centerline of the bridge shall be shown on the General Plan.

B. The existing and proposed minimum horizontal and vertical clearances shall be marked clearly on the General Plan and Elevation.

C. At least one subsurface exploration boring for each substructure unit adjacent to the track shall be furnished to CSX's during the design submittal. Borings shall provide enough information to design shoring and foundations.

D. Prior to construction activities, all overhead bridge projects will require the procurement of the appropriate property rights from Real Estate and other construction agreement(s) with CSX Transportation.

E. All lifting equipment and connection devices shall have capacity for 150% of the actual lifting load. The factor of safety provided by the manufacturer in the lifting capacity data shall not be considered in the 150% requirement. A licensed professional engineer, familiar with lifting and rigging, in the State where the construction work is proposed must sign and seal all plans and calculations related to critical lifting on the project.

II. CLEARANCES:

A. Horizontal Clearance: Standard horizontal clearance from centerline of the track to the face of the pier or abutment shall typically be 25'-0" or greater, but never less than 18'-0", measured perpendicular to the track. Provisions for future tracks, access roads, other CSX facilities, and drainage may require the minimum clearance be increased or use of multi-span structures. The toe of footings shall not be closer than 11'-0" from centerline of the track to provide adequate room for sheeting.

B. Vertical Clearance: A standard vertical clearance of 23'-0" shall be provided, measured from top of high rail to lowest point of structure in the horizontal clearance area which extends 6'-0" either side of the centerline of track.

C. Temporary Construction clearances to be used shall be subject to approval by CSX. Typically reductions in clearance for construction are not permitted.

D. CSX shall be furnished as-built drawings showing actual clearances as constructed.

III. CRASHWALLS:

AREMA Specifications, Chapter 8, Article 2.1.5 covers the requirements for crashwalls. Crashwalls are required when face of the pier is closer than 25'-0" from centerline of the track, measured perpendicular to the track, except as noted below.

Crashwalls shall meet the following requirements:

A. Crashwalls for single column piers shall be minimum 2'-6" thick and shall extend a minimum of 6'-0" above the top of high rail for piers located between 18'-0" and 25'-0" from the centerline of the nearest track. The wall shall extend minimum 6'-0" beyond the column on each side in the direction parallel to the track.

B. For multi-column piers, the columns shall be connected with a wall of the same thickness as the columns or 2'-6" whichever is greater. The wall shall extend a minimum of 2'-6" beyond the end of outside columns in a direction parallel to the track.

C. Reinforcing steel to adequately anchor the crashwalls to the column and footing shall be provided. For piers of heavy construction, crashwalls may be omitted. Solid piers with a minimum thickness of 2'-6" and length of 20'-0", single column piers of minimum 4'-0" X 12'-6" dimensions or any other solid pier sections with equivalent cross sections and minimum 2'-6" thickness are considered as heavy construction.

IV. DRAINAGE:

Drainage from the bridge shall be preferably collected with drain pipes and drained away from CSX's right-of-way. When open scuppers are provided on the bridge, none shall be closer than 25'-0" of the centerline of nearest track. Flow from the scuppers shall be directed away from CSX's drainage ditches.

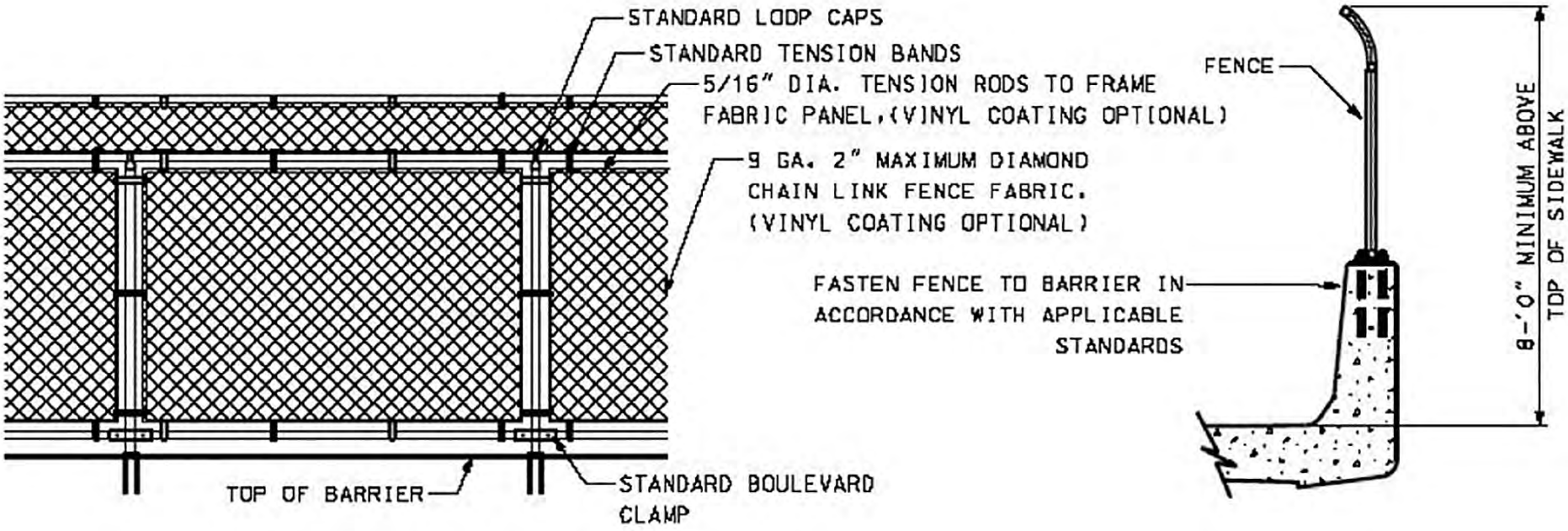
Projects including stormwater systems shall be designed for a 100-year storm event as a minimum. If stormwater is drained on or to CSX's right-of-way, calculations must be submitted to CSX to verify the 100-year storm event is properly handled. Improvements to the adjacent drainage systems may be required at project expense, to ensure the impacted system will meet the 100-year storm event minimum condition.

During and after completion of construction, the outside party or its contractor must clear CSX's drainage ditches of all debris to the satisfaction of CSX's construction engineering and inspection representative.

V. PROTECTIVE FENCING:

All highway structures including controlled access highways shall have a protective barrier fence to extend at least 8'-0" from the top of the sidewalk or driving surface adjacent to the barrier wall. The fence may be placed on top of the barrier wall. The fence shall be capable of preventing pedestrians from dropping debris onto CSX's right-of-way, and in particular, passing trains.

Openings in the fence hall not exceed 2" x 2". Fencing should also include anti-climbshields or be of a configuration to minimize the likelihood of climbing on the outside of the protective fencing. A chain link fence option is shown below:



VI. STRUCTURE EXCAVATION AND SHORING:

Shoring protection shall be provided when excavating adjacent to an active track. Shoring will be provided in accordance with AREMA Manual for Railway Engineering Chapter 8 part 28, except as noted below.

Shoring will not be required if both the following conditions are satisfied:

1. Excavation does not encroach upon a 1 horizontal to 1 vertical theoretical slope line starting at bottom corner of tie (live load influence zone).

2. Track is on level ground or in a cut section and on stable soil.

When the track is on an embankment, excavating the toe of the embankment without shoring may affect the stability of the embankment. Therefore, excavation of the embankment toe without shoring will not be permitted.

Preferred protection is the cofferdam type that completely encloses the excavation. Where dictated by conditions, partial cofferdams with open sides away from the track may be used. Cofferdams shall be constructed using steel sheet piling or steel soldier piles with timber lagging. Wales and struts shall be provided as needed. The following shall be considered when designing cofferdams:

a. Shoring shall be designed to resist a vertical live load surcharge of 1,882 lbs. per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, 8’-6” wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in AREMA Manual for Railway Engineering, Chapter 8, Part 20.

b. Allowable stresses in materials shall be in accordance with AREMA Manual for Railway Engineering, Chapter 7, 8, and 15.

c. A construction procedure for temporary shoring shall be shown on the drawing.

d. Safety railing shall be installed when temporary shoring is within 15’-0” of the centerline of the track.

e. A minimum distance of 10 feet from centerline of the track to face of nearest point of shoring shall be maintained.

The contractor shall submit the following drawings and calculations for CSX's review and approval.

1. Three (3) sets of detailed drawings of the shoring systems showing sizes of all structural members, details of connections, and distances form centerline of track to face of shoring. Drawing shall show a section showing height of shoring and track elevation in relation to bottom of excavation.

2. One set of calculations of the shoring design.

The drawings and calculations shall be prepared by a Licensed Professional Engineer in the State where shoring is to be constructed and shall bear his seal and signature. Shoring plans shall be approved by CSX's construction engineering and inspection representative.

3. For sheeting and shoring within 18'-0" of the centerline of the track, the live load influence zone, and in slopes, the contractor shall use sheet pile. No sheet pile in slopes or within 18'-0" of the centerline of track shall be removed. Sheet piles shall be cut off 3'-0" below the finished ground line. The remaining 3'-0" shall be backfilled and compacted immediately after cut off.

VII. DEMOLITION OF EXISTING STRUCTURE:

The Contractor shall submit a detailed procedure for demolition of existing structures over or adjacent to CSX's tracks or right-of-way. The procedure shall clearly indicate the capacity of cranes, location of cranes with respect to the tracks and calculated lifting loads (refer to Section I.E of this document). The demolition procedure must be approved by CSX's construction engineering and inspection representative.

CSX's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab. As a minimum, both of the following methods shall be used:

A. During demolition of the deck, a protection shield shall be erected from the underside of the bridge over the track area to catch falling debris. The protection shield shall be supported from girders or beams. The deck shall be removed by cutting it in sections and lifting each section out. The protection shield shall be designed, with supporting calculations, for a minimum of 50 pounds per square foot plus the weight of the equipment, debris, personnel, and other loads to be carried.

Large pieces of deck shall not be allowed to fall on the protection shield

B. A ballast protection system consisting of geofabric or canvas shall be placed over the track structure to keep the ballast clean. The system shall extend along the track structure for a minimum of 25'-0" beyond the limits of the demolition work, or farther if required by CSX's construction engineering and inspection representative.

C. The Contractor shall submit detailed plans, with supporting calculations, of the protection shield and ballast protection systems for approval prior to the start of demolition.

D. Blasting will not be permitted to demolish a structure over or within CSX's right-of-way.

VIII. ERECTION PROCEDURE:

The Contractor shall submit a detailed procedure for erecting over or adjacent to CSX's tracks or right-of-way. The procedure

shall clearly indicate the capacity of cranes, location of cranes with respect to the tracks and calculated lifting loads (refer to Section. E of this document). The erection procedure must be approved by CSX's construction engineering and inspection representative.

IX. PILE INSTALLATION:

A. For the installation of piles and sheeting for abutment foundations, pier foundations, retaining wall foundations, temporary and permanent shoring and other structures on or adjacent to CSX's right-of-way, the contractor may be required to submit a detailed track monitoring program for CSX's approval prior to performing any work near CSX's right-of-way.

B. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. CSX shall have the capability of modifying the survey locations and monitoring frequency as needed during the project.

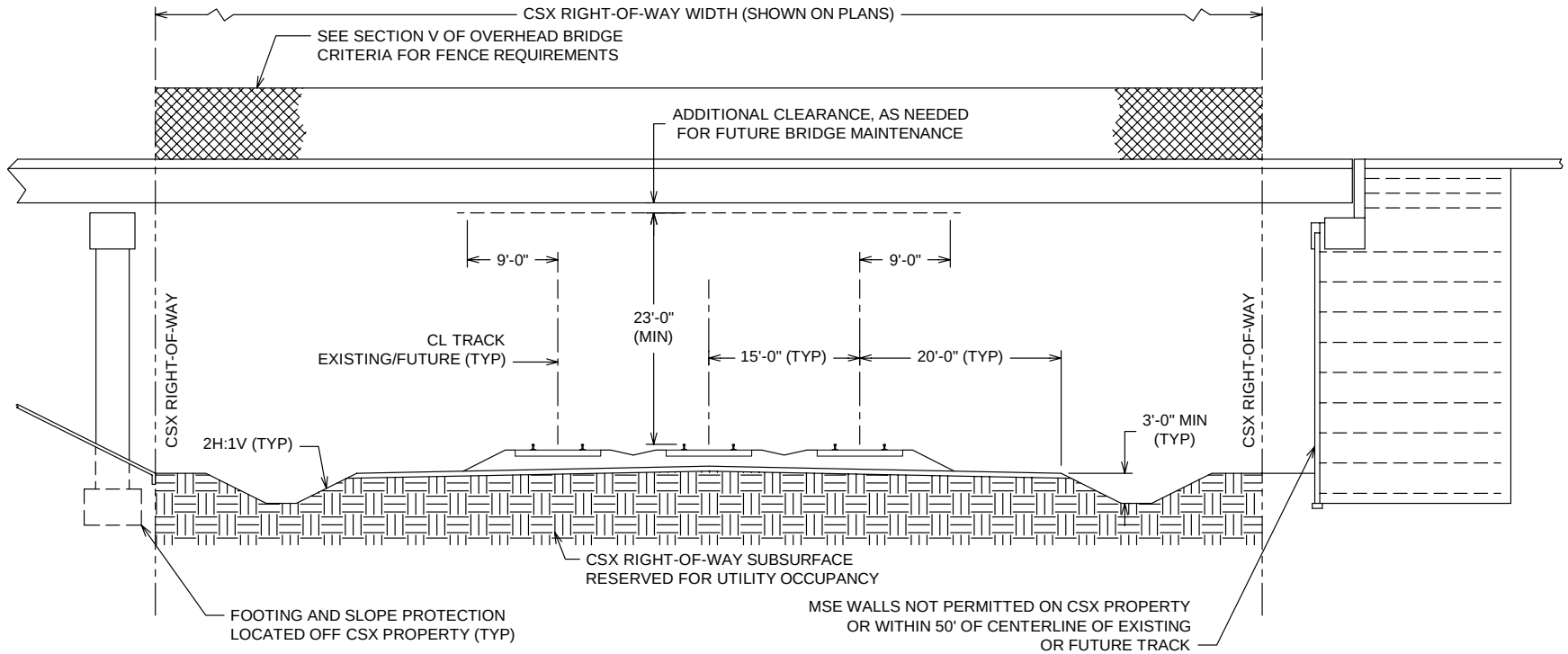
C. If any settlement is observed, CSX's construction engineering and inspection representative shall be immediately notified. CSX, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSX or performed by CSX including the monitoring of corrective action of the contractor will be at project expense.

X. PEDESTRIAN OVERHEAD:

Pedestrian overhead bridges shall be governed by this document in its entirety with the following exceptions:

A. Pedestrian overhead bridges shall span the entire width of CSX's right-of-way. Intermediate piers or other supports will not be permitted.

B. Pedestrian overhead bridges shall be completely enclosed with protective canopy or by other means to prevent users from dropping debris onto CSX's right-of-way.



TYPICAL TRACK CROSS SECTION FOR OVERHEAD BRIDGE DESIGNS

NTS

NOTES:

1. PROPOSED BRIDGES MUST CLEAR SPAN THE CSX RIGHT-OF-WAY. THE PROPOSED SUBSTRUCTURE INCLUDING ANY EMBANKMENT MUST NOT IMPEDE CSX'S ABILITY TO UTILIZE THE FULL RIGHT-OF-WAY. ANY IMPEDANCE ON CSX RIGHT-OF-WAY WILL BE SUBJECT TO ADDITIONAL REVIEW AND WRITTEN APPROVAL.
2. HORIZONTAL DIMENSIONS SHOWN ARE PERPENDICULAR TO ℄ OF TANGENT TRACK. INCREASES MUST BE PROVIDED FOR THE EFFECTS OF CURVATURE AND SUPERELEVATION.
3. ADDITIONAL VERTICAL CLEARANCE MAY BE REQUIRED TO ALLOW FOR ADJUSTMENT OF SAG IN VERTICAL CURVES (TOP OF RAIL SURVEY REQUIRED 1,000' IN EACH DIRECTION), FLOOD CONSIDERATION, AND BRIDGE CONSTRUCTION/MAINTENANCE PURPOSES.
4. ALL DRAINAGE MUST BE DIRECTED AWAY FROM CSX PROPERTY.
5. CRASHWALLS MAY BE REQUIRED BASED ON SITE SPECIFIC PARAMETERS (SEE SECTION III OF OVERHEAD BRIDGE CRITERIA).
6. THEORETICAL TOE OF SLOPE IS BASED ON THE STANDARD ROADBED SECTION. ACTUAL TOE OF SLOPE MAY VARY DUE TO EXISTING GROUND LINE.
7. THE DITCH SECTION SHOWN IS THE MINIMUM ACCEPTABLE SECTION. THE DITCH SECTION IS TO BE INCREASED AS REQUIRED BY LOCAL CONDITIONS, BASED ON HYDROLOGICAL AND HYDRAULIC STUDIES.
8. CSX RESERVES THE RIGHT TO USE THE ENTIRE WIDTH OF THE RIGHT-OF-WAY FOR CURRENT AND FUTURE UTILITIES.

REVISIONS		
DATE	LTR.	DESCRIPTION

CSX

PUBLIC PROJECTS MANUAL
TYPICAL DRAWINGS

OVERHEAD BRIDGE DETAILS
PERMANENT CLEARANCES

REF. NO.: N/A

DATE: MARCH 5, 2025 | DRAWING NO.: 1

Filename: C:\USERS\AMSLER.JA\ECOM\CSX - PROJECT FOLDER\400-TECHNICAL\CSX_CRITERIA\PUBLIC PROJECTS MANUAL\WORKING\GRAPHICS\OHB01_OVERHEAD BRIDGE DETAILS - PERMANENT CLEARANCES.DWG

APPENDIX

CSX TRANSPORTATION

CRITERIA FOR UNDERGRADE RAILROAD BRIDGES

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

INTRODUCTION

SECTION I: General Design

SECTION II: Design Loads

SECTION III: Construction Material Requirements

SECTION IV: Clearances

SECTION V: Superstructure

SECTION VI: Substructure

SECTION VII: Bridge Layout

SECTION VIII: Plan Preparation and Submittals

SECTION IX: Construction Considerations

EXHIBIT A

Typical Sections and Details:

CSX Standard 2604 – Clearance Diagrams
CSX Standard 2703 – No Trespassing Sign
CSX Standard 2802 – Bridge Number Signs
Typical Track Geometry and Clearances
Steel Superstructure with Steel Deck
Steel Superstructure with Concrete Deck
Through Plate Girder
Inspection Walkway System
Steel Deck Drain Detail

INTRODUCTION

Undergrade railroad bridges are generally considered railroad structures over the roadways or other non-railroad crossings. New bridges designed and built by outside forces have the responsibility to deliver a quality product that aligns with CSX best practices for common railroad-performed future maintenance tasks, serviceability to the network, and expected performance life. This section outlines CSX-recognized guidelines for designers and contractors to deliver railroad structures while meeting CSX expectations and specifications.

I. GENERAL DESIGN

The AREMA Manual for Railway Engineering (MRE) shall serve as the overarching authority for, and recommended practice in the design, fabrication, and construction of CSX railroad bridges. The intent of this document is to provide criteria which supplements, modifies and/or supersedes the applicable sections of the AREMA MRE for designing undergrade railway bridges which are to be owned and/or operated on by CSX. Additionally, these requirements help guide an outside party through the necessary procedures for interacting with CSX and delivering an acceptable structure that is constructible, inspectable, maintainable, long lasting, and reliable.

A. The bridge shall be designed in accordance with the applicable chapter, parts, and sections from the current edition of the AREMA MRE. Applicable chapters may include, but are not limited to, the following:

- Chapter 8 Concrete Structures and Foundations
- Chapter 9 Seismic Design for Railway Structures
- Chapter 15 Steel Structures

B. Only simple spans with ballasted decks are allowed. Acceptable superstructure types are described in Section V: “Superstructures” of this Appendix. Design shall incorporate typical standard details common to CSX.

C Design and construction shall be in accordance with requirements outlined in this Appendix. The requirements in this document shall be supplemented by the AREMA MRE recommendations for fabrication and erection.

D. Bridge low chords shall pass the 100 year 24 hour storm/flood event with an additional 2 feet of freeboard.

E. Items not covered by this Appendix shall be governed by applicable highway specifications from the Commonwealth, District, Province, or State where the bridge is being constructed.

F. Any proposed deviation(s) from this criteria shall be submitted in writing to the CSX Public Projects Manager for review and approved by the CSX Chief Engineer - Design and Construction.

G. Consultants to submit a TS&L (Type, Size, and Location) plan sheet (1 sheet) for review to the CSX Public Projects Manager. After review and acceptance, design work can proceed to 30% completion. Designs which do not meet the requirements as prescribed by this document should not progress beyond 30% without CSX’s written approval. Else, the design will be considered 30% complete by CSX regardless of the Applicant’s percentage of completion.

H. Bridge superstructures and substructures shall be designed for a minimum design service life of 100 years. This may be addressed by, but not limited to, the following:

1. Additional sacrificial steel thickness added to flanges and webs of primary bridge members of steel superstructures over that which is required by design. See reference part III – Construction Material Requirements, Section C – Structural Steel Requirements, Part 1 – Material Properties.

2. A corrosion protection plan that includes additional cover for mild reinforcement, low permeability concrete mixes, concrete penetrating sealers, and durability testing.

I. Reference “Construction Submission Criteria” Appendix in this manual for other construction considerations.

J. All railroad bridge projects shall include a signed and sealed load rating analysis report, considering the As-Built conditions.

II. DESIGN LOADS

The proposed Undergrade Railroad Bridge shall be designed for the following loads:

A. Dead load shall include up to 3’-7” of ballast from top of deck to the top of tie and all other applicable dead load. The 3’-7” accounts for 7” tie height, 1’-0” minimum below tie, plus an additional 2’-0” of future ballast.

B. Live loads:

1. Steel structures shall consider both the Cooper E-90 loading and the Alternate Live Load with full diesel impact; whichever produces the greater stress.

2. Multiple track structures shall calculate live load based on the assumption that the track(s) can be located anywhere on the bridge with a maximum track spacing of 13’-0”.

3. Multiple track structure design assumes that trains will operate on all tracks at any given time.

C. Seismic loading shall be considered as required between the Caltrans or governing legislation, whichever is most restrictive.

D Additional loads shall be applied as specified in the AREMA MRE Chapters 8, 9, and 15, as applicable.

E. Load Application Assumptions:

All bridges shall be designed assuming non-composite interaction between the superstructure and the deck. Adequate connection between deck and superstructure shall be provided to ensure appropriate load transfer.

III. CONSTRUCTION MATERIAL REQUIREMENTS

Design and Construction requirements for structural materials are outlined below. Deviations from, and use of items not addressed specifically in this document require CSX written approval.

A. Concrete Requirements

Concrete shall conform to the following minimum specifications, except as otherwise noted:

1. Concrete shall have a minimum compressive strength of 5,000 pounds per square inch at 28 days.

2. Cement shall conform to the following:

   i. Fly ash is prohibited in concrete unless approved by CSX. If approved, silica fume or fly ash shall not be used to reduce the quantity of cement.

   ii. For standard concrete - Cement shall be Portland cement, type I, IA or II, conforming to the requirements of ASTM C150. Alternatively, the use of Portland-limestone cement (PLC) Type IL, conforming to the requirements ASTM C595, must be approved by CSX. Specify blended cement percentage.

   iii. For high-early strength concrete - Cement shall be Portland cement, Type III or IIIA, conforming to the requirements of ASTM C150. Alternatively, the use of Portland-limestone cement (PLC) Type IL(10) or Type IL(10) A, conforming to the requirements ASTM C595, must be approved by CSX.

3. Cement content shall be 7.0 minimum to 8.0 maximum sacks of cement per cubic yard of concrete.

4. Air content shall be 5%-7% (by volume) unless otherwise approved by CSX. Air-entraining admixture shall conform to the requirements of ASTM C260.

5. Admixtures, other than air entrainment, shall not be used without approval by CSX.

6. Exposed surfaces shall be formed in a manner which shall produce a smooth and uniform appearance without rubbing or plastering. All concrete corners/edges shall have a 3/4” chamfer provided unless otherwise noted on the plans or where embedded plates are located. The top surface is to have a smooth finish, free of all float or trowel marks.

7. Concrete water repellent and curing compound shall meet the following requirements:

   i. Water repellent material shall consist of a silane based, one part liquid penetrating sealer, in accordance with AREMA Chapter 8, Part 1 and in conformance with applicable ASTM designations.

   ii. Water repellent shall be applied to curbs, top and sides of bent caps, and top and sides of wingwalls.

8. For precast elements, the fabricator shall stencil the fabricator’s name, date of fabrication, the bridge number, lifting weight, and piece mark on each component. Stencil shall be placed in such a manner to be visible from the installed position.

9. The production facility must be pre-certified. Production procedures for the manufacture of precast members shall be in accordance with the AREMA MRE and the current edition of the Precast Concrete Institute's Manual MNL 116 for Quality Control.

10. The area around all lifting loops shall be recessed so that the loops can be removed to a depth of 3/4" and grouted. Properly designed lift anchors are acceptable in lieu of lifting loops.

11. The fabricator will be responsible for loading and properly securing the precast concrete members for shipment via rail, barge, or truck. All concrete components shall be made available, at CSX's discretion, for inspection by the Engineer-of-Record and CSX at the fabricator's plant prior to shipment.

12. Block outs used to create internal voids in a precast concrete member shall be securely tied down to prevent displacement during concrete placement. Tie block outs to rebar, NOT prestressing strands.

B. Reinforcing Steel Requirements

Fabrication, bending and placement of reinforcing steel and dowel bars shall be in accordance with Chapter 8 of the AREMA MRE, current edition and conform to the following minimum specifications, except as otherwise noted:

1. Reinforcing steel shall be deformed, new billet bars per current ASTM A615 Specifications and meet Grade 60 requirements.

2. All dimensions for reinforcing bars refer to the centerline of the bar except in the bar bending details where dimensions are out-to-out.

3. Bars shall be free from dirt, paint, oil, grease, rust and other foreign substances.

4. Reinforcing bars shall meet the lap requirements of Chapter 8 of the AREMA MRE, current edition.

5. Mechanical splices are not permitted unless approved by CSX. If approved, the mechanical splice shall fully develop the strength of the reinforcing bar, and shall be certified by the manufacturer.

6. Bars shall be bent in accordance with Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice.

7. Reinforcing is to be blocked to proper location and securely wired against displacement. Tack welding of reinforcing is prohibited. Minimum concrete cover not otherwise noted shall meet current AREMA MRE Chapter 8 recommendations.

8. For on-site reinforcing steel storage, dunnage shall be provided. Reinforcing bars shall be off the ground and away from mud, dirt, and other contaminants.

9. Reinforcement supports shall be made entirely of plastic or stainless steel.

C. Structural Steel Requirements

All Structural Steel shall conform to the following minimum specifications, except as otherwise noted:

1. Material Properties

i. Rolled steel and Built-Up Steel members shall be ASTM A709, Grade 50. 70 ksi or higher strength steel is prohibited.

ii. Commonly rolled and available standard steel shapes as made available in the AISC Manual of Steel Construction are preferred for structural components. Built-up members are permitted subject to CSX approval.

iii. Plate Flanges shall not exceed 3" in thickness.

iv. Minimum steel thickness shall be ½" even if calculations determine otherwise. Additionally, all steel material shall be 1/8" greater in thickness than determined by calculation.

v. Pipe pile steel shall be ASTM A252, Grade 3 (Modified 50 ksi).

vi. H-Pile steel shall be ASTM A690.

vii. Sheet Pile steel shall be ASTM A572, Grade 50.

viii. H-Pile splices shall conform to ASTM A992 or ASTM A572, Grade 50.

2. All structural steel shall be painted with a 3-coat system, including weathering steel.

i. Clean surfaces in accordance with SSPC-SP6, current edition. Paint shall be applied in accordance with SSPC-PA1, current edition.

ii. Paint Systems: The products of one coating system from a single manufacturer shall be used for shop and field coating work. Do not mix coating systems or products of different manufacturers.

iii. Hot-Dip Galvanizing: The zinc for Hot-Dip Galvanizing shall be Special High Grade (SHG), conforming to ASTM B6, Specification for zinc.

iv. Color for paint systems: The color of the topcoat steel shall be Federal Standard 595 Color – FS16473 Aircraft Gray.

v. Shop Coating – Paint System: Inorganic zinc-rich primer/epoxy intermediate/urethane finish coating system.

1. This system shall be shop applied to all bridge surfaces designated for coating with the exception that contact surfaces of field connections be shop primed with inorganic zinc rich primer only. After all bridge surfaces have been primed with one coat of inorganic zinc rich primer, all field connection surfaces shall be masked off. A full coat of the epoxy intermediate shall then be applied followed by a stripe coat of that same epoxy intermediate coating to all edges, crevices, and other irregularly shaped surfaces. Following the full and stripe coats of epoxy intermediate, a full urethane finish coat shall be applied.

2. After bridge erection is complete, field coating using this system shall be performed on all damaged areas, all field connections, all fasteners, and any other areas not coated in the shop. Surface prep shall be in accordance with SSPC-SP2 or SSPC-SP3.

3. One of the following coating systems shall be selected and applied:

MANUFACTURER	FIRST COAT (DFT)	SECOND COAT (DFT)	THIRD COAT (DFT)
Carboline Company	Carbozinc 11 HS (2.0 to 3.0 mils)	Carboguard 885 (3.0 to 5.0 mils)	Carbothane 134 HG (2.0 to 2.5 mils)
International	Interzinc 22 HS (2.0 to 3.0 mils)	Intergard 475 HS (4.0 to 6.0 mils)	Interthane 990 HS (2.0 to 3.0 mils)
PPG-Protective and Marine Coatings	Dimetcote 9 (2.0 to 4.0 mils)	Amercoat 385 (4.0 to 6.0 mils)	Amercoat 450H (2.0 to 3.0 mils)
Sherwin-Williams	Zinc Clad II Plus B69VZ12/B69BZ13/B69D11 (2.0 to 4.0 mils)	Recoatable Epoxy B67A5/B67V5 (4.0 to 6.0 mils)	Hi-Solids Polyurethane B65 300/B60V30 (3.0 to 4.0 mils)

4. All bridges shall be coated with a sealer and anti-graffiti coating. The sealer and anti-graffiti coating shall be compatible with the paint coating system.

3. Welding Requirements

i. Welds and welding procedures shall be in accordance with the American Welding Society (AWS) Bridge Welding Code D1.5, current edition and all addenda.

ii Welded Connections:

1. Only submerged arc welding (SAW), shielded metal arc welding (SMAW), or flux core arc welding (FCAW) may be used. If FCAW is used, it shall be gas shielded with 71-T1 electrodes unless otherwise approved. Any other process must be approved by CSX.

2. Welding electrodes for arc welding shall meet the current requirements of the AWS Bridge Welding Code. As noted above, if FCAW is used, the electrodes shall be 71-T1.

4. Bolting Requirements

i. Bolts shall conform to ASTM F3125, grade A325, high strength, Type 1 bolts. Grade A490 Bolts are not permitted.

ii. Nuts shall meet the current requirements of ASTM A563 Specifications.

iii. Washers shall meet the current requirements of ASTM F436 Specifications.

iv. Bolted connections shall be made with 7/8” diameter bolts.

v. All bolted structural members shall have a minimum of three (3) bolts at each connection face.

vi. All 7/8” diameter bolts shall be tightened to a minimum tension per bolt of 39,000 lbs. A bolt tension calibrator is to be used to verify minimum tension.

vii. All shop bolt holes shall be sub-drilled and reamed or drilled from the solid. At no time are holes to be sub-punched and reamed or punched full size. All holes shall be 1/16” larger than the specified bolt size unless noted otherwise.

viii. All bolt holes that require field drilling shall be drilled from the solid. At no time are holes to be torch cut or produced by other means and methods. Oversizing holes for field fit up shall be done by reaming using a fluted reamer with a tapered shank. Reamer diameter shall be 1/16” larger than the specified bolt diameter. Holes, new or enlarging, made by use of cutting torch is cause for rejection of the entire member.

IV. CLEARANCES

Permanent clearances shall be maintained at all times. Construction phasing and means and methods shall ensure permanent clearances are maintained during construction. Permanent clearances protect the structure from oversized or unauthorized loads by providing sufficient clearance and protective devices.

A. Under Bridge Vehicular Clearances (Permanent Vertical Clearance Under the Structure)

1. Undergrade structures shall be designed to ensure that the structure will be protected from oversized or unauthorized loads by providing sufficient vertical clearance and protective devices. Provide a minimum vertical clearance over the entire roadway width for all new or reconstructed structures as follows:

i. 16'-6", including any future wearing surfaces, for steel superstructures with 5 or more rolled beams or 4 or more deck plate girders per track.

ii. 17'-6", including any future wearing surfaces, for steel through plate girders or less than 4 deck plate girders per track with bolted bottom flanges.

iii. 20'-0", including any future wearing surfaces, for steel through plate girders or less than 4 deck plate girders per track with welded bottom flanges.

iv. Concrete superstructures are not permitted over any span of a roadway crossing.

v. Vertical clearance must not be violated due to the deflection of the superstructure.

2. Variance from vertical clearances defined above shall require prior review by CSX. The variance required shall provide exhaustive justification. Cost shall not be the determining factor.

3. Roadway profile and roadway design vehicle information shall be provided and considered in vertical clearance design. If resurfacing or any other activity is to be performed below the undergrade structure, the owner of the roadway must submit a request for approval from CSX. This request must provide the existing measured and posted clearances of the structure and the proposed configuration after work is completed.

B. Permanent Horizontal and Vertical Bridge Clearances (on the structure)

Permanent horizontal and vertical clearances on an undergrade structure shall conform to the requirements of the AREMA MRE, Chapter 15, Part 1 and the following:

1. Standard clearances on the bridge shall not be modified without written notice of approval by the CSX Chief Engineer – Design & Construction. Any proposed modification shall be furnished with detailed engineering justification for review.

2. Commonwealth, District, Provincial, or State clearance laws must not be violated. Legal requirements must be upheld, unless written permission for waiver is provided by the appropriate regulatory authority.

3. Adequate clearance, structural geometry, and capacity shall be provided for a future track and future vertical track raises. The structure shall not require modifications to accommodate the additional 2'-0" of future ballast.

4. Track centers shall not be closer than 15’-0”.

5. Standard clearances shown are for tangent track. Increases in clearances must be provided to account for effects from curvature and superelevation as per CSX Standard Drawing 2604.

6. Minimum horizontal clearance on the bridge shall be provided as shown in Exhibit A – “Typical Track Geometry and Clearances”.

C. Sacrificial Impact Protection Devices

CSX must approve vertical clearances in violation of Section IV.A: “Under Bridge Vehicular Clearances”. All CSX approved exceptions must adhere to the following guidelines for Sacrificial Impact Protection Devices:

1. All structures with vertical clearances less than defined in Section IV.A: “Under Bridge Vehicular Clearances” shall be protected with a sacrificial device on each side of the structure.

2. Sacrificial beam shall be placed at least 1” below the low chord of the main structural bridge.

3. Protection shall be in the form of a redundant steel fascia beam and must be adequately anchored to the bridge seat.

4. The sacrificial beam shall not be connected to the structural beams via diaphragms.

5. The sacrificial beam deflection from impact, if struck, shall be considered for the beam’s placement in front of the main structure to avoid damage to the main structural members.

V. SUPERSTRUCTURE

Permanent clearances shall be maintained at all times. Construction phasing and means and methods shall ensure permanent clearances are maintained during construction. Permanent clearances protect the structure from oversized or unauthorized loads by providing sufficient clearance and protective devices.

A. General Span Arrangement

1. All bridges shall be comprised of simple spans. Continuous spans are prohibited.

2. Skewed bridges shall be avoided, and all framing shall be orthogonal. Severe skews shall be avoided even at the expense of providing longer spans or making changes in the roadway alignment. Site conditions may not allow the complete elimination of bridge skew, but skew elimination shall be considered and presented to CSX for approval.

3. Superstructure designs shall provide accommodations for inspection, future maintenance, and bearing replacements.

B. Acceptable Superstructure Types

All railroad bridge replacements shall reduce the number of spans of a given bridge asset where feasible. Single span bridges are ideal. Piers or bents may be provided after other design options have been exhausted. The following is a list of undergrade structure types that are acceptable to CSX and listed in the order of preference. CSX’s preferred superstructure type is the highest listed feasible alternative unless a detailed type selection report provides justifications that a lower listed alternative is more beneficial to CSX and to the project.

1. Rolled Beams with steel deck. There shall be at least 5 beams per track.

2. Built Up Girders with steel deck. There shall be at least 5 beams per track.

3. T hrough Plate Girders with steel deck will be considered by CSX when conditions preclude any other structure types.

4. Rolled Beams with concrete deck. There shall be at least 5 beams per track.

5. Built Up Girders with concrete deck. There shall be at least 5 beams per track.

6. Undergrade structures of deck truss or through truss design are discouraged. However, in unusual circumstances, they will be considered by CSX if conditions preclude the use of any other type of structure.

7. Where possible, use of Railroad standard span details are encouraged. Railroad standard spans are composed of rolled W section beams, W section diaphragms, and a concrete ballasted deck.

Note: Concrete box beams, concrete girders, and concrete slab superstructures are not permitted.

C. Deck Requirements

All bridges are designed to assume non-composite strength. Mechanical connections shall be provided as necessary to provide adequate load transfer between the deck to the superstructure.

1. Deck Type – The deck shall be a uniform ballast pan across all tracks. Intermediate curbs shall not be permitted. The deck must be designed to prevent ballast or other material from falling through.

2. Deck Width – The deck width shall be a function of future track, access road, existing track(s), minimum horizontal clearances and minimum of 15’-0” spacing between centerlines of tracks and ballasted walkways. Ballasted walkways shall occur between all tracks and on the field side of the exterior track.

3. Parapet Walls – All bridge deck limits shall be equipped with minimum 6’-0” tall continuous parapet walls on each fascia measured from the top surface of the bridge deck to the top of wall and allow for a minimum 3’-6” height from top of ballast to top of wall when considering future ballast. Parapet walls shall include two (2) 6” conduit ducts on each parapet to accommodate signal and utility needs.

4. Ballast Depth – The minimum required depth of ballast shall be 1’-0” measured from the top of the deck waterproofing to the bottom of the tie, at the centerline of the low rail. This dimension shall be clearly labeled on the contract drawings, cross section views.

5. Ties – Timber crossties measuring 7” tall x 9” wide x 8’-6” long shall be used. Ties are to be spaced at 1’-8” centers. Alternatively, concrete crossties may be used also at 1’-8” centers, or steel crossties may be used at 2’-0” centers.

6. Track Material – Track material such as rail, plates, spikes, et cetera shall be subject to review by CSX or provided by CSX at project expense.

7. Inside Guardrail – Inside guard rails are required across the following bridge span types:

i. Through truss

ii. Pony truss

iii. Deck trusses on towers

iv. Deck plate girders (for spans over 100’-0”)

v. Movable spans and other structures as designated by CSX

Contact CSX to receive the guardrail standards. The use of these span types are subject to railroad approval.

D. Concrete Deck

Cast-In-Place concrete decks are preferred. However, precast concrete decks are permitted. Both types of concrete decks shall conform to the following requirements:

1. The bridge deck shall have adequate anchorage to the bridge superstructure. Shear studs shall not be permitted.

2. The outside edge of the slab shall be not more than 1’-6” from the centerline of the outside (fascia) girder.

3. Provide a drip edge on the outside edge, bottom face of the deck slab.

4. Concrete deck to include ballast mat and waterproofing.

E. Steel Deck

1. Steel deck plates shall be shop welded with a pair of 5/16” continuous fillet welds to each floor beam or deck girder. Deck units shall be shop assembled with multiple beams per unit, and areas to be field welded shall be masked and field painted after welding is complete.

2. The closing deck plate between adjacent deck units shall be fillet welded to the beams with continuous 5/16” fillet welds at each beam. After deck plates are welded to the beam, fill space between deck plates at joint with material compatible with deck waterproofing membrane.

3. The minimum thickness of steel deck plates shall be 1”.

4. For multiple deck girders with steel deck plates:

i. Provide a welded field splice in the deck plate at or near the centerline of bearing of the girders. Provide a closing deck plate from the abutments to this field splice that is normal to the girders and normal to the long direction of the main deck plates. This will avoid splicing deck plates over the back wall.

ii. Outside girders shall be spaced such that deck plates will not overhang the flange of the outside girders by more than 2” and a steel parapet wall shall be provided. The wall shall be securely anchored to the deck girder and have a minimum width of 1’-0” at the top.

5. Steel deck to include Ballast Mat and Waterproofing.

F. Ballast Retainers, Fences and Handrails

1. Ballast retainers must be designed to prevent ballast from falling on the roadway.

2. If the parapet walls do not meet FRA requirements, handrails shall be provided on both sides of the deck as well as off both ends of the bridge to ensure safe walking access.

3. Fencing may be included where required by the Applicant or CSX. Handrails and fences shall be simple designs that require minimum maintenance and shall meet the criteria presented in Section IV: “Clearances” of this Appendix.

G. External Walkway

1. External walkways are discouraged and require CSX approval.
2. The ballast section may be used as walkway at the discretion of CSX provided that the clear distance from centerline of track to the ballast retainer is a minimum of 9’-0”.

3. The walkways shall be constructed of solid material and a curb or toe board shall be provided at a height of 4” from top of walkway.

4. To prevent cracking under live loads, 1/4” control joints shall be provided in concrete curbs, concrete walkways and concrete ballast retainers and shall be spaced at 10’-0” or less for the lengths of the structure.

5. When walking structures are used, provide a detail showing the walkway transition from bridge to roadbed at the bridge ends. Where there is a vertical distance from the roadbed walking surface to the bridge walkway, adjust the roadbed walkway profile to eliminate the vertical separation or provide other means to provide a safe transition. The design shall not restrict drainage at the abutments and shall be submitted to CSX for review.

H. Drainage

Inadequate drainage facilities can severely limit the life span of the superstructure. The following drainage requirements shall be met:

1. The top surface of waterproofing protection shall have a minimum transverse slope of 1/8” per foot with a crown at the centerline of the deck.

2. The top surface of waterproofing protection shall have a minimum longitudinal slope of 0.5%.

3. The designer may provide drainage toward one end of the structure, or when the structure’s length is excessive, provide adequate deck grades and deck drains to drain the structure to both ends.

4. All deck types shall be designed and constructed to provide the required slopes and to direct water to deck drains.

5. When the deck is level or slopes less than 0.5%, underlayment is to be used to provide required slopes.

6. Deck drains shall be cast iron and downspouts shall be galvanized steel. Deck drains shall have a grate or perforated cover. Downspouts shall be provided with cleanouts at each change in direction. See Exhibit A –"Steel Deck Drain Detail".

7. Deck drains shall not discharge on other bridge elements or traffic passing underneath the structure.

I. Ballast Mat and Waterproofing

1. Materials for ballast mat and waterproofing and the construction and installation shall be in accordance with the AREMA MRE, Chapter 8.

2. All bridge decks shall use ballast mat "ATP-DR Ballast Mat Type 4" by Progress Rail or approved equal.

3. Spray applied ballast protection mat shall be a minimum of 250 mils.

4. All bridge decks shall be waterproofed using membrane waterproofing. Waterproofing shall be a two-component, sprayable polyurea, 100% solids elastomeric coating. TuffGrip HP11-90, manufactured by Rhino Linings is the preferred material or equal alternative.

5. Waterproofing membrane shall be a minimum of 120 mils.

6. Waterproofing system shall be UV stabilized.

7. Waterproofing shall be applied to the entire surface of deck and bottom 3'-0" of inside faces of parapets.

8. All deck joints between spans shall be watertight.

9. Waterproofing installation shall be observed and approved by the manufacturer's representative.

J. Steel Superstructure

The steel superstructure shall be designed per the AREMA MRE, Chapter 15, unless otherwise required by CSX or herein.

1. Fracture critical member material, fabrication, welding, inspection and testing shall be in accordance with the AREMA MRE, Chapter 15.

2. The diameter of high strength bolts shall be 7/8".

3. Bolted joints shall be strictly designed as slip critical only.

4. Splices shall be avoided. When splice locations are required, the location of the splice shall account for future maintenance and access. Final splice details and location must be approved by CSX.

5. CSX requires all structural elements to be designed with additional sacrificial thickness for future corrosion. Sacrificial thickness shall be at least 1/8".

6. All structural steel members must have a minimum thickness of ½".

7. Diaphragms or cross frames shall be provided for all steel spans as required.

8. Mechanisms providing for jacking of spans are required for all steel structures at bridge seats. Design and details shall provide accommodation for future maintenance.

9. All end diaphragms require jacking stiffeners. Ensure adequate vertical clearance is provided between the bridge seat and the diaphragm for future jacking and maintenance. Jacking locations as well as jacking loads shall be specifically denoted and called out in the bridge plans. Jacking loads shall be sized to accommodate full dead load of the structure, including future ballast.

K. Rolled Beams

1. Coping and other member modifications for primary members are not allowed.

2. Connections to rolled members shall be bolted. Welding is not permitted.

L. Welded Plate Girders

1. Built-up girder and beam sections shall utilize welds per AREMA Chapter 15.

2. Flange width and thickness must be continuous along the length of the girder. Flange transitions are not permitted.

3. When a lateral bracing system is required, girder connections shall be bolted.

4. Bearing stiffeners shall be welded to both top and bottom flanges with CJP groove weld, or mill-to-bear.

5. End Diaphragms shall have access holes for accessibility to the bearings and backwalls.

6. Inspection walkways shall be included between any girders which have a depth of 5'-0" or more beneath the deck.

M. Through Plate Girders

1. Through plate girder bridges are only permitted upon CSX approval.

2. The use of intermediate girders is discouraged due to interference with track maintenance.

3. All stringers shall frame into floor beams.

4. Intermediate floor beams shall frame into the girder web using double connection angles and high strength bolts.

5. End floor beams shall be provided, and connections shall be designed such that the bridge can be jacked up by placing jacks between the end floor beams and pier or abutment. Jacking stiffeners shall be provided at points of jacking.

6. All stringers shall have top and bottom flanges clipped at an angle not greater than 45 degrees to permit future field removal and installation.

N. Concrete Superstructure

Concrete superstructures shall not be considered for undergrade railroad bridges.

O. Bearings

Bearings shall be designed per the AREMA MRE Chapter 15 part 5.

1. Elastomeric bearings are not permitted for use on CSX undergrade railroad bridges.

2. Provisions for the replacement of bearings shall be considered in the design. Bridges shall be designed to accommodate cyclical bearing replacement through jacking operations.

3. Each type of bearing system or component has differing characteristics and capacities to accommodate or restrain translational and rotational movements and to resist vertical and horizontal loads. The bearing type chosen for a particular bridge application must have adequate load and movement capabilities. Acceptable bearing types are as follows:

i. Rocker Plate Bearing

ii. Spherical Bearing

iii. Rocker Pedestal

iv. Fixed Pedestal

v. Multi-Rotational Disc Bearing (applicant to maintain)

vi. Multi-Rotational Spherical Bearing (applicant to maintain)

vii. Roller Nest with Ovaloid Rollers with Pintels and Keeper Plates (applicant to maintain)

VI. SUBSTRUCTURE

Design and Construction requirements for structural materials are outlined below. Deviations from, and use of items not addressed specifically in this document require CSX written approval.

A. Foundations

1. Footings for all substructures shall be located and designed to allow a minimum of 12’-0” measured perpendicular from centerline of nearest active track to face of shoring to facilitate footing construction.

2. Cross-hole Sonic Log (CSL) Testing is required for every drilled shaft to evaluate the integrity of drilled shafts/caissons. The Plans and Specifications shall include provisions for this testing. CSL tube testing pipe shall be steel. Other testing methods may be necessary, as required by CSX.

3. Drilled shafts within the influence of live load, track, and soil surcharge shall be designed with permanent or temporary casing for protection against cave-in, subsidence and or displacement of surrounding ground. Casing shall be designed for live load due to the railroad surcharge in addition to all other applicable loads. Drilled shafts shall be designed to allow the drilling operation to proceed without impacting the railroad operation.

B. Abutments and Wing Walls

1. The minimum abutment width shall be sufficient to provide for 15'-0" track centers, and a standard roadbed section. For multiple track bridges, the abutment width shall be sufficient to provide for the standard shoulder, plus 15'-0" track centers for each existing or future track.

2. Provide a minimum of 6" from edge of masonry plate or bearing to edge of concrete.

3. Slope the top of bridge seat to drain.

4. Design shall provide accommodations for future maintenance. Abutment seat shall accommodate adequate jacking locations corresponding with the superstructure jacking stiffeners and shall not require the removal of bearings in order to jack. Jacking locations as well as jacking area shall be specifically denoted and laid out on the bridge plans.

5. Wing walls shall be designed to support 2 horizontal to 1 vertical embankment slope, a level approach to the bridge walkways, and provide positive ballast containment. MSE and sheet pile walls are not permissible.

6. Provide minimum clearance necessary between end of structural steel and face of backwalls to accommodate expansion, but not less than 4" at each end.

7. Provide water stops at all construction joints. Water stops shall be a hollow bulb PVC 9" X 3/8" (Bulb 3/4" inside diameter, 1-1/2" outside diameter) placed continuous across the joint.

8. Provide waterproofing on the backside of all abutments and wing walls. Waterproofing shall be as follows or approved equal: "MasterSeal 581" by BASF. Waterproofing system shall be UV stabilized.

9. 2'-0" of clean porous backfill, measured horizontally, shall be provided full height below sub ballast, behind all abutments and wing walls.

10. Provide adequate drainage behind abutments and wing walls utilizing filter fabric-wrapped perforated pipe drains at the base of the abutments and wingwalls. When abutment geometry does not allow for perforated pipe drains, weep holes with screens may be required. Drainage from the bridge shall drain away from the CSX right of way.

11. Non-perforated pipe shall be connected to the perforated pipe and drain away from the bridge with a 1% minimum slope.

12. Sloping embankments in front of abutments shall be comprised of large riprap (minimum 12" nominal sized stone) grouted with concrete on top of filter fabric. Sloping embankments shall be sloped no greater than 2 horizontal to 1 vertical.

C. Piers

1. Single column piers shall not be considered for undergrade structures. Piers shall be solid pier walls with a minimum thickness of 4'-0". Pier types shall be clearly identified in the TS&L (Type, Size, and Location) general plan sheet for CSX approval.

2. Width of pier cap shall be minimum 4'-0" measured at the bearing seat.

3. S lope the top of the bridge seat to drain.

4. Provide a minimum of 6" from edge of masonry plate or bearing to edge of concrete.

5. Provide a minimum of 1'-6" beyond the outside edge of outermost masonry plate or bearing to end of the pier.

6. Bridge piers adjacent to roadways shall be protected from vehicular traffic as required per AASHTO and governing standards or regulations.

D. Signage and Miscellaneous

1. CSX's standard "No Trespassing" and bridge number signs shall be furnished and installed as required by CSX sign standards 2703 and 2802, respectively, provided in Exhibit A.

2. Undergrade roadway clearance signs, advance warning signs, and other roadway signage shall be the responsibility of the roadway agency. Signs shall not be attached to the bridge.

3. The Applicant shall be responsible for graffiti removal from the structure, regardless of other provisions for division of maintenance responsibility.

VII. BRIDGE LAYOUT

A. The TS&L (Type, Size, and Location) as well as the general plan drawing of the bridge shall show the railroad valuation stations at the front face of backwalls, and centerline of piers or bents, along the centerline of the bridge. Distance from front face of low milepost backwall to low milepost nearest the bridge shall also be shown. The following criteria will serve as a guide for labeling the bridge layout.

1. CSX bridges are laid out in direction of increasing milepost, increasing from left to right on plans.

2. Plans shall denote the railroad direction and the nearest significant terminal or junction leading away from either end of the bridge.

3. Substructures are numbered starting with zero and increasing in the direction of increasing mileposts.

4. Superstructures are numbered starting with 1 and increasing in the direction of increasing mileposts.

5. Floor systems of through plate girder, through truss, and deck truss spans are numbered starting with 0 and increasing in the direction of increasing mileposts.

6. Bridge components are numbered from left to right facing the direction of increasing milepost.

B. Low mile post backwall GPS coordinates shall be detailed on plans, in degrees-minutes-seconds, or decimal format with precision to six (6) decimal places.

C. For bridges on curves, the girders, abutments, and piers shall be located with reference to chords.

D. Bridge shall be located to provide optimal railroad grade, profile, and alignment of structures and track.

VIII. PLAN PREPARATION AND SUBMITTALS

A. Preliminary Plans

1. An electronic copy of Type, Size and Location (TS&L) plans shall be submitted to CSX for review and acceptance. The TS&L plan shall show plan view, elevation and typical cross section of the proposed structure. CSX acceptance must be issued, in writing, before proceeding with design.

2. Furnish cross sections showing the CSX Clearance Envelope, topographic map with contours, and soil exploration data along with TS&L plans. CSX acceptance must be granted before proceeding with design.

B. CSX will assign a bridge designation when TS&L plans are reviewed and accepted. This bridge designation shall be shown on all drawings.

C. Construction Work Plans

1. CSX may require construction work plans to be submitted, particularly when work is being performed in the proximity of an active track, with potential to foul.

2. All construction work plans shall be submitted in accordance with Appendix: “Construction Submission Criteria”.

D. Material Submissions

1. Structural steel shop drawings shall be provided for CSX review and acceptance, prior to ordering material. Welding procedures shall be submitted with the structural steel shop drawings.

2. Concrete mix designs shall be submitted for CSX review and acceptance, prior to ordering material.

3. Third party testing reports shall be provided to CSX for review and acceptance in a timely manner.

4. All other materials shall be provided in accordance with the plans. All materials shall be reviewed and approved by the Agency or its representative. Proposed changes are subject to review and acceptance by CSX. Approved material submissions shall be furnished to CSX for confirmation and project documentation.

E. Final Plans

1. Provide electronic set of final signed and sealed design plans and calculations for CSX acceptance. Final plans shall include a stress sheet with bending, shear, and axial design load stresses and capacities for all main members as well as Cooper E load ratings for both Normal and Maximum conditions at 60 mph, 40 mph, 25 mph, and 10 mph.

SUPERSTRUCTURE RATING TABLE

SPAN	SHAPE	CONTROLLING MEMBER	A_w (in^2)	S_n (in^3)	F_y (ksi)	SPAN +/- (C-C)		DL	LL	I (60mph)	NORMAL RATING			MAXIMUM RATING		
											60mph	25mph	10mph	60mph	25mph	10mph
SPAN 3 (2 - DPG)	BUILT-UP 1913	DPG	35	3937	30	76'-11"	SHEAR (kips)	43	240	96	78	85	93	141	154	169
							MOMENT (k-ft.)	820	4042	1617	64	70	77	99	108	119
Span 4 (2 - DPG)	BUILT-UP 1924	DPG	48	7258	30	98'-11"	SHEAR (kips)	66	297	107	87	93	102	158	170	185
							MOMENT (k-ft.)	1624	6326	2266	77	83	91	120	129	140

2. Submit special provisions or special specifications for CSX acceptance.

3. Provide an electronic set of as-built plans to CSX upon completion of construction. All Changes shall be noted and clearly called out on a redlined set of as-built plans. All pages shall be clearly marked “AS-BUILT” and include the date of completion. AS-BUILT plans shall contain complete pile logs for all piles included in the final structure.

IX. CONSTRUCTION CONSIDERATIONS

A. After the construction contract is awarded, a copy of the contract shall be provided to CSX.

B. Maintenance of Railroad Traffic

1. It is essential that the construction be performed with minimum interference to rail traffic. Continuity of safe rail operations will be required for the duration of the project.

2. The Agency’s Design Engineer should contact the CSX Public Project Manager in the preliminary design stage to determine railroad operational requirements. The most effective method of maintaining traffic is to temporarily reroute traffic around the construction site using detour tracks. Detour tracks will be required where feasible. If detour tracks cannot be provided, the new superstructure shall be constructed adjacent to final location and lifted or rolled into place. Construction plans shall show complete details of temporary bridges and/or lift-in or roll-in structure.

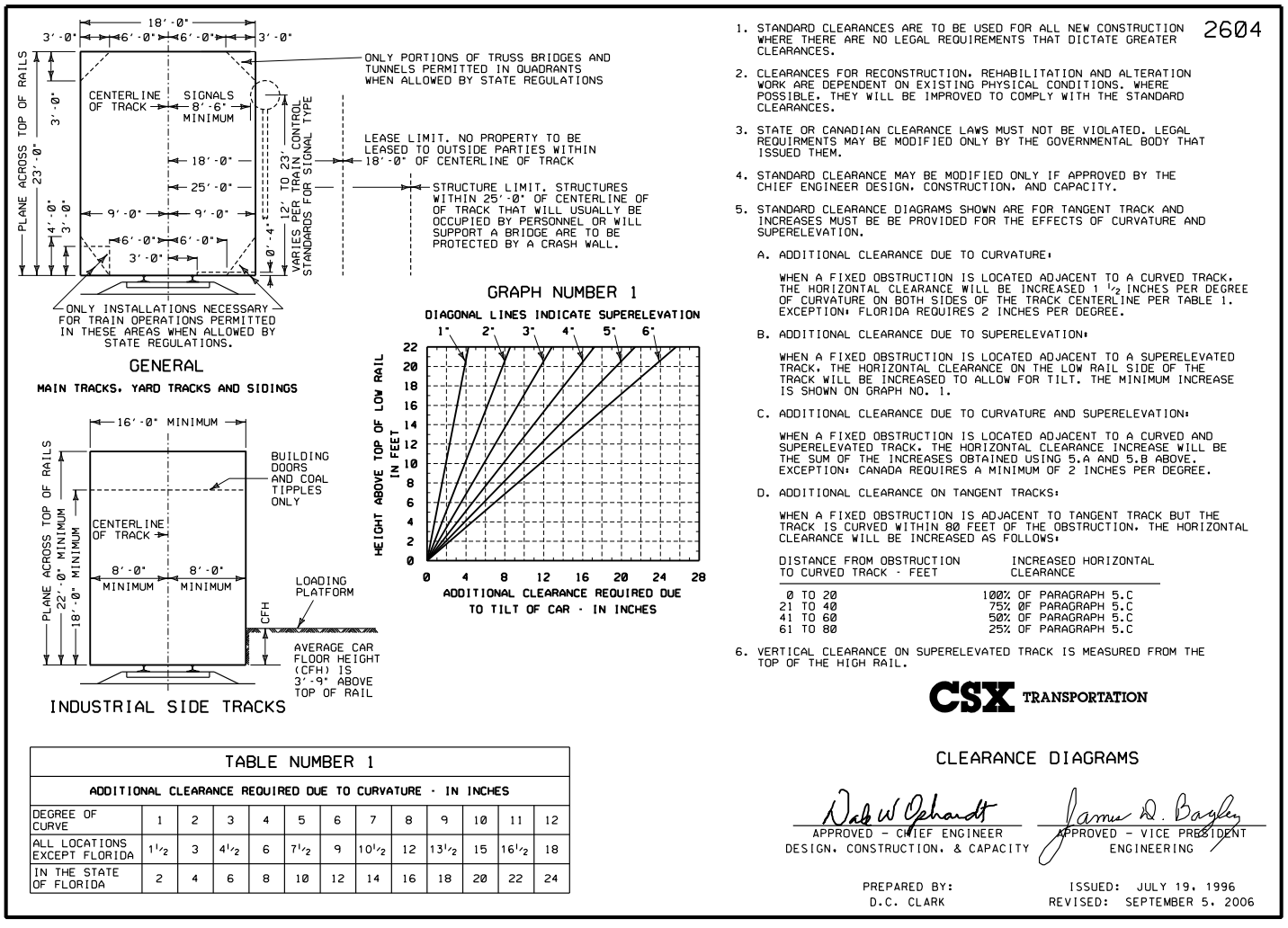
3. A detailed construction procedure for maintaining traffic shall be shown on the plans. When construction requires total interruption of rail traffic, an estimate of the time required will be shown in the procedure. This interval must be within the approved time frame furnished by the Public Project Manager.

4. Prior to the start of construction, written approval from CSX for the construction procedure must be secured.

EXHIBIT A

Typical Sections and Details:

- CSX Standard 2604 – Clearance Diagrams
- CSX Standard 2703 – No Trespassing Sign
- CSX Standard 2710 – Milepost and Numeral Signs
- Typical Track Geometry and Clearances
- Steel Superstructure with Steel Deck
- Steel Superstructure with Concrete Deck
- Through Plate Girder
- Inspection Walkway System
- Steel Deck Drain Detail



1. STANDARD CLEARANCES ARE TO BE USED FOR ALL NEW CONSTRUCTION WHERE THERE ARE NO LEGAL REQUIREMENTS THAT DICTATE GREATER CLEARANCES.
2. CLEARANCES FOR RECONSTRUCTION, REHABILITATION AND ALTERATION WORK ARE DEPENDENT ON EXISTING PHYSICAL CONDITIONS. WHERE POSSIBLE, THEY WILL BE IMPROVED TO COMPLY WITH THE STANDARD CLEARANCES.
3. STATE OR CANADIAN CLEARANCE LAWS MUST NOT BE VIOLATED. LEGAL REQUIRMENTS MAY BE MODIFIED ONLY BY THE GOVERNMENTAL BODY THAT ISSUED THEM.
4. STANDARD CLEARANCE MAY BE MODIFIED ONLY IF APPROVED BY THE CHIEF ENGINEER DESIGN, CONSTRUCTION, AND CAPACITY.
5. STANDARD CLEARANCE DIAGRAMS SHOWN ARE FOR TANGENT TRACK AND INCREASES MUST BE BE PROVIDED FOR THE EFFECTS OF CURVATURE AND SUPERELEVATION.
   - A. ADDITIONAL CLEARANCE DUE TO CURVATURE:

     WHEN A FIXED OBSTRUCTION IS LOCATED ADJACENT TO A CURVED TRACK, THE HORIZONTAL CLEARANCE WILL BE INCREASED 1 1/2 INCHES PER DEGREE OF CURVATURE ON BOTH SIDES OF THE TRACK CENTERLINE PER TABLE 1. EXCEPTION: FLORIDA REQUIRES 2 INCHES PER DEGREE.
   - B. ADDITIONAL CLEARANCE DUE TO SUPERELEVATION:

     WHEN A FIXED OBSTRUCTION IS LOCATED ADJACENT TO A SUPERELEVATED TRACK, THE HORIZONTAL CLEARANCE ON THE LOW RAIL SIDE OF THE TRACK WILL BE INCREASED TO ALLOW FOR TILT. THE MINIMUM INCREASE IS SHOWN ON GRAPH NO. 1.
   - C. ADDITIONAL CLEARANCE DUE TO CURVATURE AND SUPERELEVATION:

     WHEN A FIXED OBSTRUCTION IS LOCATED ADJACENT TO A CURVED AND SUPERELEVATED TRACK, THE HORIZONTAL CLEARANCE INCREASE WILL BE THE SUM OF THE INCREASES OBTAINED USING 5.A AND 5.B ABOVE. EXCEPTION: CANADA REQUIRES A MINIMUM OF 2 INCHES PER DEGREE.
   - D. ADDITIONAL CLEARANCE ON TANGENT TRACKS:

     WHEN A FIXED OBSTRUCTION IS ADJACENT TO TANGENT TRACK BUT THE TRACK IS CURVED WITHIN 80 FEET OF THE OBSTRUCTION, THE HORIZONTAL CLEARANCE WILL BE INCREASED AS FOLLOWS:

DISTANCE FROM OBSTRUCTION TO CURVED TRACK - FEET	INCREASED HORIZONTAL CLEARANCE
0 TO 20	100% OF PARAGRAPH 5.C
21 TO 40	75% OF PARAGRAPH 5.C
41 TO 60	50% OF PARAGRAPH 5.C
61 TO 80	25% OF PARAGRAPH 5.C

6. VERTICAL CLEARANCE ON SUPERELEVATED TRACK IS MEASURED FROM THE TOP OF THE HIGH RAIL.

CSX TRANSPORTATION

CLEARANCE DIAGRAMS

TABLE NUMBER 1												
ADDITIONAL CLEARANCE REQUIRED DUE TO CURVATURE - IN INCHES												
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	12
ALL LOCATIONS EXCEPT FLORIDA	1 1/2	3	4 1/2	6	7 1/2	9	10 1/2	12	13 1/2	15	16 1/2	18
IN THE STATE OF FLORIDA	2	4	6	8	10	12	14	16	18	20	22	24

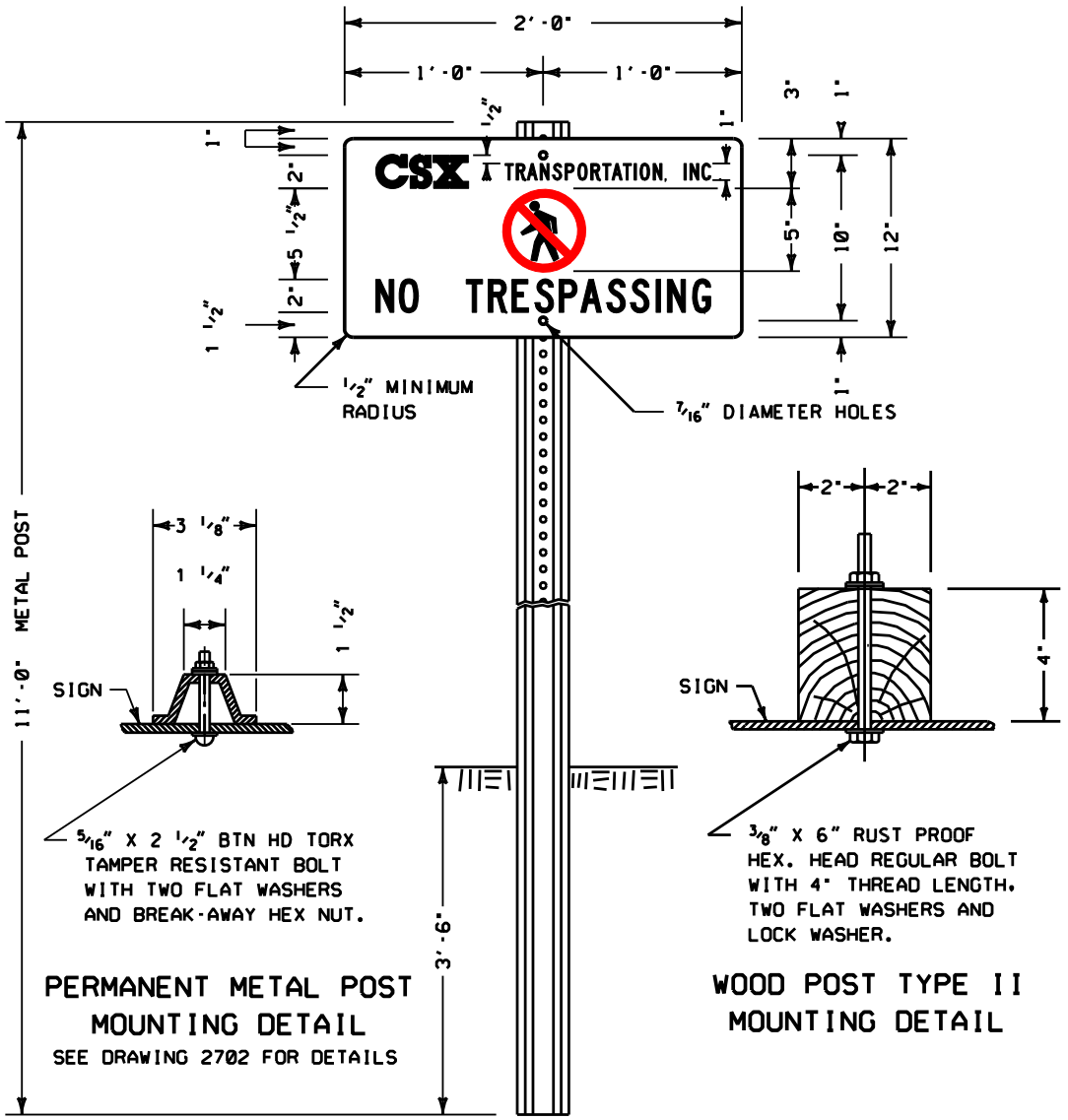
Dale W Gehandt
APPROVED - CHIEF ENGINEER DESIGN, CONSTRUCTION, & CAPACITY

James D. Bayley
APPROVED - VICE PRESIDENT ENGINEERING

PREPARED BY: D.C. CLARK

ISSUED: JULY 19, 1996
REVISED: SEPTEMBER 5, 2006

2703



DESCRIPTION	UNITS	CLASS	ITEM
SIGN, NO TRESPASSING, ALUMINUM	EACH	014	8005800
SIGN, NO TRESPASSING, COMPOSITE	EACH	014	8005805
2 1/2" FASTENERS - TORX TAMPER RESISTANT	EACH	110	0007301
BIT INSERT FOR TORX TAMPER RESISTANT BOLT	EACH	451	0023038
SIGN POST, METAL PERMANENT	EACH	014	8004600
SIGN POST, WOOD TYPE II	EACH	049	3040611

SIGN BLADE: 0.080" ALUMINUM ALLOY 5052-H38 / 6061-T6 OR ALUMINUM/PLASTIC COMPOSITE MATERIAL 4MM THICK WITH ROUNDED CORNERS. HOLES TO BE 7/16" DIAMETER. BLADE TO BE DEGREASED AND ETCHED.

FACING: WHITE HIGH INTENSITY PRISMATIC REFLECTIVE SHEETING •3930 MANUFACTURED BY 3M CORPORATION OR EQUIVALENT. APPLIED PER MANUFACTURER'S INSTRUCTIONS. THE SHEETING SHALL COMPLY ASTM D4956.

TEXT: BLACK SILKSCREEN. SCOTCHCAL OR EQUAL. CORPORATE SYMBOL TO BE CURRENT DESIGN. OTHER LETTERS SHALL CONFORM TO THE FEDERAL HIGHWAY ADMINISTRATION STANDARD ALPHABET. SERIES C. PEDESTRIAN PROHIBITED SYMBOL. 5" DIAMETER FEDERAL HIGHWAY ADMINISTRATION SIGN R9-3A. FIGURE - BLACK. CIRCLE AND DIAGONAL STRIPE - RED.

LOCATION: THE PLACEMENT OF SIGNS MUST BE IN COMPLIANCE WITH ANY STATE OR LOCAL LAWS THAT APPLY TO THEIR USE.

SET POST A MINIMUM OF 12'-0" (13'-0" IN PENNSYLVANIA) FROM CENTERLINE OF TRACK AND 5' TO 15' AHEAD OF THE BRIDGE BACKWALL.

USE AT ALL STRUCTURES OVER PUBLIC ROADWAYS, BRIDGES, AND LOCATIONS SPECIFIED IN THE TIMETABLE.

WHEN USED AT BRIDGES, PLACE A SIGN ON BOTH THE RIGHT AND LEFT SIDE OF THE TRACK AT EACH END OF THE STRUCTURE.

ORIENT SIGN SO THAT LETTERS ARE FACING AWAY FROM THE STRUCTURE.

WHEN USED ON RAILROAD PROPERTY AWAY FROM TRACKS, PLACE THE SIGN AT EDGE OF PROPERTY WITH THE LETTERS FACING AWAY FROM THE PROPERTY.

CSX TRANSPORTATION

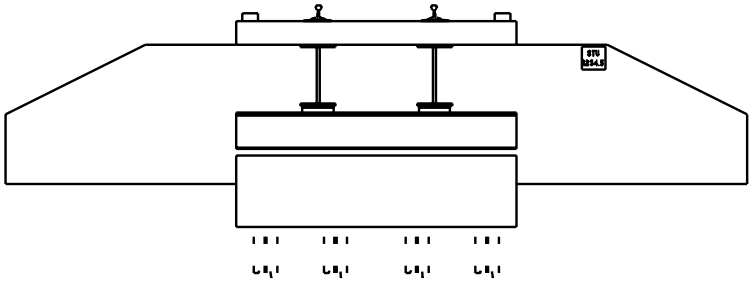
NO TRESPASSING SIGN

APPROVED - DIRECTOR ENGINEERING STANDARDS

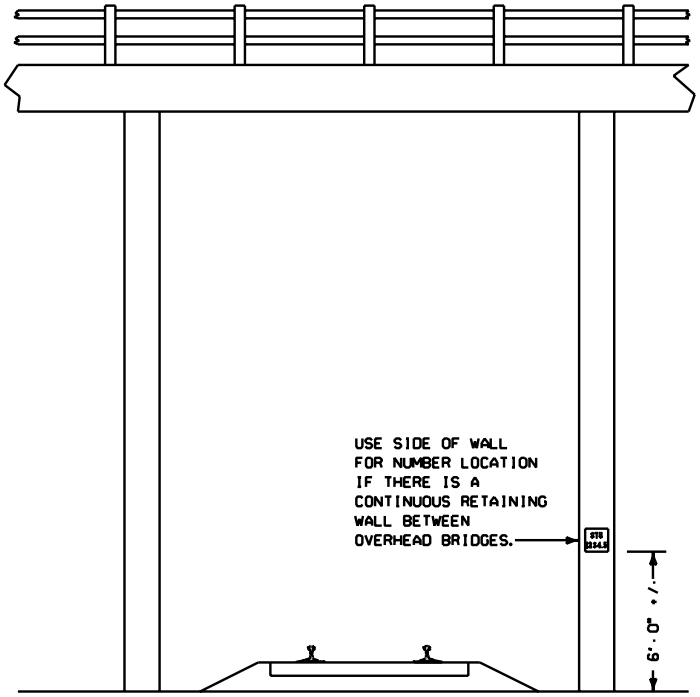
APPROVED - AVP ENGINEERING

PREPARED BY: J. E. BEYERL

ISSUED: APRIL 14, 2003
REVISED: OCTOBER 28, 2011



BRIDGE SIGN LOCATION - BACKWALL



BRIDGE SIGN LOCATION - OVERHEAD BRIDGES

2802

ALL BRIDGES AND TRESTLES ARE TO BE NUMBERED WITH THE MILEPOST PREFIX OF THE SUBDIVISION ON WHICH THE STRUCTURE IS LOCATED AND THE MILEPOST LOCATION TO THE NEAREST ONE-TENTH OF A MILE.

THE BRIDGE NUMBER IS TO BE PAINTED ON EACH BACKWALL ON THE RIGHT HAND SIDE OF THE STRUCTURE FOR A TRAIN APPROACHING THE STRUCTURE.

OVERHEAD STRUCTURES WILL HAVE THE BRIDGE NUMBER PAINTED ON THE PIER NEXT TO THE MAIN TRACK ON THE RIGHT HAND SIDE FOR A TRAIN APPROACHING THE STRUCTURE. IF THERE IS A CONTINUOUS RETAINING WALL BETWEEN ADJACENT OVERHEAD BRIDGES, THE BRIDGE NUMBER WILL BE PAINTED ON THE RETAINING WALL WHERE THE EDGE OF THE OVERHEAD BRIDGE CROSSES OVER THE TRACK.

THE BRIDGE NUMBER LOCATION ON THE STRUCTURE IS TO BE DETERMINED BY THE DESIGN OF THE STRUCTURE.

ON BACKWALLS, IF PRACTICABLE, THE LOCATION SELECTED SHOULD BE CLEARLY VISABLE FROM TRAINS AND INSPECTION VEHICLES USING THE STRUCTURE.

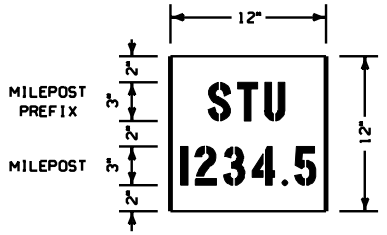
ON PIERS AND RETAINING WALLS, THE LOWER EDGE OF THE SIGN SHOULD BE ABOUT SIX FEET ABOVE GROUND LEVEL.

BRIDGE NUMBERS ARE TO BE 3" HIGH.

BRIDGE NUMBERS ARE TO BE PAINTED WITH BLACK LETTERS ON A WHITE BACKGROUND OR WHITE LETTERS ON A BLACK BACKGROUND DEPENDING ON WHICH COMBINATION WILL PROVIDE THE BEST LEGIBILITY WHEN APPLIED TO THE BRIDGE.

BRIDGE NUMBERS ARE TO CONFORM TO THE C. H. HANSEN GOTHIC STENCILS, OR EQUIVALENT. THE STENCILS MAY BE ORDERED USING

LETTERS, ITEM NUMBER 451 0033263, HANSEN SET NUMBER 10033
NUMBERS, ITEM NUMBER 451 0033303, HANSEN SET NUMBER 10013



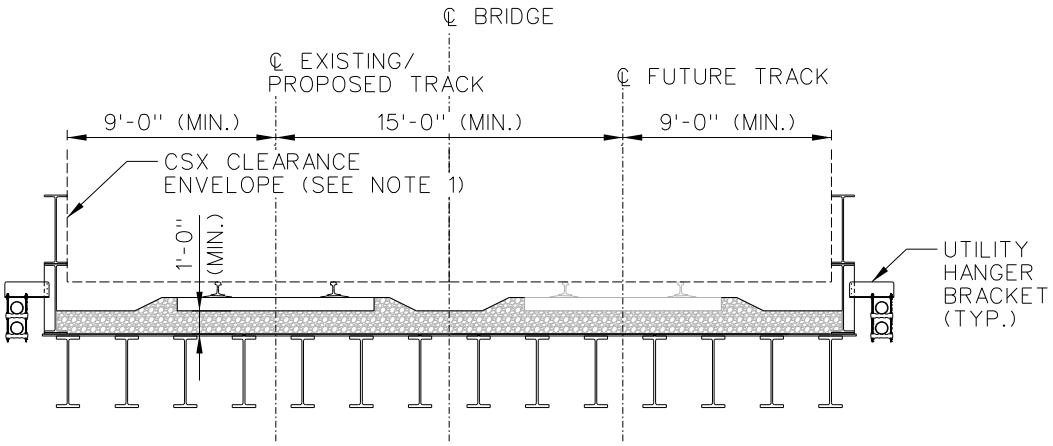
BLACK LETTERS ON WHITE BACKGROUND.

TYPICAL BRIDGE SIGN

CSX TRANSPORTATION

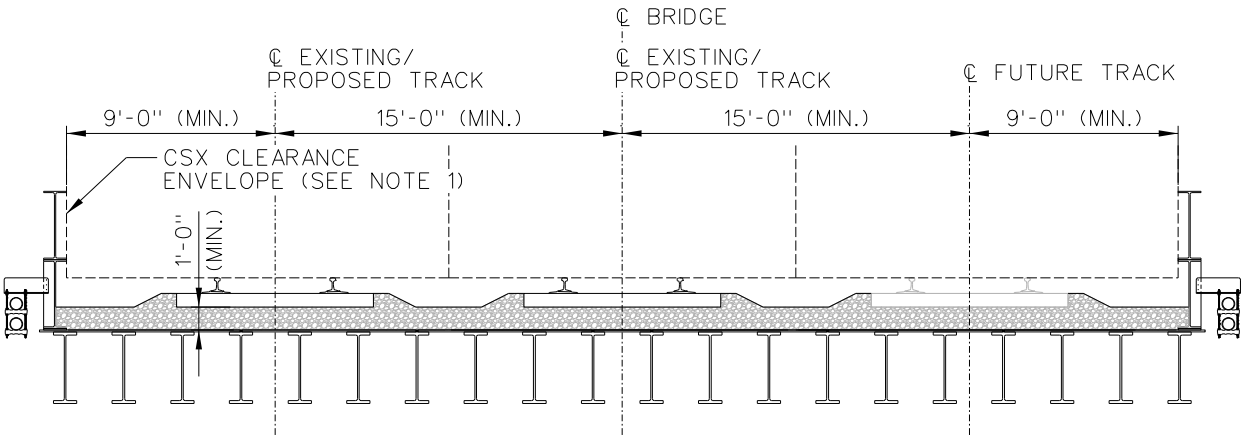
BRIDGE NUMBER SIGNS

SIGNED	SIGNED
REVIEWED - ENGINEER STANDARDS AND TESTING	APPROVED - ASSISTANT VICE PRESIDENT, EQUIPMENT AND TRACK SYSTEMS ENGINEERING
ISSUED, OCTOBER 30, 1998	REVISED, INITIAL ISSUE



UNDERGRADE BRIDGE - TYPICAL ONE TRACK SECTION

(DIAPHRAGMS/CROSS FRAMES NOT SHOWN FOR CLARITY)



UNDERGRADE BRIDGE - TYPICAL TWO TRACK SECTION

NOTES:

1. TANGENT TRACK SHOWN. INCREASES IN CLEARANCES MUST BE PROVIDED TO ACCOUNT FOR EFFECTS FROM CURVATURE AND SUPERELEVATION. REFER TO CSX STANDARD DRAWING 2604.

CSX

PUBLIC PROJECTS - UNDERGRADE BRIDGE DETAILS
TYPICAL TRACK GEOMETRY AND CLEARANCES
TYPICAL SECTION

FOR REFERENCE ONLY

PUBLIC PROJECTS

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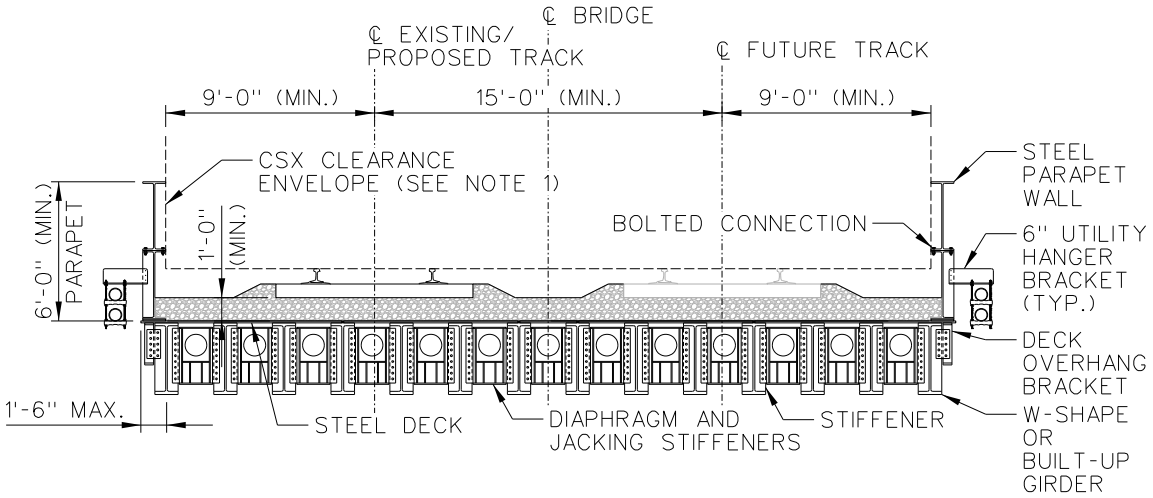
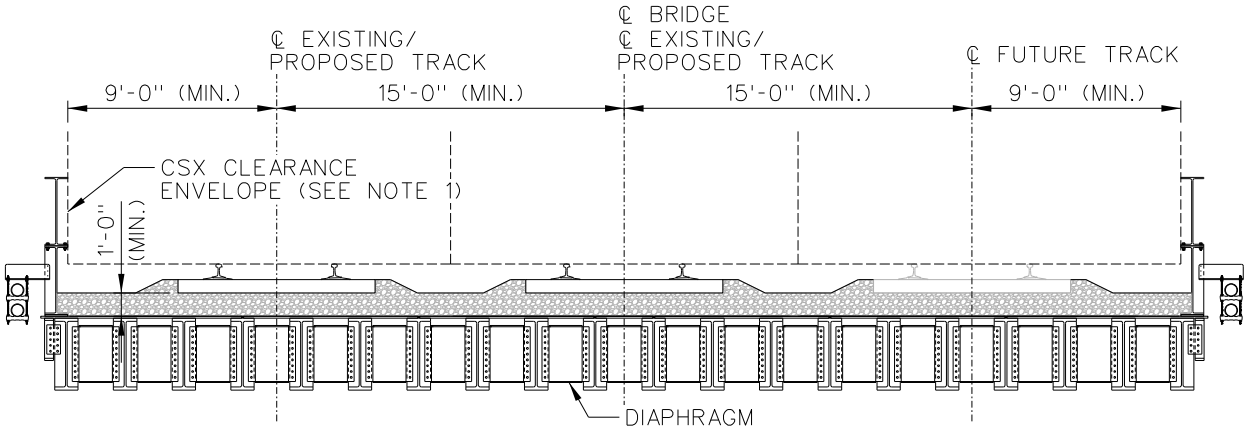


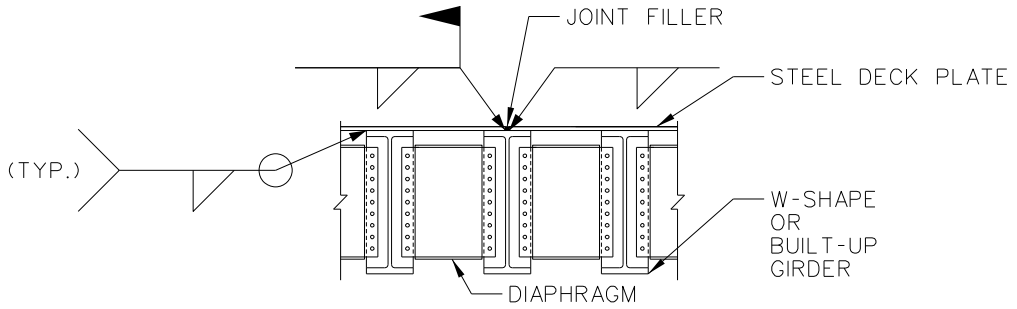
TYPICAL SECTION - ONE TRACK AT END DIAPHRAGM

(BEARING AND SUBSTRUCTURE NOT SHOWN FOR CLARITY)



TYPICAL SECTION - TWO TRACKS AT INTERMEDIATE DIAPHRAGM

(NOTES SIMILAR TO FIGURE ABOVE UNLESS NOTED OTHERWISE)



TYPICAL DECK WELD DETAIL

NOTES:

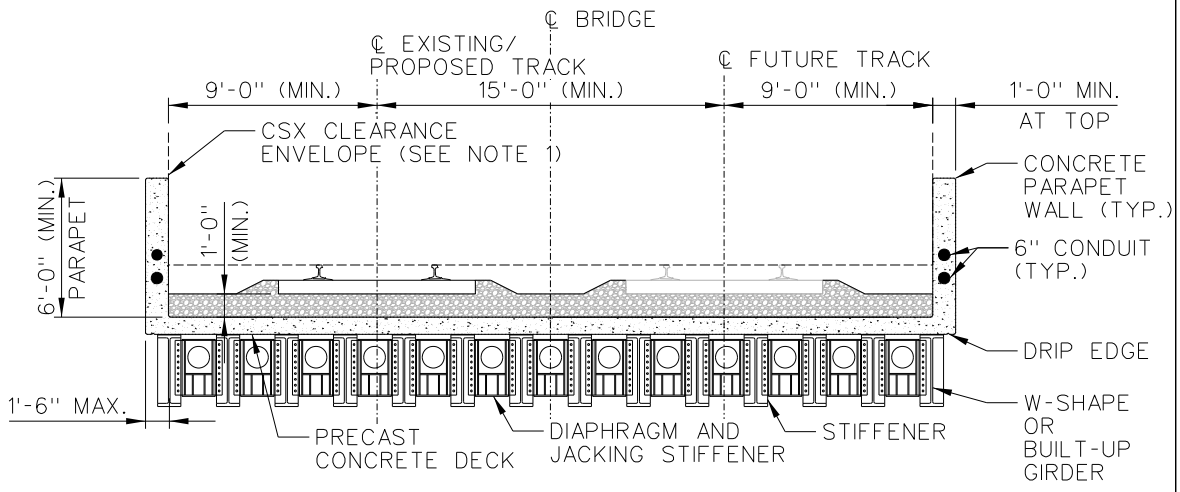
1. TANGENT TRACK SHOWN. INCREASES IN CLEARANCES MUST BE PROVIDED TO ACCOUNT FOR EFFECTS FROM CURVATURE AND SUPERELEVATION. REFER TO CSX STANDARD DRAWING 2604.

CSX

PUBLIC PROJECTS - UNDERGRADE BRIDGE DETAILS
STEEL SUPERSTRUCTURE WITH STEEL DECK
TYPICAL SECTION

FOR REFERENCE ONLY

PUBLIC PROJECTS



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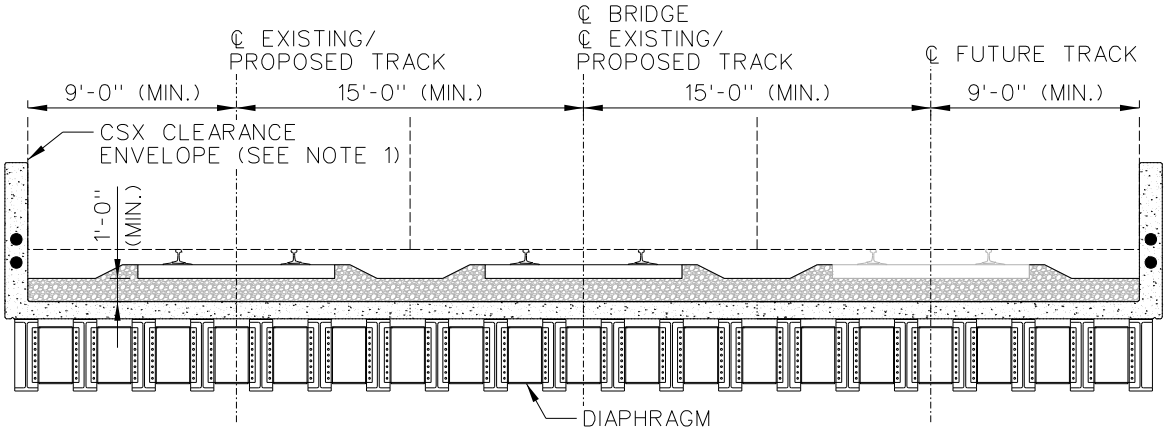
(BEARING AND SUBSTRUCTURE NOT SHOWN FOR CLARITY)



TYPICAL SECTION - TWO TRACKS AT INTERMEDIATE DIAPHRAGM

(NOTES SIMILAR TO FIGURE ABOVE UNLESS NOTED OTHERWISE)

NOTES:

1. TANGENT TRACK SHOWN. INCREASES IN CLEARANCES MUST BE PROVIDED TO ACCOUNT FOR EFFECTS FROM CURVATURE AND SUPERELEVATION. REFER TO CSX STANDARD DRAWING 2604.

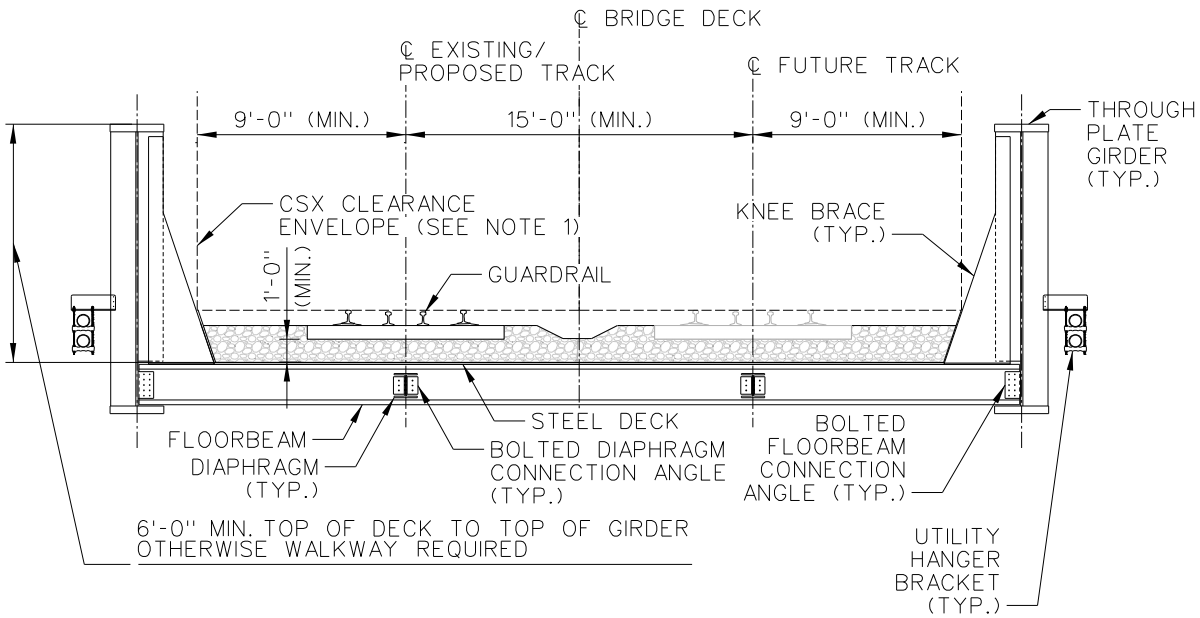
CSX

PUBLIC PROJECTS - UNDERGRADE BRIDGE DETAILS
STEEL SUPERSTRUCTURE WITH CONCRETE DECK
TYPICAL SECTION

133

FOR REFERENCE ONLY

PUBLIC PROJECTS



TYPICAL SECTION - ONE TRACK

NOTES:

1. TANGENT TRACK SHOWN. INCREASES IN CLEARANCES MUST BE PROVIDED TO ACCOUNT FOR EFFECTS FROM CURVATURE AND SUPERELEVATION. REFER TO CSX STANDARD DRAWING 2604.

CSX

PUBLIC PROJECTS - UNDERGRADE BRIDGE DETAILS
THROUGH PLATE GIRDER
TYPICAL SECTION

FOR REFERENCE ONLY

PUBLIC PROJECTS

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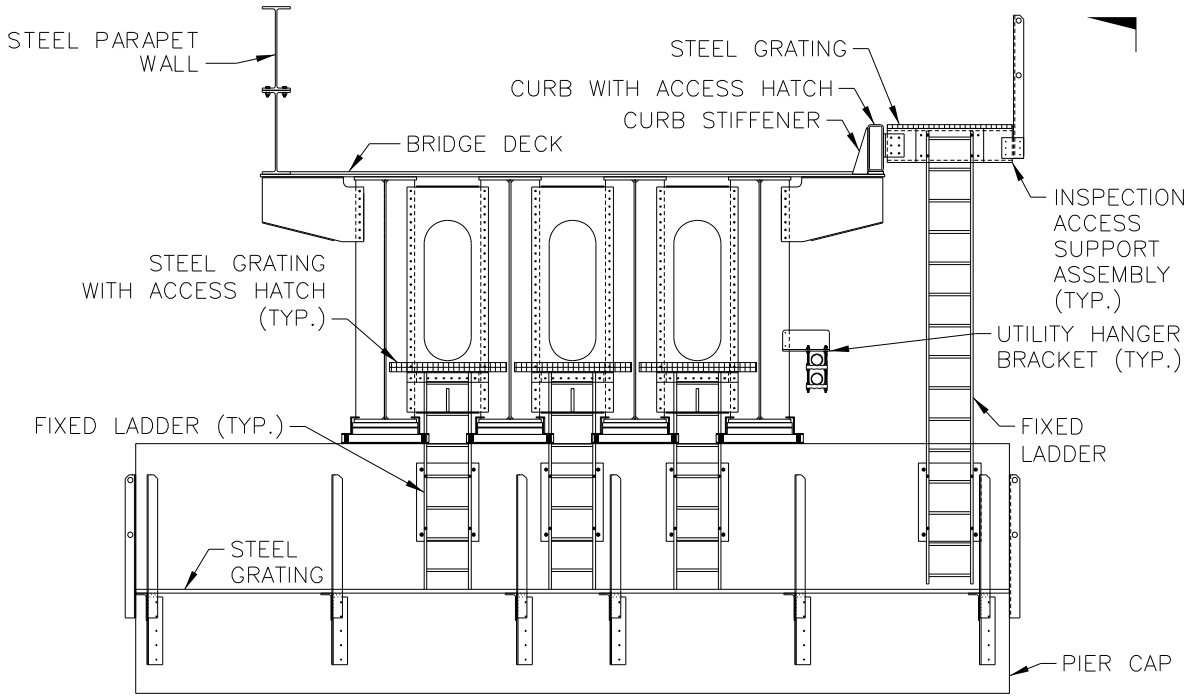
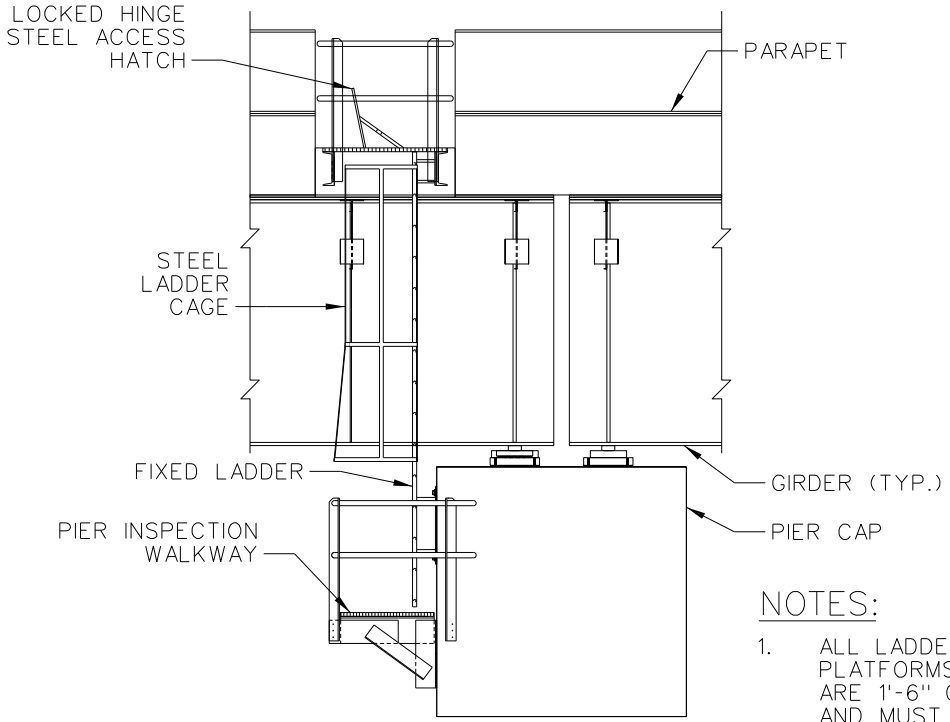


SECTION
SCALE: N.T.S.
(SUBSTRUCTURE, HANDRAIL, AND STEEL LADDER CAGE NOT SHOWN FOR CLARITY)

A



VIEW
N.T.S.

A

NOTES:

1. ALL LADDERS, INSPECTION PLATFORMS, AND HATCHES ARE 1'-6" OUT TO OUT AND MUST COMPLY WITH OSHA AND AREMA SAFETY REQUIREMENTS.

CSX

PUBLIC PROJECTS - UNDERGRADE BRIDGE DETAILS
INSPECTION WALKWAY SYSTEM

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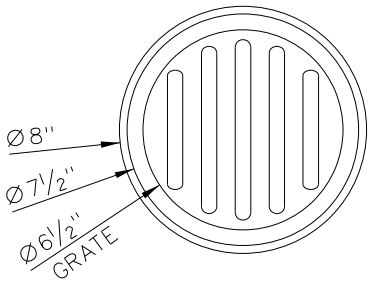
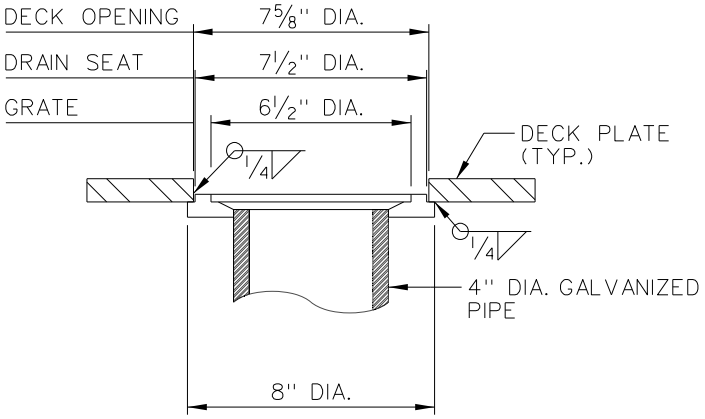
FOR REFERENCE ONLY

PUBLIC PROJECTS





STEEL DECK DRAIN

CSX

PUBLIC PROJECTS - UNDERGRADE BRIDGE DETAILS
STEEL DECK DRAIN DETAIL

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FOR REFERENCE ONLY

PUBLIC PROJECTS

APPENDIX

CSX TRANSPORTATION

TRAIL CONSTRUCTION AROUND CSX BRIDGES

(Non-Vehicular crossing over or under the railroad)

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

All trails impacting the railroad shall be designed in accordance with these Guidelines, the Manual of Uniform Traffic Control Devices (MUTCD), AASHTO code and any applicable sections of the AREMA MRE.

A. At Grade Crossing

1. CSX does not allow at grade trail crossings. Alternative plans should be considered to avoid crossing railroad tracks at grade.

2. At grade crossings immediately adjacent to an existing public roadway crossing with existing highway railroad warning devices may be considered. However, all costs associated with the installation of the new crossing surface and crossing warning device changes or relocation will be borne by the Applicant.

3. Scope of proposed crossing work will be determined at a joint diagnostic meeting between CSX and the Applicant.

4. The trail must conform to CSX and MUTCD requirements.

B. Trail Parallel to Track

1. CSX does not allow trails parallel to the track on CSX right-of-way and does not permit the use of CSX Access Roads for trail use.

2. CSX structures shall not be used to serve trail traffic or support a structure serving trail traffic.

3. Fences or barriers such as vegetation, ditches, and/or berms shall separate trails that are outside CSX right-of-way and running parallel to the track to stop trespassers from entering CSX right-of-way.

C. Undergrade Crossing (Railroad structure over trail)

CSX discourages the construction of new undergrade structures. Consider the use of existing structures to cross CSX tracks. If an undergrade structure is the only feasible structure type for the proposed site, a detailed type selection report must be submitted to justify its use. In accordance with Homeland Security requirements, some railroad sites and structures are off limits for trail use and crossing.

Undergrade trail crossings which also serve to convey water are not permitted.

1. Existing Undergrade Structures

i. CSX may reject, at its discretion, the use of any existing undergrade structure for trail use.

ii. Existing culvert pipe, box or arch structures, designed to convey water, are not permitted for trail crossing use.

iii. An open deck structure shall be modified to a ballast deck or solid deck structure to maintain a safe crossing under a railroad structure. If modifying an existing open deck structure is not practical, provide a protective cover over the trail as described.

2. New Undergrade Crossing

i. New undergrade structures shall be designed per the undergrade railroad bridge criteria presented in these guidelines.

ii. All pipe and concrete box culverts shall be designed per CSX requirements and any applicable sections of the AREMA MRE.

iii. Confined structures are discouraged. To improve safety and sight distance, all structures shall be tangent without curvature.

iv. The clear width and height of pedestrian structures shall be subject to the project site and structure length. The line of sight, historical security data, and lighting shall be used for determining the required size of opening.

v. Vertical Clearance shall not be less than 8'-0".

3. Canopy

A canopy will be installed under the existing or new undergrade CSX structure as follows:

i. The minimum clearance between the top of the canopy and the underside of the bridge shall be 5 feet.

ii. The trail in the vicinity of the undergrade bridge must be able to be closed and the canopy removed as necessary at the trail owner's expense, to allow CSX access to inspect and maintain the bridge. The trail must remain closed until the CSX work is completed and the canopy and fencing is restored. CSX will not be responsible for any damage to the portions of the canopy that occur due to CSX inspection, maintenance, operations or other work.

iii. The canopy shall be adequately designed to sustain the impact of debris falling from the CSX bridge. Debris with potential to fall includes but is not limited to tie plates which are approximately 1'-6" x 8" x 1 1/2" and weigh approximately 36.5 pounds.

iv. The canopy shall extend at least 15'-0" beyond the bridge fascia on either side of the bridge.

4. Drainage

The drainage pattern of the site before and after construction shall be analyzed. Adequate drainage provisions shall be incorporated into the plans and specifications. A detailed hydraulic report may be required subject to site condition. The hydraulic report must meet the CSX Hydraulic Criteria. The cost of the hydraulic report and any required associated reports shall be the responsibility of the applicant.

5. Fence

i. Provide fencing along the trail to prevent trespassing near the CSX track area and facilities. The Applicant shall specify the appropriate fencing to contain the trail traffic within the trail, crossing CSX right-of-way. Fence limits are subject to each project site and must be determined on a case by case basis.

ii. Fencing shall be located where it will not impede CSX's access to the bridge for inspection and shall be removed and replaced at the Applicant's expense when necessary for access by CSX.

iii. All CSX right-of-way fencing, for trails adjacent to the CSX right-of-way, must be provided, installed outside CSX right-of-way and maintained by the Applicant.

iv. Gates must be provided to readily permit CSX access to the undergrade bridge areas from below the bridge. CSX to provide a lock.

6. Signs

i. All access to trails crossing CSX railroad track shall be protected with bollard posts and signs prohibiting non-authorized vehicular access.

ii. All advisory and regulatory signs shall be in compliance with MUTCD and AASHTO. “No Trespassing” signs shall be posted every 500’-0”.

7. Plan Requirements

i. Plans shall show all clearances between the proposed trail and the bridge structure.

ii. Provide the closure procedure for periods when the trail will require closure in the vicinity of the undergrade bridge due to CSX inspection, maintenance, or other operations.

iii. Clearly show and label the CSX right of way lines on the plans.

iv. Show canopy clearances on the plans.

v. Provide details for fence and signage details to prevent trespassers from accessing the CSX right of way.

8. Construction Submittals

i. During construction, CSX will review all submittals relating to the installation of the trail components in relation to the bridge structure.

APPENDIX

CSX TRANSPORTATION

CONSTRUCTION SUBMISSION CRITERIA

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

INTRODUCTION

SECTION I: Definitions

SECTION II: Construction Submissions

SECTION III: Hoisting Operations

SECTION IV: Demolition Procedure

SECTION V: Erection Procedure

SECTION VI: Temporary Excavation and Shoring

SECTION VII: Track Monitoring

INTRODUCTION

The intent of this document is to guide outside agencies and their Contractors when performing work on, over, or with potential to impact CSX property (ROW). Work plans shall be submitted for review to the designated CSX Engineering Representative for all work which presents the potential to affect CSX property or operations; this document shall serve as a guide in preparing these work plans. All work shall be performed in a manner that does not adversely impact CSX operations or safety; as such, the requirements of this document shall be strictly adhered to, in addition to all other applicable standards associated with the construction. Applicable standards include, but are not limited to, CSX Standards and Special Provisions, CSX Insurance Requirements, CSX Pipeline Occupancy Criteria, as well as the governing local, county, state and federal requirements. It shall be noted that this document and all other CSX standards are subject to change without notice, and future revisions will be made available at the CSX website: www.csx.com.

I. DEFINITIONS

1. Agency – The project sponsor (i.e., State DOT, Local Agencies, Private Developer, etc.)

2. AREMA – American Railway Engineering and Maintenance-of-Way Association – the North American railroad industry standards group. The use of this term shall be in specific reference to the AREMA Manual for Railway Engineering.

3. Construction Submission – The Agency or its representative shall submit six (6) sets of plans, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans, specifications, and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.

4. Controlled Demolition – Removal of an existing structure or subcomponents in a manner that positively prevents any debris or material from falling, impacting, or otherwise affecting CSX employees, equipment or property. Provisions shall be made to ensure that there is no impairment of railroad operations or CSX's ability to access its property at all times.

5. Contractor – The Agency's representative retained to perform the project work.

6. Engineer – CSX Engineering Representative or a GEC authorized to act on the behalf of CSX.

7. Flagman – A qualified CSX employee with the sole responsibility to direct or restrict movement of trains, at or through a specific location, to provide protection for workers.

8. GEC – General Engineering Consultant who has been authorized to act on the behalf of CSX.

9. Horizontal Clearance – Distance measured perpendicularly from centerline of any track to the nearest obstruction at any elevation between TOR and the maximum vertical clearance of the track.

10. Professional Engineer – An engineer who is licensed in State or Commonwealth in which the project is to occur. All plans, specifications, and supporting calculations shall be prepared by the Licensed Professional Engineer and shall bear his/her seal and signature.

11. Potential to Foul – Work having the possibility of impacting CSX property or operations; defined as one or more of the following:

    a. Any activity where access onto CSX property is required.

b. Any activity where work is being performed on CSX ROW.

c. Any excavation work adjacent to CSX tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the CSX property limits.

d. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Note that hoisting equipment with the potential to foul must satisfy the 150% factor of safety requirement for lifting capacities.

e. Any work where the scatter of debris, or other materials has the potential to encroach within twenty five feet (25'-0") of the nearest track centerline.

f. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.

g. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by CSX.

12. ROW – Right of Way; Refers to CSX Right-of-Way as well as all CSX property and facilities. This includes all aerial space within the property limits, and any underground facilities.

13. Submission Review Period - a minimum of thirty (30) days in advance of start of work. Up to thirty (30) days will be required for the initial review response. Up to an additional thirty (30) days may be required to review any/all subsequent submissions or resubmission.

14. Theoretical Railroad Live Load Influence Zone – A 1 horizontal to 1 vertical theoretical slope line starting at bottom corner of tie.

15. TOR – Top of Rail. This is the base point for clearance measurements. It refers to the crown (top) of the steel rail; the point where train wheels bear on the steel rails.

16. Track Structure – All load bearing elements which support the train. This includes, but is not limited to, the rail, ties, appurtenances, ballast, sub-ballast, embankment, retaining walls, and bridge structures.

17. Vertical Clearance – Distance measured from TOR to the lowest obstruction within six feet (6'-0") of the track centerline, in either direction.

II. GENERAL SUBMISSION REQUIREMENTS

A. A construction work plan is required to be submitted by the Agency or its Contractor, for review and acceptance, prior to accessing or performing any work with Potential to Foul.

B. The Agency or its representative shall submit six (6) sets of plans, specifications, supporting calculations, and detailed means and methods procedures for the specific proposed work activity.

C. Construction submissions shall include all information relevant to the work activity, and shall clearly and concisely explain the nature of the work, how it is being performed, and what measures are being taken to ensure that railroad property and operations are continuously maintained.

D. All construction plans shall include a map of the work site, depicting the CSX tracks, the CSX right of way, proposed means of access, proposed locations for equipment and material staging (dimensioned from nearest track centerline), as well as all other relevant project information. An elevation drawing may also be necessary in order to depict clearances or other components of the work.

E. Please note that CSX will not provide pricing to individual contractors involved in bidding projects. Bidding contractors shall request information from the agency and not CSX.

F. The Contractor shall install a geotextile fabric ballast protection system to prevent construction or demolition debris and fines from fouling ballast. The geotextile ballast protection system shall be installed and maintained by the Contractor to the satisfaction of the Engineer.

G. The Engineer shall be kept aware of the construction schedule. The Contractor shall provide timely communication to the Engineer when scheduling the work such that the Engineer may be present during the work. The Contractor's schedule shall not dictate the work plan review schedule, and flagging shall not be scheduled prior to receipt of an accepted work plan.

H. At any time during construction activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSX facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSX and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

I. Blasting will not be permitted to demolish a structure over or within CSX's right-of-way. When blasting off of CSX property but with Potential to Foul, vibration monitoring, track settlement surveying, and/or other protective measures may be required as determined by the Engineer.

J. Blasting is not permitted adjacent to CSX right-of-way without written approval from the Chief Engineer, CSX.

K. Mechanical and chemical means of rock removal must be explored before blasting is considered. If written permission for the use of explosives is granted, the Agency or Contractor must submit a work plan satisfying the following requirements:

1. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Agency or Contractor.

2. Electronic detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.

3. No blasting shall be done without the presence of an authorized representative of CSX. Advance notice to the Engineer is required to arrange for the presence of an authorized CSX representative and any flagging that CSX may require.

4. Agency or Contractor must have at the project site adequate equipment, labor and materials, and allow sufficient time, to clean up debris resulting from the blasting and correct any misalignment of tracks or other damage to CSX property resulting from the blasting. Any corrective measures required must be performed as directed by the Engineer at the Agency's or Contractor's expense without any delay to trains. If Agency's or Contractor's actions result in the delay of any trains including passenger trains, the Agency or Contractor shall bear the entire cost thereof.

5. The Agency or Contractor may not store explosives on CSX property.

6. At any time during blasting activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSX facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSX and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

III. HOISTING OPERATIONS

A. All proposed hoisting operations with Potential to Foul shall be submitted in accordance with the following:

1. A plan view drawing shall depict the work site, the CSX track(s), the proposed location(s) of the lifting equipment, as well as the proposed locations for picking, any intermediate staging, and setting the load(s). All locations shall be dimensioned from centerline of the nearest track. Crane locations shall also be dimensioned from a stationary point at the work site for field confirmation.

2. Computations showing the anticipated weight of all picks. Computations shall be made based upon the field-verified plans of the existing structure. Pick weights shall account for the weight of concrete rubble or other materials attached to the component being removed; this includes the weight of subsequent rigging devices/components. Rigging components shall be sized for the subsequent pick weight.

3. All lifting equipment, rigging devices, and other load bearing elements shall have a rated (safe lifting) capacity that is greater than or equal to 150% of the load it is carrying, as a factor of safety. Supporting calculations shall be furnished to verify the minimum capacity requirement is maintained for the duration of the hoisting operation.

4. Dynamic hoisting operations are prohibited when carrying a load with the Potential to Foul. Cranes or other lifting equipment shall remain stationary during lifting. (i.e., no moving picks).

5. For lifting equipment, the manufacturer's capacity charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted.

6. A schematic rigging diagram must be provided to clearly call out each rigging component from crane hook to the material being hoisted. Copies of catalog or information sheets shall be provided to verify rigging weights and capacities.

7. For built-up rigging devices, the contractor shall submit the following:

i. Details of the device, calling out material types, sizes, connections and other properties.

ii. Load test certification documents and/or design computations bearing the seal and signature of a Professional Engineer. Load test shall be performed in the configuration of its intended use as part of the subject demolition procedure.

iii. Copies of the latest inspection reports of the rigging device. The device shall be inspected within one (1) calendar year of the proposed date for use.

8. A detail shall be provided showing the crane outrigger setup, including dimensions from adjacent slopes or facilities. The detail shall indicate requirements for bearing surface preparation, including material requirements and compaction efforts. As a minimum, outriggers and/or tracks shall bear on mats, positioned on level material with adequate bearing capacity.

9. A complete written narrative that describes the sequence of events, indicating the order of lifts and any repositioning or re-hitching of the crane(s).

IV. DEMOLITION PROCEDURE

A. The Agency or its Contractor shall submit a detailed procedure for a controlled demolition of any structure on, over, or adjacent to the ROW. The controlled demolition procedure must be approved by the Engineer prior to beginning work on the project.

B. Existing Condition of structure being demolished:

1. The Contractor shall submit as-built plans for the structure(s) being demolished

.

2. If as-built plans are unavailable, the Contractor shall perform an investigation of the structure, including any foundations, substructures, etc. The field measurements are to be made under the supervision of the Professional Engineer submitting the demolition procedure. Findings shall be submitted as part of the demolition means and methods submittal for review by the Engineer.

3. Any proposed method for temporary stabilization of the structure during the demolition shall be based on the existing plans or investigative findings, and submitted as part of the demolition means and methods for review by the Engineer.

C. Demolition work plans shall include a schematic plan depicting the proposed locations of the following, at various stages of the demolition:

1. All cranes and equipment, calling out the operating radii.

2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track

.

3. Proposed locations for stockpiling material or locations for truck loading

.

4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.

5. Note that no crane or equipment may be set on the CSX rails or track structure and no material may be dropped on CSX property.

D. Demolition submittal shall also include the following information:

1. All hoisting details, as dictated by Section III of this document.

2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., torch/saw cutting various portions of the superstructure or substructure, dismantling splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSX operations may be assessed and eliminated or minimized.

3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.

4. Design and supporting calculations shall be prepared, signed, and sealed by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSX forces, at the expense of the Agency or its contractor.

E. Girders or girder systems shall be stable at all times during demolition. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).

F. Existing, obsolete, bridge piers shall be removed to a minimum of three feet (3'-0") below the finished grade, final ditch line invert, or as directed by the Engineer.

G. A minimum quantity of twenty five (25) tons of CSX approved granite track ballast may be required to be furnished and stockpiled on site by the Contractor, or as directed by the Engineer.

H. The use of acetylene gas is prohibited for use on or over CSX property. Torch cutting shall be performed utilizing other materials such as propane.

I. CSX's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab.

J. Demolition Debris Shield

1. On-track or ground-level debris shields (such as crane mats) are prohibited for use by CSX.

2. Demolition Debris Shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the structure. The demolition debris shield shall be erected from the underside of the bridge over the track area to catch all falling debris. The debris shield shall not be the primary means of debris containment.

i. The demolition debris shield design and supporting calculations, all signed/sealed by a Professional Engineer, shall be submitted for review and acceptance.

ii. The demolition debris shield shall have a minimum design load of 50 pounds per square foot (50 psf) plus the weight of the equipment, debris, personnel, and all other loads.

iii. The Contractor shall verify the maximum particle size and quantity of the demolition debris generated during the procedure does not exceed the shield design loads. Shield design shall account for loads induced by particle impact; however the demolition procedure shall be such that impact forces are minimized. The debris shield shall not be the primary means of debris containment.

iv. The Contractor shall include installation/removal means and methods for the demolition debris shield as part of the proposed Controlled Demolition procedure submission.

v. The demolition debris shield shall provide twenty three feet (23'-0") minimum vertical clearance, or maintain the existing vertical clearance if the existing clearance is less than twenty three feet (23'-0").

vi. Horizontal clearance to the centerline of the track should not be reduced unless approved by the Engineer.

vii. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Engineer.

K. Vertical Demolition Debris Shield

1. This type of shield may be required for substructure removals in close proximity to CSX track and other facilities, as determined by the Engineer.

2. The Agency or its Contractor shall submit detailed plans with detailed calculations, prepared, signed, and sealed by a Professional Engineer, of the protection shield.

V. ERECTION PROCEDURE

A. The Agency or its Contractor shall submit a detailed procedure for erection of a structure with Potential to Foul. The erection procedure must be approved by the Engineer prior to beginning work on the project.

B. Erection work plans shall include a schematic plan depicting the following, at all stages of the construction:

1. All proposed locations of all cranes and equipment, calling out the operating radii.

2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track.

3. All proposed locations for stockpiling material or locations for truck loading.

4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.

C. No crane or equipment may be set on the CSX rails or track structure and no material may be dropped on CSX property.

D. For erection of a structure over the tracks, the following information shall be submitted for review and acceptance by the Engineer, at least thirty (30) days prior to erection:

1. As-built beam seat elevations – field surveyed upon completion of pier/abutment construction.

2. Current Top of Rail (TOR) elevations – field measured at the time of as-built elevation collection.

3. Computations verifying the anticipated minimum vertical clearance in the final condition which accounts for all deflection and camber, based upon the current TOR and as-built beam seat elevations. The anticipated minimum

vertical clearance shall be greater than or equal to that which is indicated by the approved plans. Vertical clearance (see definitions) is measured from TOR to the lowest point on the overhead structure at any point within six feet (6'-0") from centerline of the track. Calculations shall be signed and sealed by a Professional Engineer.

E. Girders or girder systems shall be stable at all times during erection. No crane may unhook prior to stabilizing the beam or girder.

1. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).

2. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer.

3. Temporary bracing shall not be removed until sufficient lateral bracing or diaphragm members have been installed to establish a stable condition. Supporting calculations, furnished by the Professional Engineer, shall confirm the stable condition.

F. Erection procedure submissions shall also include the following information:

1. All hoisting details, as dictated by Section III of this document.

2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., performing aerial splices, installing temporary bracing, installation of diaphragm members, etc.) shall be furnished so that the potential impact(s) to CSX operations may be assessed and eliminated or minimized.

3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.

4. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSX forces, at the expense of the Agency or its Contractor.

5. Design and supporting calculations prepared by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review.

VI. TEMPORARY EXCAVATION AND SHORING

A. The Agency or its Contractor shall submit a detailed design and procedure for the installation of a sheeting/shoring system adjacent to the tracks. Shoring protection shall be provided when excavating with Potential to Foul, or as otherwise determined by CSX. Shoring shall be provided in accordance with the AREMA, except as noted below.

B. Shoring may not be required if all of the following conditions are satisfied:

1. The excavation does not encroach within the Theoretical Live Load Influence Zone. Please refer to Figure 1.

2. The track structure is situated on level ground, or in a cut section, and on stable soil.

3. The excavation does not adversely impact the stability of a CSX facility (i.e., signal bungalow, drainage facility, undergrade bridge, building, etc), or the stability of any structure on, over, or adjacent to CSX property with potential to foul.

4. Shoring is not required by any governing federal, state, local or other construction code.

C. Shoring is required when excavating the toe of an embankment. Excavation of any embankment which supports an active CSX track structure without shoring will not be permitted.

D. Trench boxes are not an acceptable means of shoring. Trench boxes are prohibited for use on CSX property or within the Theoretical Railroad Live Load Influence Zone.

E. Shoring shall be a cofferdam-type, which completely encloses the excavation. However, where justified by site or work conditions, partial cofferdams with open sides away from the track may be permissible, as determined by the Engineer.

F. Cofferdams shall be constructed using interlocking steel sheet piles, or when approved by the Engineer, steel soldier piles with timber lagging. Wales and struts shall be included when dictated by the design.

G. The use of tiebacks can be permissible for temporary shoring systems, when conditions warrant. Tiebacks shall have a minimum clear cover of 6'-0", measured from the bottom of the rail. Upon completion of the work, tiebacks shall be grouted, cut off, and remain in place.

H. All shoring systems on, or adjacent to CSX right-of-way, shall be equipped with railings or other fall protection, compliant with the governing federal, state or local requirements. Area around pits shall be graded to eliminate all potential tripping hazards.

I. Interlocking steel sheet piles shall be used for shoring systems qualifying one or more of the following conditions:

1. Within 18'-0" of the nearest track centerline
2. Within the live load influence zone
3. Within slopes supporting the track structure
4. As otherwise deemed necessary by the Engineer.

J. Sheet piles qualifying for one or more of the requirements listed in Section VI.I (above) of this document shall not be removed. Sheet piles shall be left in place and cut off a minimum of 3'-0" below the finished grade, the ditch line invert, or as otherwise directed by the Engineer. The ground shall be backfilled and compacted immediately after sheet pile is cut off.

K. The following design considerations shall be considered when preparing the shoring design package:

1. Shoring shall be designed to resist a vertical live load surcharge of 1,880 lbs. per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, eight feet six inches (8'-6") wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in AREMA Manual for Railway Engineering, Chapter 8, Part 20.

2. Allowable stresses in materials shall be in accordance with AREMA Chapter 7, 8, and 15.3.

3. A minimum horizontal clearance of ten feet (10'-0") from centerline of the track to face of nearest point of shoring shall be maintained, provided a twelve feet (12'-0") roadbed is maintained with a temporary walkway and handrail system.

4. For temporary shoring systems with Potential to Foul, piles shall be plumb under full dead load. Maximum deflection at the top of wall, under full live load, shall be as follows:

i. One-half (1/2) inch for walls within twelve feet (12'-0") of track centerline (Measured from centerline of the nearest track to the nearest point of the supporting structure).

ii. One (1) inch for walls located greater than twelve feet (12'-0") from track centerline

L. Shoring work plans shall be submitted in accordance with Section II of this document, as well as the following additional requirements:

1. The work plan shall include detailed drawings of the shoring systems calling out the sizes of all structural members, details of all connections. Both plan and elevation drawings shall be provided, calling out dimensions from the face of shoring relative to the nearest track centerline. The elevation drawing shall also show the height of shoring, and track elevation in relation to bottom of excavation.

2. Full design calculations for the shoring system shall be furnished.

3. A procedure for cutting off the sheet pile, backfilling and restoring the embankment.

VII. TRACK MONITORING

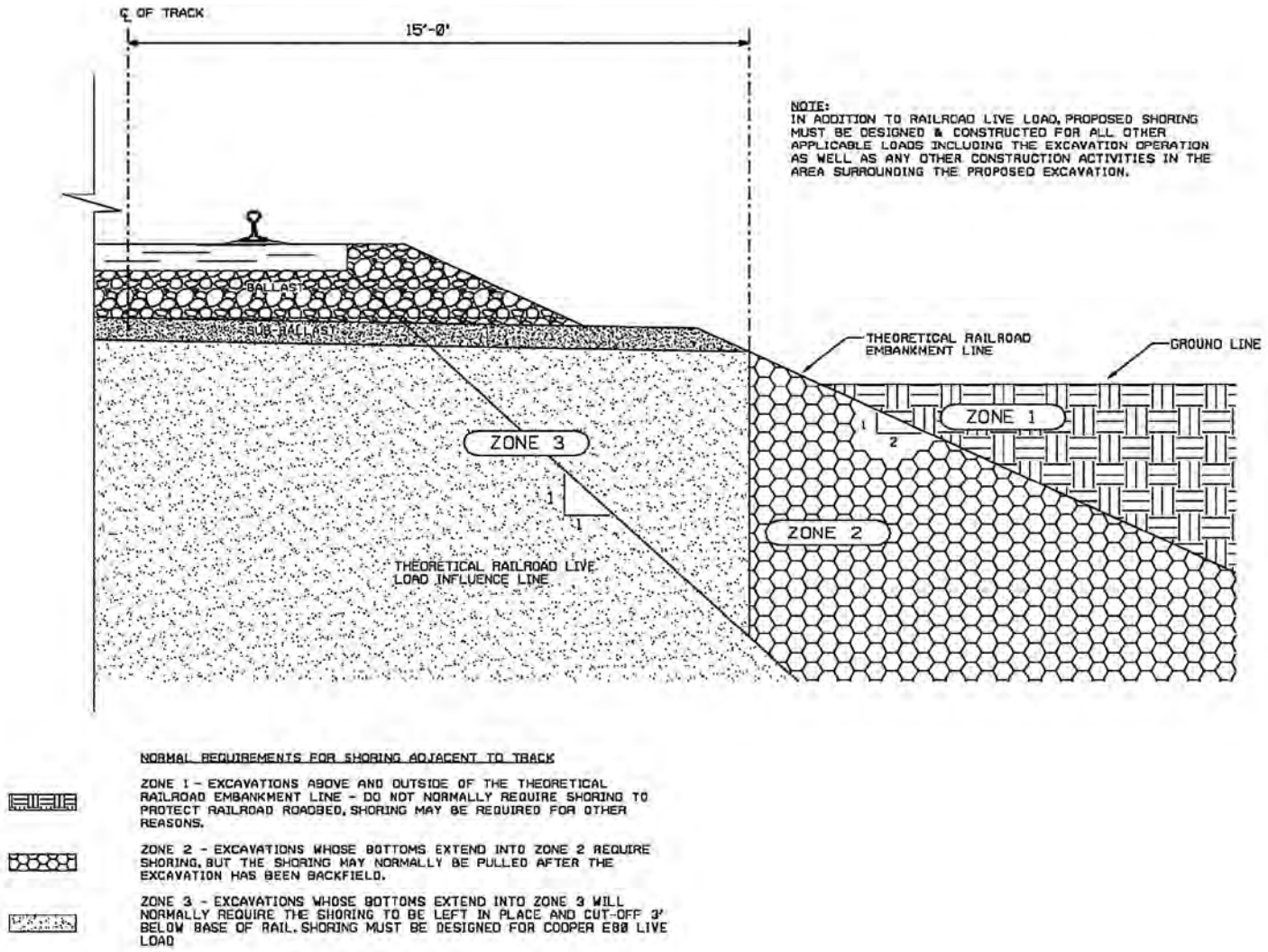
A. When work being performed has the potential to disrupt the track structure, a work plan must be submitted detailing a track monitoring program which will serve to monitor and detect both horizontal and vertical movement of the CSX track and roadbed.

B. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. CSX reserves to the right to modify the survey locations and monitoring frequency as necessary during the project.

C. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Engineer for analysis.

D. If any movement has occurred as determined by the Engineer, CSX will be immediately notified. CSX, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSX or performed by CSX including the monitoring of corrective action of the contractor will be at project expense.

FIGURE 1: Theoretical Live Load Influence Zone



APPENDIX

CSX TRANSPORTATION

DRAINAGE CRITERIA

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

INTRODUCTION

SECTION I: Definitions

SECTION II: CSX General Design Requirements

SECTION III: Plans

SECTION IV: Calculations & Reports

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INTRODUCTION

CSX owns its right-of-way for the primary purpose of operating a railroad. All drainage occupancies shall therefore be designed and constructed so that rail operations and facilities are not interfered with, interrupted, or endangered. In addition, the proposed facility shall be located to minimize encumbrance to the right-of-way so that the railroad will have unrestricted use of its property for current and future operations. No drainage shall be directed towards CSX Right of Way.

The CSX Design & Construction Standard Specifications for Pipelines, last revised June 5, 2018 shall serve as the overarching authority for recommended practice in providing sufficient drainage and protective measures for projects on CSX property. The intent of this document is to provide criteria which supplements, modifies and/or supersedes the applicable sections of the AREMA Manual when designing a project which can affect drainage on or about the CSX ROW. Additionally, these requirements help guide an outside party through the necessary procedures for interacting with CSX and delivering an acceptable design.

I. DEFINITIONS

1. Agency – The project sponsor (i.e., State DOT, Local Agencies, Private Developer, etc.)

2. AREMA – American Railway Engineering and Maintenance-of-Way Association – the North American railroad industry standards group. The use of this term shall be in specific reference to the AREMA Manual for Railway Engineering.

3. Construction Submission – The Agency or its representative shall submit electronic plans and 1 hard copy, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans, specifications, and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.

4. Controlled Demolition – Removal of an existing structure or subcomponents in a manner that positively prevents any debris or material from falling, impacting, or otherwise affecting CSX employees, equipment or property. Provisions shall be made to ensure that there is no impairment of railroad operations or CSX's ability to access its property at all times.

5. Contractor – The Agency's representative retained to perform the project work.

6. Engineer – CSX Engineering Representative or a GEC authorized to act on the behalf of CSX.

7. Flagman – A qualified CSX employee with the sole responsibility to direct or restrict movement of trains, at or through a specific location, to provide protection for workers.

8. GEC – General Engineering Consultant who has been authorized to act on the behalf of CSX. GECs perform preliminary engineering, construction inspection, and monitoring under the direction of the CSX Engineering personnel. GEC personnel also perform day-to-day administration of certain types of projects.

9. Horizontal Clearance – Distance measured perpendicularly from centerline of any track to the nearest obstruction at any elevation between TOR and the maximum vertical clearance of the track.

10. Professional Engineer – An engineer who is licensed in State or Commonwealth in which the project is to occur. All plans, specifications, and supporting calculations shall be prepared by the Professional Engineer and shall bear his seal and signature.

11. Potential to Encroach – Work having the possibility of impacting CSX property or operations; defined as one or more of the following:

a. Any activity where access onto CSX property is required.

b. Any activity where work is being performed on CSX ROW.

c. Any excavation work adjacent to CSX tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the CSX property limits.

d. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Note that hoisting equipment with the potential to foul must satisfy the 150% factor of safety requirement for lifting capacities.

e. Any work where the scatter of debris or other materials has the potential to encroach within twenty five feet (25'-0") of the nearest track centerline.

f. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.

g. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by CSX.

12. ROW – Right of Way; Refers to CSX Right-of-Way as well as all CSX property and facilities. This includes all aerial space within the property limits, and any underground facilities.

13. Submission Review Period - A minimum of 30 days will be required for the initial review response. Up to an additional 30 days may be required to review any/all subsequent submissions or resubmission.

14. Theoretical Railroad Live Load Influence Zone – A 1 horizontal to 1 vertical theoretical slope line starting at bottom corner of tie.

15. TOR – Top of Rail. This is the base point for clearance measurements. It refers to the crown (top) of the steel rail; the point where train wheels bear on the steel rails. Use the higher of the two rails when track is superelevated.

16. Track Structure – All load bearing elements which support the train. This includes, but is not limited to, the rail, ties, appurtenances, ballast, sub-ballast, embankment, retaining walls, and bridge structures.

17. Vertical Clearance – Distance measured from TOR to the lowest obstruction, within six feet (6'-0") of the track centerline, in either direction.

II. CSX GENERAL DESIGN REQUIREMENTS

A. Refer to CSX's Design & Construction Standard Specifications for Pipeline Occupancies, last dated June 5, 2018, for the design requirements for all pipes and drainage structures under the railroad.

B. All pipes, ditches, and other structures carrying surface drainage on CSX property and/or under CSX track(s) shall be designed to carry the run-off from the 100-year, 24-hour design storm without ponding of water against the roadbed.

C. Pipe(s) used to carry surface drainage on CSX's right-of-way shall have a minimum diameter of 36 inches (36").

D. When calculating the capacity of existing or proposed drainage structures, under CSX's track(s), the headwater calculation at the structure shall not be greater than one (1):

$HW/D \leq 1.$

E. Rate and quantity of storm water runoff from any proposed development shall not exceed the rate and quantity of runoff prior to development. This standard shall be maintained for all design storms up to the 100-year storm event.

F. Pipes (casing or carrier) placed under CSX tracks shall not be less than 5.5 (5½'-0") feet from base of rail to top of pipe at its shallowest point.

G. Pipelines laid longitudinally on CSX's right-of-way, 50 feet (50'-0") or less from centerline of track shall be buried not less than 4 feet (4'-0") from ground surface to top of pipe. Where the pipeline is laid more than 50 feet (50'-0") from centerline of track, the minimum cover shall be at least 3 feet (3'-0").

H. Erosion prevention methods shall be used to protect railroad ditches and other drainage facilities during construction on and adjacent to CSX's right-of-way.

I. Permanent erosion and sediment pollution control facilities shall be designed for the 100-year storm. Provide calculations and details of any riprap outlet protection and channel linings as needed within CSX right-of-way.

J. Pipes and culverts within the live load influence shall conform to current AREMA Recommendations and ASTM Specifications. All such structures shall be designed to carry Cooper's E-80 loading with diesel impact. Refer to CSX's Design & Construction Standard Specifications for Pipeline Occupancies approved material types and specifications.

K. CSX right-of-way shall not be utilized for retention, detention or settling basins. Also, the railroad embankment must not be used as any part of a detention pond structure.

L. Track roadbed fills shall not be used as dams or levees for retention of runoff.

M. Temporary sediment basins/traps shall not be constructed against track roadbed fill.

N. Formal approval of the proposed design, by the appropriate governmental agency having jurisdiction, shall be submitted to CSX for their review and acceptance.

O. Pipes and culverts are not to be located within the limits of a turnout or nor closer than 45 feet (45'-0") to any railroad bridge, building or any other important structure.

P. When excavation for a pipeline or other structure will be within the theoretical railroad embankment line of an adjacent track, interlocking steel sheet piling will be required to protect the track(s). Trench Boxes are prohibited for use on CSX within the Theoretical Railroad Live Load Influence Zone. Please refer to the CSX Transportation, Construction Submission Criteria for further details regarding sheeting.

Q. Blasting is not permitted on or adjacent to CSX right-of-way without prior written approval from the Chief Engineer – Design & Construction.

R. Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangement with and as directed by, CSX.

S. Temporary Track Supports may be required when jacking, boring or tunneling method of installation is used, and depending upon the size and location of the drainage crossing. The Agency's contractor shall furnish and supply the CSX approved track supports, with the installation and removal performed by CSX employees. The Agency shall reimburse CSX for all costs associated with the installation and removal of the track supports.

T. Plans submitted to CSX for approval shall be prepared by a Professional Engineer and should indicate design, suitable topographic plan, and outline of total drainage area.

U. If the drainage is to discharge into an existing drainage channel on CSX's right-of-way and/or through a drainage structure under CSX's track(s), the computations must include the hydraulic analysis of any existing ditch and/or structure.

V. Extension of pipes, culverts and other drainage structures previously installed under CSX owned track shall be made with culvert or drainage structure having the same size, shape, and dimensions, as the existing pipe. In no case shall the existing drainage structure be extended so that the hydraulic capacity is decreased or obstructed. In some cases, it may be necessary to extend existing outlets with pipe or culvert of a larger size. Details of connections to mismatched culverts shall be submitted for CSX approval.

W. Agency may be required to provide corrective measures to alleviate an existing drainage problem within CSX property which may be affected by the proposed development. It shall be the responsibility of the Agency to obtain all drainage easements and permits. CSX shall be indemnified and held harmless of any liability.

X. Agency is to provide information on groundwater recharge if infiltration is proposed adjacent to CSX property. Soils testing and certification by a registered professional engineer shall be required.

Y. Emergency spillways discharging onto CSX property are to be designed and constructed so that the basin berm is protected against erosion.

Z. Energy dissipating devices are to be placed at all outlets discharging to CSX property.

AA. Concrete end walls shall be placed at outlets discharging to CSX property. All concrete outlet pipes on CSX property must be equipped with a trash rack.

BB. Under no conditions shall any person be allowed to modify, alter or change a previously approved storm water management (SWM) facility discharging to CSX property unless an approved alternate facility is approved by CSX.

CC. Design of the drainage system, including alterations of the existing drainage system on CSX right-of-way, is the responsibility of the Agency. Drainage shall not be diverted, directed toward CSX, or increased in quantity without prior approval and agreement with CSX.

DD. Supporting calculations must be provided for all proposed drainage and storm water management facilities that discharge onto or impact CSX property.

EE. Occupancies shall be designed, and their construction shall be accomplished, so that adequate and uninterrupted drainage of CSX's rights-of way is maintained.

FF. If, in the course of construction, it may be necessary to block a ditch, pipe, or other drainage facility, temporary pipes, ditches, or other proposed drainage facilities shall be installed to maintain adequate drainage, as approved by CSX. Upon completion of the Project, the temporary facilities shall be removed and the permanent facilities restored.

GG. Temporary and permanent erosion control and sedimentation (E&S) devices must be provided to prevent the flow of sediment onto and adjacent to CSX property.

HH. The design shall take into account and provide upstream areas within the entire watershed in computing discharge, sizing of pipes, inlets, and other structures.

II. When applicable, Agency is to provide maintenance and operation of E&S/Storm water facilities.

III. PLANS

A. Plans shall include the following, but not limited to:

1. Existing property boundaries, easements, etc.

2. Existing drainage features and topography

3. Existing utility locations

4. Existing structures, tracks, roads, features, etc.

5. Existing topography including wetlands and all environmental features

6. Delineate & Dimension proposed property acquisition or property easements

7. Dimension distances from all temporary and proposed E&S and storm water management facilities to CSX's property line and/or easement

8. Dimension distances from all temporary and proposed E&S and storm water management facilities to CSX's tracks

9. Dimension all temporary and proposed encroachments within CSX's property

10. Show existing contours

11. Provide TOR elevations

12. Provide proposed contours, site grading and drainage facilities

13. Provide proposed improvements, including easements and property lines and limit of disturbance

14. Details for all temporary and proposed drainage structures, SWM and E&S Best Management Practices (BMP) devices

15. Detail proposed E&S, SWM, drainage collection & conveyance systems (pipes, ditches, etc.)

    i. Provide location, size, slope & type of pipe.

    ii. Ditch cross sections

    iii. Invert elevations

    iv. Grate and rim elevations

16. If applicable, identify the 100-year floodplain if project is within a specified flood zone.

17. Provide E&S Plans in compliance with all State and Local requirements.

18. Seal and signature of a Professional Engineer who is licensed in the Commonwealth, District, Province, or State in which the project is to occur.

IV. CALCULATIONS & REPORTS

A. Design Calculations:

1. Pre and post development Drainage Area Maps

    i. Provide soils boundary lines & soil types

    ii. Delineate drainage areas

    iii. Time of Concentration (Tc) flow path

    iv. Provide weighted CN and c-values (as applicable to design method)

2. Pre-development 100-year runoff volume and flows for all facilities draining to or on CSX ROW

3. Post-development 100-year runoff volume and flows for all facilities draining to or on to CSX ROW

    i. Verify no increase in rate or quantity of runoff to CSX property from Pre-Development conditions

    ii. Provide hydraulic analysis (depth and velocity calculations) for all facilities draining to or on CSX ROW (existing and proposed) and verify sufficient capacity for proposed flow is provided.

4. Design of proposed collection & conveyance systems (pipes, ditches, etc.)

    i. CSX requires capacity for a 100-year, 24 hour storm

    ii. CSX requires a minimum diameter of 36-inches for pipes within CSX ROW

5. Provide all temporary and permanent E&S and SWM BMP calculations

6. Seal and signature of a Professional Engineer who is licensed in the Commonwealth, District, Province, or State in which the project is to occur.

B. Project narrative/summary describing proposed improvements, drainage design, SWM and E&S methodologies, site soil and geological conditions (if known), flooding characteristics (if applicable) and State and Local requirements used to produce designs.

C. Recommended: Photographs of the site and adjacent CSX property, as well as discharge locations and drainage facilities on CSX property to receive runoff from the proposed development.

V. CONSTRUCTION SPECIFICATIONS

A. Construction shall be in accordance to the CSX Design & Construction Standard Specifications for Pipeline Occupancies, last revised June 5, 2018 or latest revision, under the Construction Requirements section.

B. All work on or near CSX property shall be conducted in accordance with CSX safety rules and regulations. Specifically all Agency's employees and Contractors, while on CSX property, shall be required to wear a hard hart, safety glasses with side shields, 6" lace up boots with a distinct heel, shirts with sleeves, and long pants; additional personal protective equipment may be required based on certain operations. The Contractor and its employees shall comply with the CSX safety rules at all times while occupying CSX's property. Operations will be subject to CSX inspection at any and all times. All personnel operating equipment must be qualified on it to perform task at hand.

C. For the installation of temporary or permanent shoring systems, including but not limited to soldier piles and lagging, and interlocked steel sheeting on or adjacent to CSX's right-of-way, the contractor may be required to submit a detailed track monitoring program for CSX's approval prior to performing any work near CSX's right-of-way. Please refer to CSX Transportation, Construction Submission Criteria for additional information.

D. When water is known or expected to be encountered all plans and specifications must be submitted to the Engineer for approval before the process begins. Pumps of sufficient capacity to handle the flow shall be maintained at the site, provided the contractor has received approval from CSX to operate them. Pumps in operation shall be constantly attended on a 24-hour basis until, in the sole judgment of CSX, the operation can be safely halted. When dewatering, a process for monitoring for any settlement of track or structures must be in place.

E. If any track movement has occurred as determined by the Engineer, CSX will be immediately notified. CSX, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSX or performed by CSX including the monitoring of corrective action of the contractor will be at project expense.

F. Installation by the open cut method is not approved under CSX's mainline tracks, tracks carrying heavy tonnage or tracks carrying passenger trains. Also, open cut shall not be used within the limits of a highway/railroad grade crossing or its approaches, 25 feet (25'-0") either side of traveled way, where possible.

APPENDIX

CSX TRANSPORTATION

SOIL AND WATER MANAGEMENT POLICY

Public Projects Group
Jacksonville, FL
Date Issued: September 2024

Any CSX environmental costs associated with a public project shall be borne by the Agency.

Public projects that generate soils from CSX property must adhere to CSX's soil management policies. CSX requires soils generated from its property to either be properly disposed in a CSX approved disposal facility or reused on CSX property. The management of soils generated from CSX property should be planned for and properly permitted (if applicable) prior to initiating any work on CSX property.

- Soil Reuse: CSX Environmental Department must review and approve reuse of soil on CSX property.

- Soil Disposal: If the soil cannot be reused on CSX property, it must be properly disposed at a CSX approved disposal facility. CSX prohibits any contractor from taking soils for off property reuse. CSX Environmental Department will handle waste characterization and profiling into an approved disposal facility. CSX prohibits any environmental sampling on its property unless granted through a written Environmental Right of Entry or approved in writing by the CSX Environmental Department. For access or right-of-entry issues for outside parties (Right-of-Entry) on CSX property please see: https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/. All analytical analyses must be completed at a CSX approved laboratory.

If Agency has arrangements with a disposal facility not approved by CSX, Agency can request CSX to evaluate the disposal facility. Request to evaluate alternate disposal facilities should take place prior to work being initiated on CSX property. Contact the CSX Manager Environmental Programs at (904) 366-4174 for assistance.

- If dewatering is planned for a public project, CSX Environmental Department must review and approve the dewatering plan prior to work being initiated on CSX property. CSX prohibits the discharge of water onto its property without prior approval. CSX prohibits environmental sampling of groundwater or surface water unless granted through a written Environmental Right of Entry or approved in writing by the CSX Environmental Department. Contact the Manager Environmental Programs at (904) 359-4833 for assistance.

All waste must be removed from the project site in a timely manner. It is the policy of CSX that all materials discarded by or on behalf of CSX will be managed in accordance with local, state and federal regulations as well as CSX's best management practices and sustainability goals. To ensure that these goals are achieved, CSX has mechanisms in place to monitor waste management activities, capture the information necessary to ensure 100% compliance with local, state and federal requirements 100% of the time, and track progress in the CSX sustainability program. These mechanisms also allow CSX to complete reporting requirements to federal and state regulatory agencies and document CSX's progress toward its sustainability goals.

Prior to disposal, recycling, or reuse, a CSX authorization number for transportation and disposal of all waste types (i.e. – hazardous, non-hazardous, special, etc.) must be obtained from the CSX Manager Environmental Programs and included on the disposal manifest or Bill of Lading (BOL). Promptly forward completed hazardous waste, non-hazardous waste, special waste manifests, BOLs, analytical, and profiles to the CSX Project Manager with copies to CSX's Manager Environmental Programs to wastedisposal@csx.com.

Containment system, clean up and disposal of all paint and other material removed from a bridge: The clean-up and disposal of material from the surface preparation for painting and the actual painting must comply with all appropriate regulations and CSX's policies and procedures. The materials removed during the surface preparation must not impact the surrounding area including ground, water, or air impacts. Materials must not be stored on CSX property.

A list of the CSX approved laboratories and disposal/recycling facilities can be obtained from the Manager Environmental Programs at wastedisposal@csx.com.

CSX

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DOCUMENT A00808

PROJECT UTILITY COORDINATION FORM

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Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

8/25/2025
Revision Date:

City/Town:	Project File #:	PUC Completed by:	Utility Pole Set:	
Springfield	609409	Paul Kelly	Eversource	
Route/Street:	**Resident Engineer:**	**Mass DOT PM:**	**Scheduled Ad Date:**	**Total Poles Relocated:**
Armory St. over CSX Mainline and Abandoned CSX		Anthony Christakis	12/20/2025	0

8/27/2025
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Consultant:	Contact:	Office #	Cell #	Email
Tetra Tech, Inc.	Brian Ackley			brian.ackley@tetratech.com

Utility Company	Contact	Office #	Cell #	Email	Scope, Budget, Duration Submitted		Reimbursement			Potential for District Initiated Early Relocation *		Utilities On Bridge/Structure		Utilities Underground (UG) /Aerial (OH)	
					Yes	No	Agreement	Non-Reimb'le	Notes	YES	NO	YES	NO	UG	OH
Eversource Electric	Nicholas Langone	(413) 478-5808		nicholas.langone@eversource.com	X		X				X	X		X	
Eversource Gas	Bryan Meccariello	413-784-2208		bjmeccariello@eversource.com	X		X		Eversource Gas intends to deactivate the existing gas main on the bridge structure over the active CSX railway	X		X		X	
Verizon	Paul Styspeck	413-787-1845		paul.m.styspeck@verizon.com	X		X				X	X		X	
Crown Castle	Mark Bonanno	508-616-7818		mark.bonanno@crowncastle.com	X		X				X	X		X	
Comcast	Wendy Brown	978-848-5163		wendy_Brown@comcast.com	X		X				X	X		X	
MCI/Verizon	Stephen Parretti	508-248-1305		stephen.parretti@verizon.com		X		X			X	X		X	
AT&T	Erica Hudson	781-221-8400 x7041		Erica Hudson <erica.hudson@sienaengineeringgroup.com>	X		X				X	X		X	

Utility Relocation Notes for MassDOT Contractor

Unless otherwise noted by Contract, the MassDOT Contractor is to provide the District Construction Office with 7 Calendar Days advance notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (for DBB Contracts) and/or Section 9 (of DB Contracts). Note: The durations included below do not include these lead-times. See Additional 'Important Basis notes for Contractor' - on last PUC Form page.

Additional notes:

Suggested Sequence of Relocation (Based on Consultant proposed construction staging)

The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the affected utilities listed above. The information provided is the best available information prior to project advertisement.

PUC FORM - CONTINUED

Is 'enabling' (prep) work, by the Contractor, necessary prior to the start of the first series of utility relocations:	Yes	No
	X	

Has any of the Utility work been identified to work concurrently	Yes	No
		X

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massDOT Highway Division

	RESPONSIBLE PARTY: C = Contractor	RESPONSIBLE PARTY: U = Utility	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work: Exclusive Utility on site — Utility working with no other Utilities in vicinity	Concurrent / Exclusive Utility Work: Concurrent Utilities — Utility working with other Utilities on site	Concurrent / Exclusive Utility Work: Contractor Off-Site — No Contractor physical construction operations on-site (while Utility is	Concurrent / Exclusive Utility Work: Contractor Concurrent — Contractor and Utility are working on-site, but NOT in the same vicinity	Access Restraint & Limitations of Operations Notes: Should an AR be considered for the Contractor? — Potential Access Restraint (Yes/No)	Reason/Note (optional)
Pre- NTP			***Utility Co. Eversource Gas***							
		U	Eversource Gas installs new gas works near the intersection of Webster Street and Liberty Street and on Armory Street to isolate 6 inch gas main over S-24-16. Eversource Gas installs new gas works on Taylor Street. Work needs to occur prior to Stage 1A.	30	X			X	NO	
		U	Eversource Gas deactivates 6" gas main over the bridge S-24-016.	3	X			X	NO	
			Sub-Total	**33**						
Stage: 1 Phase: A	C		'Enabling' work by the Contractor - _____The Bridge Contractor completes clearing and grubbing and abandonded structure demolition in areas where utilities are to be relocated. The Contractor completes necessary earthwork near each bridge structure on both the north and south bridge embankments to provide access for utilities. The Bridge contractor constructs utility support structures for all active utilities under S-24-026.							
			UTILITY OPERATIONS - __EVERSOURCE ELECTRIC_____							
Task: 1										
	C		The contractor installs prop (3) - 4" Eversource electric conduits in ground to existing bridges as shown on sequence of the construction staging plans (Stage 1A). The contractor leaves the last 10' length of conduit for Eversource to connect to their manholes.						YES	AR FOR WORK ON BRIDGE
	C		The contractor installs prop (2) - 4" PVC Comcast conduits in the same trench as the existing conduits. The contractor leaves the last 10' length of conduit for Comcast to connect to their manholes.						YES	AR FOR WORK ON BRIDGE
	C		The contractor installs prop (2) - 4" PVC Crown Castle conduits in ground to existing Bridges . The contractor leaves the last 10' length of conduit for Crown Castle to connect to their manholes.						YES	AR FOR WORK ON BRIDGE
	C		The contractor installs prop (6) - 4" PVC Verizon conduits in ground . The contractor leaves the last 10' length of conduit for Verizon to connect to their manholes.						YES	AR FOR WORK ON BRIDGE
	C		The contractor installs (3) - 4" conduits adjacent to existing 3x3 duct bank on S-24-16.						YES	AR FOR WORK ON BRIDGE
		U	**Eversource Electric** will enlarge electric manholes (76/10 and 76/9). Eversource electric will complete the final installation of 10 feet of temporary conduit to each affected manhole.	56	X			X	NO	
		U	**Eversource Electric** will pull (2) primary and (1) secondary cables through the (3)-4" conduits and splice the cables at the Warwick Street and Taylor Street Intersection Manholes and energize the cables. After the new cables are energized , Eversource will de-energize all the cables in the existing 3 by 3 Duct Bank and remove the cables.	20	X			X	NO	
		U	**ATT** must expose existing Fiber Optic Cables near S-24-026 and create slack in the cables to allow for micropile installation	3	X			X	NO	
			Sub-Total	**79**						
Stage: 1 Phase: B	C		'Enabling' work by the Contractor - _____The Bridge Contractor installs Micropiles for S-24-016 and S-24-026. Maintains the temp utility support structures built for all active utilities in Stage 1A for S-24-026. **Note: New Eversource Gas Main will need to be temporarily supported to advance the installation of Micropiles. The existing gas main on structure S-24-026 needs to be in service until the new gas main is activated.**							
			UTILITY OPERATIONS - _____							
Task:1			***Utility Co. Eversource Gas***							
		U	Eversource Gas installs 10" gas pipe over the bridge S-24-026 and activates new Gas Main.	35	X			X	YES	AR FOR WORK ON BRIDGE
			Sub-Total	**35**						
Task: 2			***Utility Co. ATT***							
		U	**ATT** places splitduct over exposed cables and moves to final location	3	X			X	NO	
Stage: 1 Phase: C	C		'Enabling' work by the Contractor - _____The Bridge Contractor completes installation of Abutments , Structural Steel and Utility Conduit on Bridge Structures for Stage 1C							
Task: 1			***Utility Co. Eversource Electric***							
		U	Eversource installs finishes the last 10 foot length of additional conduits and connect to manholes.	6	X			X	NO	
		U	Eversource pulls cables through the proposed permanent conduits, splices cables in manholes, and energizes cables.	10	X			X	NO	
		U	Eversource installs final 10 feet of 3" electric conduit and service cable from the prop manhole to the meter at the prop traffic signal cabinet for prop traffic signal system at Albany Street intersection.	5	X			X	NO	
		U	Eversource de-energizes and removes all of the temporary cables from the (3) -4" Duct Bank	10	X			X	YES	AR FOR WORK ON BRIDGE
	C		The contractor encases the new (4) 4" PVC and (2) 5" PVC duct bank in concrete.						YES	AR FOR WORK ON BRIDGE
			Sub-Total	**34**						

PUC FORM - CONTINUED

Is 'enabling' (prep) work, by the Contractor, necessary prior to the start of the first series of utility relocations:	Yes	No
	x	

Has any of the Utility work been identified to work concurrently	Yes	No
	x	

8/27/2025
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massDOT Highway Division

	RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
	C = Contractor	U = Utility Co.			Exclusive Utility on site: Utility working with no other Utilities in vicinity	Concurrent Utilities: Utility working with other Utilities on site	Contractor Off-Site: No Contractor physical construction operations on-site (while Utility is	Contractor Concurrent: Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
Stage: 2 Phase: A	C		'Enabling' work by the Contractor - _____The Bridge Contractor completes the construction of the New Structures up to Stage 2A. Traffic is diverted to the West Side of the structures. Contractor begins demolition of existing structure (East Side) and installs temporary utility support for Comcast , Crown Castle and Verizon.							
			UTILITY OPERATIONS - _____							
Task: 1			***Utility Co. Comcast***							
	C		The contractor installs prop (2) - 4" PVC Comcast conduits over both bridges as shown on seqence of the construction staging plans (Stage 2A). The contractor leaves the last 5' length of conduit for Comcast to connect to their manholes.						YES	AR FOR WORK ON BRIDGE
		U	Comcast installs two manholes at Albany Street and Taylor Street intersections and finishes the last 5' length of conduits.	21	X			X	NO	
		U	Comcast pulls cables through the new conduits (144/24 count fiber, 288 count fiber and new coax) Comcast needs to install new cables with enough slack to install Micropiles and move into final positions	21	X			X	NO	
		U	Comcast splices new coax and fiber to existing coax and fiber	183	X			X	NO	
		U	Comcast removes existing fiber and coax cable	3	X			X	NO	
			Sub-Total	**228**						
Task: 2			***Utility Co. Verizon***							
	C		The contractor installs prop (6) - 4" FRE Verizon conduits over bridges.						YES	AR FOR WORK ON BRIDGE
		U	Verizon places two new manholes at Albany Street intersection and the north side of bridge S-24-016 and connects the last 5' length of conduits to the prop manholes.	5	X			X	NO	
		U	Verizon places new cables in newly constructed duct banks and places fiber loops.	16	X			X	NO	
		U	Verizon splices in new cables.	29	X			X	NO	
		U	Verizon removes old cables.	7	X			X	NO	
			Sub-Total	**57**						
Task: 3			***Utility Co. Crown Castle***							
	C		The contractor installs prop (2) - 4" PVC Crown Castle conduits over both bridges in the same bay as Comcast conduits as shown on sequence of the construction staging plans (Stage 2A).						YES	AR FOR WORK ON BRIDGE
		U	Crown Castle installs utility vaults and the last 5' length of conduits, places cables, splices cables in existing manholes, and activates cable.	30	X			X	NO	
			Sub-Total	**30**						

	RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
	C = Contractor	U = Utility Co.			Exclusive Utility on site: Utility working with no other Utilities in vicinity	Concurrent Utilities: Utility working with other Utilities on site	Contractor Off-Site: No Contractor physical construction operations on-site (while Utility is	Contractor Concurrent: Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
Stage: 2 Phase: B	C		'Enabling' work by the Contractor - _____The Bridge Contractor completes installation of Structural Steel and Final Conduit locations for Verizon , Crown Castle and Comcast							
			UTILITY OPERATIONS - _____							
Task: 1			***Verizon***							
		U	Verizon moves to final location on Structure S-24-026	30	x			x	YES	AR FOR WORK ON BRIDGE
			Sub-Total	**30**						
Task: 2			***Crown Castle***							
		U	Crown Castle moves to final location on Structure S-24-026 and S-24-016	30	x			x	YES	AR FOR WORK ON BRIDGE
			Sub-Total	**30**						
Task: 3			***Comcast***							
		U	Comcast moves to final location on Structure S-24-026 and S-24-016	30	x			x	YES	AR FOR WORK ON BRIDGE
			Sub-Total	**30**						
Stage: 3	C		'Enabling' work by the Contractor - _____The Bridge Contractor completes roadway work and places binder pavement course and sidewalk gravel grading.							
			UTILITY OPERATIONS - _____							
Task: 1	U		***Utility Co. Verizon, Eversource Electric, Eversource Gas, Crown Castle, Comcast,ATT***							
		U	Verizon adjusts structures to final grade	10		x		x	NO	
		U	Eversource Electric adjusts structures to final grade	10		x		x	NO	
		U	Eversource Gas adjusts structures to final grade	5		x		x	NO	
		U	ATT adjusts structures to final grade	5		x		x	NO	
		U	Crown Castle adjusts structures to final grade	5		x		x	NO	
		U	Comcast adjusts structures to final grade	5		x		x	NO	
			Sub-Total	**40**						

1	Unless otherwise specified in the MassDOT Construction Contract, or unless specifically noted within this PUC Form, these durations (herein) are based upon the Contractor providing *unimpeded access* to the Utility company to perform Utility relocations (see Note 5 - Access).
2	"Concurrent Utilities" operations noted herein, are to signify those Utility Company operations that can be worked concurrently (e.g. Utility A and Utility B work on-site together) - MassDOT and the Contractor are to prepare NTPs to Utilities accordingly.
3	"Potential Access Restraints" noted within this PUC Form are for planning purposes. See MassDOT Contract for Contractual Access Restraints (refer to Subsections 8.02, 8.03, and/or 8.06 for Design Bid Build Contracts and Volume II Section 9 for Design Build Contracts).
4	Utility non-work periods - For planning purposes, the durations above contain some non work days (contingency) for New England conditions (precipitation, high temperatures, low temperatures, snow, ice). Gas line work however, typically has a seasonal restriction and can NOT be installed from 15-November to 15-March. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-March. The Contractor shall (and the CTD plan) reflect this calendar restriction within the schedule (unless otherwise note).
5	Access - Unless otherwise noted in the Contract, and in addition to the 'enabling' notes above, the Contractor must provide safe and unimpeded access (for trucks, lifts, cranes, etc.) to the Utilities, to allow for the proposed relocation(s) - including but not limited to snow removal, clearing and grubbing, guard rail removal, barrier removal, tree removal, and grading.
6	For all MassDOT construction contracts issued after January 2014, the new Utility Coordination/documentation specification is required. This is Section 8.14 in Design-Bid-Build Contracts (see Design-Build index reference for applicable section #).
7	Prior to starting any and all enabling work for Utilities, the Contractor is to plan in advance with submittals and approved durations.
8	* Potential District Initiated Early Utility Relocation - if noted herein, the District reserves the right to initiate early utility relocation in advance of the Contract NTP. In submitting a bid price and in the development/basis of the Baseline Schedule, the Contractor shall not plan the Work with the potential benefit of any form of 'early utility relocation.' As a requirement of the Baseline submission, unless otherwise noted in this Specification, the earliest that the first Utility company is to receive the 30 days advance notification to mobilize to the site, will be 7 calendar days after the pre-construction meeting and never sooner than 7 days after the Contract NTP.

DOCUMENT A00820

Massachusetts Department of Transportation
Conditions of Custody

REQUEST FOR RELEASE OF MASSDOT AUTOCAD FILES FORM
(Only to be used following award of contract)

City/Town: SPRINGFIELD Project File Number: 609409

Contract Number: 133236

Project Description: Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX

All AutoCAD files are provided solely as a courtesy to facilitate public access to information. MassDOT attempts to provide current and accurate information but cannot guarantee so. MassDOT provides such documents, files or other data "as is" without any warranty of any kind, either expressed or implied, including but not limited to, accuracy, reliability, omissions, completeness and currentness. The Commonwealth of Massachusetts and its Consultants shall not be liable for any claim for damages, including lost profits or other consequential, exemplary, incidental, indirect or special damages, relating in any way to the documents, files or other data accessible from this file, including, but not limited to, claims arising out of or related to electronic access or transmission of data or viruses. Because data stored on electronic media can deteriorate undetected or be modified without our knowledge, MassDOT cannot be held liable for its completeness or correctness. MassDOT makes no representation as to the compatibility of these files beyond the version of the stated CAD software.

By signing this form, I agree that it shall be my responsibility to reconcile this electronic data with the conformed contract documents, and that only the conformed contract documents shall be regarded as legal documents for this Project. I understand that this authorization does not give me the right to distribute the files. I agree to the terms above and wish to receive the AutoCAD files.

This signed form shall be emailed to the Highway Design Engineer at the MassDOT -Highway Division at the following email address:

DOTHighwayDesign@dot.state.ma.us
Attn: AutoCAD Files

Name of person requesting AutoCAD files: _____

Affiliation/Company: _____

Address: _____

_____

Telephone number: _____

Email address: _____

Signature/Date: _____

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DOCUMENT A00875

POLICY DIRECTIVE P-22-001
AND
POLICY DIRECTIVE P-22-002

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massDOT Massachusetts Department of Transportation Highway Division

Number: P-22-001
Date: 9/23/22

POLICY DIRECTIVE

Jonathan Gulliver (signature on original)
HIGHWAY ADMINISTRATOR

Off-Site Stockpiling of Soil from MassDOT Construction Projects

Purpose

The purpose of this Policy Directive is to formally establish a policy and procedures for managing and stockpiling soil generated and transported from MassDOT construction projects. This Policy Directive does not supersede any Federal, State, or Local regulations.

Date of Effect

This Policy Directive is effective immediately for all projects, including active construction projects.

For active construction projects and for other projects advertised prior to October 15, 2022, changes to the contract documents needed to implement the requirements of this Policy Directive will be considered on a case-by-case basis and shall be approved by the District Highway Director, as necessary.

For projects advertised on or after October 15, 2022, MassDOT will include the requirements and implementation procedures of this Policy Directive in the construction contract documents.

Policy Requirements

This policy is intended to prevent the off-site relocation of excavated soil generated from MassDOT projects to areas near residential receptors and to control potential fugitive dusts and/or contaminants. To that end, excavated soil may not be moved from the project site without knowledge of the content of the material. Knowledge may include visual field observations for presence of staining, odor, and/or debris, screening with a photoionization detector (PID), laboratory analysis, and/or site history. Pavement millings and other non-soil materials are not subject to the requirements of this Policy Directive.

Moving soil from a MassDOT project site to a temporary off-site storage location must be approved in writing by the District Highway Director.

The Contractor must select a storage location that is at least 500 feet away from residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially

zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.

Temporary off-site storage of excavated soil from a MassDOT project is only permissible at a location approved and permitted by MassDOT. The temporary storage location should be located within the same municipality where the soil was excavated, where possible. Stockpiled soil must be securely covered, and appropriate measures must be taken to minimize fugitive dust and erosion.

Signs indicating the source of the soil, the date the soil was generated, and contact information must be erected and maintained until the stockpiled soils are transported to a disposal facility or reused on the project site.

Implementation Procedures

To ensure that off-site storage of excavated soils is managed properly on MassDOT projects, this policy requires the following:

1. **Off-Site Stockpile Storage Locations**
    a. The Contractor shall provide proposed off-site storage locations to the Engineer for approval at least 30 days prior to transporting soil off site. Off-site storage locations should be in the same municipality as the work site.
    b. The Contractor shall keep excavated soil on site until adequately characterized to the satisfaction of the Engineer.
    c. The Contractor shall provide notification of the approved off-site storage location to the local Board of Health and the Town Manager's/Mayor's Office at least 7-days prior to transporting soil off site.
    d. The Contractor shall provide the Engineer with at least 3-days' notice prior to transporting soil off site.
    e. For off-site storage locations on MassDOT property, the Contractor is required to obtain an Access Permit through the District Permits Office prior to storage of soil or other materials. MassDOT will issue these permits at no cost to the Contractor. Information to be submitted by the Contractor as part of the permit application shall include:
        i. A description of material to be stored off-site, including available analytical data;
        ii. A figure of the location with distances to residences and residential receptors; and
        iii. Anticipated duration of temporary storage.
    f. Stockpile locations should not be within 500 feet of residential receptors (e.g., residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities).
        i. If the stockpile location must be within 500 feet of residential receptors, then soil must be less than RCS-1 (per 310 CMR 40.1600) and free of potentially hazardous or regulated items.

g. For off-site storage locations on non-MassDOT property, the Contractor must notify the property owner(s) at least 7 days prior to transporting material.
h. Exceptions to these rules will be reviewed by MassDOT and may be approved by the District Highway Director on a case-by-case basis.

2. Off-Site Stockpile Management

a. The Contractor shall keep soil stockpiles on impermeable surfaces (e.g., asphalt or concrete) or on 10-mil polyethylene sheeting.
b. The Contractor shall cover soil stockpiles with 10-mil polyethylene sheeting and surround with a berm made of hay bales, straw wattles, or similar.
    i. Piles that are actively being worked on must be covered and re-secured at the end of the work shift.
c. The Contractor shall label stockpiles with signs, including:
    i. Location of origin (including any Release Tracking Numbers)
    ii. Stockpile ID number (including MassDOT District office-assigned tracking ID, if different)
    iii. Date of initial accumulation
    iv. Applicable telephone numbers for the Contractor and MassDOT.
d. The Contractor shall mitigate fugitive dust at storage locations under the direction of an appropriately trained/certified environmental professional.
e. The Contractor shall remedy noncompliance with this policy within 48 hours.
f. The Contractor shall remedy noncompliance with this policy on the SAME DAY for potentially hazardous material, as determined by the Engineer.
g. The Contractor shall handle excavated soil according to federal, state, and local regulations.
h. The Contractor shall use appropriate shipping documents for all movements of excavated soil on public roadways (e.g., Bill of Lading, Material Shipping Record, Manifest, Asbestos Waste Shipment Record, etc.).

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massDOT Massachusetts Department of Transportation Highway Division

Number: P-22-002
Date: 9/23/22

POLICY DIRECTIVE

Jonathan Gulliver (signature on original)
HIGHWAY ADMINISTRATOR

Use of MassDOT Property for Staging and other Construction-Related Operations

Purpose

This Policy Directive is intended to address the use of MassDOT property by MassDOT Contractors for construction staging and other construction-related operations that are not specifically defined in the construction contract. Such use of MassDOT property will only be allowed if permitted by the District Office in accordance with 700 CMR 13.00, Approval of Access to MassDOT Highways and Other Property. This includes the use of MassDOT property for staging, laydown, and storage of equipment and materials, including soil excavated from a project site.

This Policy Directive requires the Contractor/applicant to obtain a Non-Vehicular Access Permit from MassDOT to use MassDOT property for these purposes.

This Policy Directive is effective immediately and applies to all MassDOT construction projects.

General Permit Considerations and Conditions

In addition to other normal MassDOT Access Permit procedures, MassDOT shall consider the following during the application, review, implementation and monitoring processes of Access Permits required by this Policy Directive:

- Storage and placement of the Contractor's equipment and materials should not be allowed within the clear zone of the roadway.
- Stockpiled soils should not be located within 500 feet of residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.
- The Contractor/applicant shall identify the access/egress locations of the proposed storage areas. MassDOT will only approve locations determined to be safe for roadway users, construction workers and the general public.
- The Contractor may be required to submit a Traffic Management Plan and/or Lighting Plan for MassDOT review and approval as part of the permit application, depending on the proposed use of the area.

- The Contractor shall submit the permit application through MassDOT's online State Highway Access Permit System (SHAPS).
- MassDOT will waive the permit application fee for any application received from a MassDOT Contractor for any permit required by this Policy Directive and will waive any subsequent amendment and extension fees that may otherwise be required.
- MassDOT will review the permit application in accordance with applicable standard procedures and will apply standard permit terms and conditions, as necessary.
- The Resident Engineer will verify that the permit is approved before allowing the Contractor to use the affected area for the requested purpose.
- Areas permitted are for use by the approved applicant only and are not to be shared with or used by other vendors. Subcontractors specifically engaged with the applicant working on the specific MassDOT project will be allowed to use the area in accordance with the terms of the permit.
- Permits are issued on an annual basis and will require the Contractor to file for an extension each year to continue use.

Exemptions from Permit Requirements

Equipment and materials being used for active construction operations and located within the work zone of the construction contract are exempt from this permit requirement, provided they do not interfere with the safety or operation of the roadway or the work zone. Examples of these types of exempt uses are:

- Equipment and materials parked or stored within a protected (barriered) work zone.
- Materials placed in the work zone prior to same-day installation or use.
- Soils excavated temporarily and scheduled to be replaced, such as for trenching operations or for installation of drainage structures.

DOCUMENT A00877

U.S. FISH AND WILDLIFE SERVICE

NLAA CONCURRENCE VERIFICATION LETTER

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 3301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: 10/06/2025 14:24:47 UTC
Project code: 2024-0006232
Project Name: 609409 SPRINGFIELD- BRIDGE REPLACEMENT, S-24-016, ARMORY ST OVER CSX

Subject: Not Likely to Adversely Affect Concurrence verification letter for the '609409 SPRINGFIELD- BRIDGE REPLACEMENT, S-24-016, ARMORY ST OVER CSX' project under the December 13, 2024, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat, Northern Long-eared Bat, and Tricolored Bat.

To whom it may concern:

This letter records the determination of effects to federally listed (or proposed) bat species anticipated to result from the 609409 SPRINGFIELD- BRIDGE REPLACEMENT, S-24-016, ARMORY ST OVER CSX (the Project). This determination is based upon information you entered into the assisted determination key (Dkey) associated with the above referenced Programmatic Biological Opinion/Conference Opinion (PBO/PCO) in the U.S. Fish and Wildlife Service's (Service) Information for Planning and Consultation (IPaC) system on the date listed above to verify that the Project may rely on the concurrence provided in the PBO/PCO to satisfy requirements under section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (16 USC 1536), as amended.

Ensuring Accurate Determinations When Using IPaC:

The Service developed the IPaC system and this Dkey in accordance with the ESA and based on the PBO/PCO. All information submitted by the project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in the Dkey invalidates this letter. Answers to certain questions in the Dkey commit the project proponent to implementation of conservation measures that must be followed for the ESA determinations to remain valid. Carefully review this letter, your ESA requirements are <u>NOT</u> yet complete.

Determinations:

Based on the information you provided (Project Description shown below), you have determined that the Project is within the scope and adheres to the criteria of the PBO/PCO, including the adoption of applicable avoidance and minimization measures. Based on your IPaC submission and the PBO/PCO, the Project is consistent with the following effect determinations:

Species	Listing Status	Determination
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	NLAA

The tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can confer under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a no effect or not likely to adversely affect (NLAA) determination from the key to confirm that the determination is still accurate.

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Project does not meet the criteria for a NLAA determination under the PBO/PCO. **If the Service does <u>not</u> notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Project under the terms of the NLAA concurrence provided in the PBO/PCO**. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO/PCO.

If the Project is modified, or new information reveals that it may affect the Indiana bat, northern long-eared bat, or tricolored bat in a manner or to an extent not considered in the PBO/PCO, further review to conclude the requirements of ESA section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:

If your initial bridge, culvert, or structure assessment failed to detect Indiana bat, northern long-eared bat, or tricolored bat use or occupancy, yet bats are later detected prior to, or during construction, promptly notify the local Service Field Office within 2 working days of the discovery. In addition, please document whether incidental take occurred, and if so, the type (i.e. kill or harm) and amount (i.e. number of individuals) and submit documentation to the local Service Field Office within 5 working days from the completion of the bridge, culvert, or structure construction (use Appendix E - Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form in the User's Guide). In these instances, potential incidental take of Indiana bats, northern long-eared bats, or tricolored bats may be exempted provided that the take is reported to the Service. In these instances, potential incidental take of Indiana bats, northern long-eared bats, or tricolored bats may be exempted provided that the take is reported to the Service.

If the Project may affect any other federally listed or proposed species and/or designated critical habitat, additional consultation between the lead Federal action agency and this Service Field Office is required for those species/designated critical habitat. If the Project has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please advise the lead Federal action agency to contact this Service Field Office

The following species may occur in your project area and **are not** covered by this determination:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

NAME

609409 SPRINGFIELD- BRIDGE REPLACEMENT, S-24-016, ARMORY ST OVER CSX

DESCRIPTION

609409 SPRINGFIELD- BRIDGE REPLACEMENT, S-24-016, ARMORY STREET OVER CSX MAINLINE & S-24-026, ARMORY STREET OVER ABANDONED CSX

The Massachusetts Department of Transportation (MassDOT) proposes the replacement of two bridges at Armory Street over CSX mainline and Armory Street over CSX abandoned rail line and associated roadway, utility and traffic signal work. The Project extends from the intersection of Genesee, Warwick and Armory Street to the intersection of Taylor, Agnew and Armory Street and includes the intersection of Albany Street and Armory Street in Springfield Massachusetts.

Monarch Butterfly: Proposed Threatened Species. Due to MassDOT's enrollment in the Monarch Butterfly Nationwide CCAA, the action is Not Likely to Jeopardize the continued existence of the monarch butterfly.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.11523525,-72.58151518688217,14z

DETERMINATION KEY RESULT

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the Indiana bat, northern long-eared bat or tricolored bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 et seq.) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the Programmatic Biological Opinion/Conference Opinion for Transportation Projects in the Range of the Indiana bat, northern long-eared bat, and tricolored bat, dated December 13, 2024.

QUALIFICATION INTERVIEW

1. Which Federal Agency is the lead federal agency the action?

   A) Federal Highway Administration (FHWA)

2. Does the Action Area intersect the species list area of the tricolored Bat (TCB)?

   Automatically answered
   Yes

3. [Semantic] Is any portion of the action area within a 0.5 mile radius of an entrance/opening to any known NLEB or TCB hibernacula?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact the Field Office listed in the letterhead of this letter.

   Automatically answered
   No

4. Does your project's activities include raising the road profile above the tree canopy in documented habitat for the Indiana bat, NLEB, or TCB?

   Note: For the definition of documented habitat, refer to Appendix A: https://www.fws.gov/media/users-guide-range-wide-programmatic-consultation-indiana-bat-and-northern-long-eared-bat

   No

5. Is your project located within a karst area?

   No

6. Will the project include bridge, culvert, or structure removal, replacement, and/or alteration activities?

   Note: For definitions of bridge, culvert, and structure, refer to Appendix A: https://www.fws.gov/media/users-guide-range-wide-programmatic-consultation-indiana-bat-and-northern-long-eared-bat.

   Yes

7. Do your project’s activities involve tree removal/trimming, temporary lighting, new/additional permanent lighting, ground disturbance, percussives that involves noise/vibration above existing background levels, vibrations, or slash pile burning?

   Yes

8. Is there suitable summer habitat for the Indiana bat, NLEB, or TCB within the project action area?

   Note: See the Service's summer survey guidance for current definitions of suitable habitat [https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html].

   Yes

9. Have P/A surveys for the Indiana bat, NLEB, or TCB been conducted within the suitable summer habitat located within your project action area? This refers to mist-netting or acoustic surveys, not bridge assessments.

   Note: See the Service's survey guidance https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html

   Yes

   SUBMITTED DOCUMENTS

   - *609409_Springfield_PA-Bridge_survey_report_FINAL.pdf https://ipac.ecosphere.fws.gov/project/EHT4G64T7BAMFPSMRYUCIB6SKM/projectDocuments/171114850*

10. Did the P/A surveys detect Indiana bats, NLEBs, or TCBs?

    Note: If Indiana bats, NLEBs, or TCBs are detected, the action area is considered **documented habitat.**

    No

11. Did the local Service Field Office verify that this P/A survey can be used to determine Indiana bat, NLEB, and TCB are **not likely to be present** within the suitable summer habitat located within your project area?

    Yes

12. Will the project include **bridge** removal, replacement, and/or alteration activities?

    Yes

13. Has a Bridge Bat Assessment been conducted **within the last 24 months** to determine if the bridge is being used by the Indiana bat, NLEB, or TCB? If yes, upload assessment.

    Note: Refer to the Service's current survey guidance for acceptable assessment practices and validity timeframe of bridge/culvert and structure bat assessments: https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

    SUBMITTED DOCUMENTS

    - *609409 Springfield Bridge Assessment_ Letter.pdf https://ipac.ecosphere.fws.gov/project/EHT4G64T7BAMFPSMRYUCIB6SKM/projectDocuments/171114917*

14. Please select one of the following results of the Bridge Bat Assessment:

    c) *Indicates the **absence** of Indiana bats, NLEBs, or TCBs roosting in/under the bridge (no bats, guano, etc.)?*

15. Does the project include **culvert** removal, replacement, and/or alteration activities?

    No

16. Does the project include **structure** removal, replacement, and/or alteration activities?

    No

17. Does the Action Area intersect the species list area of the tricolored Bat (TCB)?

    Automatically answered
    Yes

PROJECT QUESTIONNAIRE

1. Have you made a No Effect determinations for all other species included on the FWS IPaC generated species list?

   Yes

2. Have you made a May Affect determination for any other species on the FWS IPaC generated list?

   No

3. Please enter the date of the bridge assessment.

   7/18/2025

AVOIDANCE AND MINIMIZATION MEASURES (AMMS)

This determination key result includes the commitment to implement the following Avoidance and Minimization Measures (AMMs):

GAMM1
Ensure all operators, employees, and contractors working in areas of Indiana bat, NLEB, or TCB suitable habitat are aware of all Transportation Agency environmental commitments, including all applicable AMMs.

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING IBAT, NLEB, OR TCB

This key was last updated in IPaC on September 11, 2025. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) and may affect the federally listed endangered Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), and/or federally proposed endangered tricolored bat (*Perimyotis subflavus*).

This decision key should only be used to verify project applicability with the Service's Programmatic Biological Opinion/Conference Opinion for Transportation Projects in the Range of the Indiana bat, northern long-eared bat, and tricolored bat, dated December 13, 2024. The programmatic consultation limited transportation activities that may affect the covered bat species and addresses situations that are both likely and not likely to adversely affect the covered bat species. This decision key will assist in identifying the effect of a specific project/activity and the applicability of the programmatic consultation. The programmatic consultation is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic consultation, or that may affect ESA-listed species other than the Indiana bat, northern long-eared bat, or tricolored bat, or their designated critical habitat, may require additional ESA Section 7 consultation.

IPAC USER CONTACT INFORMATION

Agency: Massachusetts Department of Transportation
Name: Emily Puglisi
Address: 10 Park Plaza
City: Boston
State: MA
Zip: 02116
Email emily.a.puglisi@dot.state.ma.us
Phone: 6178964424

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

DOCUMENT A00881

HAZMAT REVIEW MEMORANDUM

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TETRA TECH

MEMO

To:	James Dalton, MassDOT Project Manager
From:	Matthew T. Madden and Kaitlyne M. Leblanc
Date:	January 21, 2021
Subject:	Springfield - Armory Street over CSX Mainline and CSX Abandoned Bridge Nos. S-24-16 and S-24-26 Springfield, Massahcusetts

Introduction:

This memorandum summarizes the findings of a review of environmental conditions of the Armory Street corridor between the Genesee Street/Warwick Street/Armory Street intersection and the Taylor Street/Armory Street intersection in Springfield, Massachusetts (the Site).

Armory Street is a two-lane roadway with sidewalks and bridge railings on both sides. The project includes three intersections – Genesee Street/Warwick Street/Armory Street intersection at the northern end of the project, Taylor Street at the southern end of the project, and Albany street between the bridges at the southern end of Bridge No. S-24-016 (over CSX mainline).

The proposed intersection improvements include smoothing the existing profile between Genesee Street and Taylor Street, improving pedestrian accessibility, and widening the bridge roadways.

The purpose of this memorandum is to document: (1) The historical use of the project location and surrounding properties through the use of historic aerial photos, Sanborn Insurance Maps, local research, and online data resources; (2) A visual inspection via online aerials of the project location and adjacent properties; and (3) A review of the known or suspected disposal sites in the vicinity of the project location.

Site and Surrounding Properties History:

The Site history was constructed based on municipal records research, aerial photographs, Sanborn Fire Insurance Maps, and historic topographic maps. Aerial photographs dated 1940, 1957, 1960, 1969, 1971, 1980, 1991, 1997, 2003, 2004, 2006, 2008, 2010, 2012, 2014, 2016, and 2018 and Sanborn Fire Insurance Maps dated 1886, 1896, 1911, 1931, and 1950 were obtained from the Environmental Risk Information Services (ERIS) report to assess the past uses of the Site and surrounding area. Tetra Tech viewed topographic maps online via www.historicalaerials.com. Historic topographic maps reviewed were dated 1894, 1900, 1901, 1902, 1905, 1908, 1911, 1917, 1918, 1929, 1938, 1943, 1952, 1958, 1961, 1967, 1973, 1979, 1987, 2012, and 2015. Copies of historic aerials and Sanborn Maps are included in Appendix B.

Marlborough Technology Park
100 Nickerson Road, Marlborough, MA 01752
Tel 508.786.2200 Fax 508.786.2201 tetratech.com

Historic Land Use Resources Consulted	Dates Reviewed	Source(s)
Aerial Photographs	1940, 1957, 1960, 1969, 1971, 1980, 1991, 1997, 2003, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018	ERIS Report
USGS Topographic Maps (Falmouth and Pocasset quadrangles):	1894, 1900, 1901, 1902, 1905, 1908, 1911, 1917, 1918, 1929, 1938, 1943, 1952, 1958, 1961, 1967, 1973, 1979, 1987, 2012, 2015	www.historicalaerials.com
Sanborn Fire Insurance Maps	1886, 1896, 1911, 1931, 1950	ERIS Report
Municipal Records	Requested August 5, 2020	Springfield Fire Department and Health and Human Services Department

Based on review of historic topographic maps and aerials, the existing Armory Street and Taylor Street roadways have been in their general configurations since at least 1889. Genesee Street appears to have been constructed in its existing configuration in the 1933 topographic map. The existing and former railroad tracks are shown running under Armory Street dating back to 1889. The majority of the surrounding properties have been developed since approximately 1957 and used for industrial purposes. The surrounding properties to the east and west (176 Armory Street and 40, 45 and 47 Albany Street) of the Site appear to have been used as storage yards from approximately 1957 until present. Four aboveground storage tanks previously occupied the eastern abutting property (145 Armory Street) from approximately 1960 to 2004.

The 225 Armory Street property abuts the Site to the east/north and is a 3.171-acre parcel of land located at the intersection of Napier Street and Armory Street. This parcel of land is currently occupied by a fuel storage and distribution terminal. According to the Response Action Outcome Statement dated May 4, 2013 this property has six aboveground bulk storage tanks of up to 1,050,000 gallons individual capacity, three 10,000-gallon fuel additive aboveground storage tanks (ASTs), one 20,000 gallon oil/water separator, a functional but inactive vapor recovery system, and an active fuel oil loading dock currently located on the property. This facility reportedly receives fuel directly from the JetLine distribution pipeline, which runs parallel to the railroad tracks that pass along the southern parcel boundary of the property. This property was used historically for the storage and distribution of coal and gasoline, with bulk gasoline storage beginning circa 1950. This property reportedly began operating as a fuel terminal in 1986 and has been used as a fuel terminal until the present. Based on the 1896 and 1911 Sanborn maps this property was formerly occupied by J.P. Falt, a stone cutting distributer. M.S Converse Coal Co. is shown as having occupied the property in the 1931 and 1950 Sanborn maps.

The distribution pipeline which abuts the Site to the east and west, currently referred to as the Buckeye Pipeline Company, appears to have occupied the Armory Street parcel since at least 1957 to present.

The 487 Taylor Street/140 Armory Street property abuts the Site to the west and is currently occupied by a self-service Sunoco gasoline station with a convenient store. Historically this property has been occupied by a self-service retail gasoline station, a convenience store, a laundromat, and a car wash maintenance facility. The laundromat consisted on self-service washers and driers. No dry-cleaning was ever preformed at this location. Dry-cleaning pick-up and delivery services were however offered by the laundromat. Based on the 1911, 1931 and 1950 Sanborn maps this property was historically occupied by residential dwellings.

The 145 Armory Street property abuts the Site east and is currently occupied by a small vacant building. This parcel of land has historically been occupied by the Shea Brother Manufactures of Coated Paper Products (1911), an automotive garage with a coal yard (1931), and City Coal Company (1950). Springfield Terminals reportedly purchased this property in December 1985. A former 500,000-gallon AST reportedly occupied this property and feed the Buckeye Pipeline Supply Line which is located to the north of this parcel.

The 83-85 Warwick Street property of land is currently occupied by EcoBuilding Bargains and abuts the Site to the west. This property was historically used as a furniture warehouse by Kavanagh Furniture and as a warehouse for Steigher's department store from the 1940's to about 1970. Prior to 1940, the property was used by banking companies.

The 450 Taylor Street property abuts the Site to the west and is currently vacant/undeveloped land. This property was owned by several different railroad companies between 1890 and 1980. During this time additional portions of the property were leased by other tenants including Moses Erlich Company/Joseph Freedman Company, Inc. for use as a scrap yard and T.J. Sullivan Coal Company in 1962. Scrap operations in 1991 reportedly involved the reclamation of electrical transformers.

Joseph Freedman Company, Inc. a scrap metal company currently occupies 40, 45, 47, and 176 Armory Street. Joseph Freedman Company appears to have occupied these parcels of land since at least 1971.Based on the 1886, 1896, 1911, and 1931 Sanborn maps, the eastern abutting property currently identified as 40, 45, and 47 Albany Street was formerly occupied by Hampden Paint Chemical Co., identified as Hampden Color & Chemical Co. based on the 1950 Sanborn map. Hampden Paint Chemical Co. was located between the existing and former railroad tracks and had a pond located on the northern most portion of the property in the 1886 Sanborn map. Two gasoline underground tanks (USTs) are shown in the 1886 Sanborn map as having been located to the south of the pond. The gasoline USTs and pond are not present in any of the Sanborn maps after 1886. Operations conducted on the property appear to have been conducted indoors and primarily consisted of storage and mixing of paints.

Regulatory Review:

A review of standard state and federal environmental record sources pertaining to the Site and surrounding area was conducted using the ERIS database service. The ERIS report was issued on August 7, 2020, using the minimum search distances recommended in the ASTM Standard. The local regulatory review included requesting information from the Springfield Fire Department and the Springfield Health and Human Services Department. The findings of the regulatory database review and the local records are summarized below. All of the below-listed databases were searched. The complete ERIS report, which includes descriptions of the databases searched and dates the databases were issued, is in Appendix B.

Site: The Site was not identified in the federal or state databases reviewed. The Site was however identified twice in the additional environmental records hazardous material information reporting system (HMIRS) database. Based on the listing, a vehicle attempted to drive around a cargo trailer at the intersection of Armory Street and Albany Street. While attempting to do so the vehicle hit the cargo trailer, bending the aluminum loading/unloading lines. The cargo trailer had just emptied its load at a delivery and there was no release. The lines were not punctured but were dislocated a few inches. The accident occurred on February 25, 2012, and report I-2012040146 was assigned. No release tracking number was issued, and no release was reported.

Summary: Information reviewed does not indicate that any oil and/or hazardous material was released; therefore, the accident is not expected to have impacted the boundary of the Site.

According to the Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Site Cleanup Phase I Site Assessment Map, the Site is located in a medium yield non-potential drinking water area. A copy of the map is included in Appendix C.

Adjacent Properties: Six of the abutting properties were identified in the state databases reviewed, four abutting properties were identified in the federal database reviewed, and three abutting property were identified in the additional environmental databases reviewed as discussed below.

Releases of OHM identified within the ASTM specified distance from the Site, but not directly abutting the Site, are not expected to significantly impact subsurface conditions at the Site, based on their location with respect to the Site, nature of the associated release(s), regulatory status, and/or distance from the Site. These listings can be found in the ERIS report presented in Appendix B.

229 Armory Street: This property is shown in the ERIS Database report as abutting the Site to the north and was identified in the Historic SPILLS database as discussed below.

- Spill ID W90-0718: MassDEP was notified of a release of petroleum from a tanker truck. The date of the release was not provided; however, releases listed in the Historic SPILLs database occurred prior to October 1, 1993. This listing is currently identified as Closed.

  Summary: Based on the status of this release and date (prior to 1993) of the release, it is likely any petroleum contaminants from this release have degraded over time and do not pose a significant risk within the Site work area.

225 Armory Street: This eastern abutting property, also identified as 190 Armory Street and 195-225 Armory Street, was identified in the Historic SPILLS, activity and use limitation (AUL), oil spill program (SPILLS), waste site cleanup notification/reportable release (RELEASE), tank related leaks and spills (LST), Resource Conservation and Recovery Act (RCRA) Non-Generator, leaking underground storage tank (LUST), leaking aboveground storage tank (LAST), and underground storage tank (UST) databases as discussed below.

- Release Tracking Number (RTN) 1-0000270: Historic petroleum contamination was identified on this property in 1986 and reported to MassDEP on May 28, 1987. Remedial measures were conducted between 1986 and 2005 to address several discrete areas of soil contamination but did not successfully reduce contamination in groundwater. A high-vacuum dual-phase extraction system was installed in 2005 and was in operation until 2010, at which time hydrocarbon concentrations in groundwater had been reduced to less than the applicable Method 1 Standards. A Class A-3 Response Action Outcome (RAO) was submitted to MassDEP on March 5, 2013, indicating a Permanent Solution has been achieved. Contamination had not been reduced to background, and an Activity and Use Limitation (AUL) was implemented. The AUL-restricted area is defined by the entire parcel, with the exception that the disposal site boundary diverges from the eastern property bound to encompass an off-site monitoring well. The AUL-restricted area is shown on Figure 2.

- RTN 1-0020153: MassDEP was notified of a two-hour reportable condition on December 26, 2016 when a leak was detected from a diesel fuel additive tank. A Permanent Solution with Conditions was submitted to MassDEP on October 18, 2019, indicating a Permanent Solution has been achieved, contamination has not been reduced to background, and an AUL has been implemented. The AUL assigned to RTN 1-0020153 exists independent of the prior AUL recorded for RTN 1-0000270 although both AULs encompass the entire parcel boundary. The AUL-restricted area is shown of Figure 2.

- RTN 1-0017102: MassDEP was notified of a two-hour reportable condition on August 8, 2008 when stained trap rock was observed under the drawdown valve of an AST during a routine inspection.

Remedial activities were conducted under an Immediate Response Action (IRA). Groundwater was reportedly not impacted. A Class A-2 RAO, indicating a Permanent Solution had been achieved without restriction, was submitted on December 6, 2008.

- RCRA Non-Gen: This property was identified in the RCRA Non-Generator database which indicates that the facility previously generated hazardous waste but does not presently generate waste. EPA ID MA5000003129 was assigned to the waste generator. No violations were recorded.

- UST Database: The following USTs were identified as having been removed from this property:

Tank Size (Gallons)	Tank Content	Date Installed	Date Removed
2,000	Gasoline	12/18/1973	5/29/1987
1,000	Waste Oil	12/19/1963	5/29/1987
1,000	Unregulated Content	12/18/1973	5/29/1987
15,000	Unregulated Content	12/19/1963	5/29/1987
4,000	Diesel	12/19/1963	5/29/1987
17,000	Waste Oil	12/19/1963	5/29/1987
275	Unregulated Content	12/18/1956	5/29/1987
275	Unregulated Content	12/19/1963	1/1/1975
1,000	Waste Oil	12/19/1963	5/29/1987

Summary: Petroleum impacted soil and/or urban fill may be encountered if excavation work is conducted within the vicinity of this parcel boundary or AUL areas. If subsurface work is proposed, the Licensed Site Professional (LSP) managing the AULs should be consulted prior to commencement of work. Should excavation, earthwork, or soil transportation be required, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

45 Albany Street (Joseph Freedman Property): This eastern abutting property, also identified as 40 Albany Street and 47 Albany Street, was identified in RELEASE, SPILLS, LST, LUST and RCRA Generator databases as discussed below.

- RTN 1-0016247: MassDEP was notified on June 28, 2006 of a release of 50 gallons of gasoline. Groundwater was reportedly not impacted. A Class A-1 RAO was submitted to MassDEP on October 20, 2006, indicating a Permanent Solution has been achieved and that the contamination has been reduced to background.

- RTN 1-0019796: MassDEP assigned RTN 1-20019796 on September 2, 2015 when they were notified of 0.80 feet of light non-aqueous phase liquid (LNAPL) discovered in a monitoring well. Remedial activities including LNAPL recovery are currently being conducted. The release is currently being remediated under a Phase II and IRA.

- RTN 1-0019844: MassDEP was notified on November 3, 2015 of a 120-day reportable condition due to the detection of petroleum impacted soil from a leaking pipeline. A Permanent Solution Statement with No Conditions was submitted to MassDEP on November 1, 2016, indicating a level of No Significant Risk and that the property was suitable for unrestricted future use.

- RTN 1-0013294: MassDEP was notified on January 28, 2000 of a release of approximately 100 to 200 gallons of hydraulic oil from a metal shredder. The release was limited to a concrete paved surface and a limited amount of impact to soil beneath the shredder. Groundwater was reportedly not impacted. A Class A-2 RAO was submitted to MassDEP on January 8, 2001, indicating a Permanent Solution has been achieved without restriction.

- RCRA Generator: This facility was identified twice in the RCRA conditionally exempt small quantity generator (CESQG) database and once in the RCRA small quantity generator database with EPA IDs MAC300003449, MAD981206774, and MAR000518589. A CESQG indicates the generator generates less than 100 kilograms (kg) of hazardous waste per month and an SQG indicates that the facility generates less than 1000 kg of hazardous waste per month but more than 100 kg of hazardous waste per month. Several violations have been reported for the CESQGs. All violations have achieved compliance, except for violations dated May 2020. No violations were reported for the SQG. No additional information regarding the violation was noted.

Summary: Although releases have occurred on this property, the releases did not occur within the boundary of the proposed Site work. However, urban fill was observed while conducting subsurface investigations on this property and is likely present within the project boundary. Should work occur within the boundary of this parcel, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

140 Armory Street (Sunoco): This western abutting property, also identified as 487 Taylor Street, was identified in the UST, Historic LUST, LUST, RELEASE, RCRA Non-Generator, LST, SPILLS, Delisted LST, and Brownfields databases as discussed below:

- Spill ID W93-0301 MassDEP was notified of a release of gasoline from a UST. The date of the release was not provided; however, releases listed in the Historic SPILLs database occurred prior to October 1, 1993. The release reportedly only impacted soil. This listing is currently identified as Closed.

- RTN 1-0000176: On January 16, 1987, this property was listed as a Location to be Investigated based on the discovery of LNAPL in the bottom of an excavation during the removal of a 10,000-gallon gasoline UST. Approximately 350 cubic yards of petroleum impacted soil was excavated and removed from this property. MassDEP was notified on February 5, 1987, and RTN 1-0000176 was assigned. On March 10, 1987 MassDEP was notified that one of the newly installed USTs was taking on water and approximately 800-gallons of product has been released. A Release Abatement Measure (RAM) Plan was submitted to MassDEP on October 28, 1993 and included the removal of approximately 386 tons of impacted soil and upgrading the USTs and system piping. A Class A-2 RAO was submitted to MassDEP on November 7, 1996, indicating a Permanent Solution had been achieved without restriction. No reportable concentrations were detected in the monitoring wells (MW-3, MW-4A, and MW-7) installed closest to the proposed Site work area (Armory Street).

- RTN 1-0015517: MassDEP was notified on October 19, 2004 of a 120-day reportable condition due to the detection of C_5-C_8 aliphatics and C_9-C_{12} aliphatics in existing groundwater monitoring wells. A Class B-1 RAO was submitted to MassDEP on December 5, 2005, indicating remedial actions have not been

conducted because a level of No Significant Risk exists. Trace concentrations of C_5-C_8 aliphatics, C_9-C_{12} aliphatics, C_9-C_{10} aromatics and methyl tert-butyl ether (MTBE) were detected in monitoring well MW-7, located closest to the proposed Site work area (Armory Street).

- RTN 1-0020318: MassDEP was notified of a two-hour reportable condition on August 2, 2017. Remedial assessment under an IRA is reportedly under way. According to the ERIS Database report, the listing is identified as unclassified, indicating the release has not reach its Tier Classification deadline. No additional information was provided, and no documents were available for review on MassDEP's online database.

- RCRA Non-Gen: This property was identified in the RCRA Non-Generator database which indicates that the facility previously generated hazardous waste but does not presently generate waste. EPA ID MA5000000216 was assigned to the waste generator. No violations were recorded.

- UST Database: The following USTs were identified in the UST database as discussed below:

Tank Size (Gallons)	Tank Content	Date Installed	Date Removed	Tank Status
8,000	Diesel	3/15/1987	8/3/2017	Removed
8,000	Gasoline	3/15/1987	8/3/2017	Removed
12,000	Gasoline	11/21/2017	-	In Use
10,000	Gasoline	5/3/1979	2/1/1987	Removed
10,000	Gasoline	3/15/1987	8/3/2019	Removed
8,000	Gasoline	11/21/2017	-	In Use
10,000	Gasoline	5/3/1979	2/1/1987	Removed
12,000	Gasoline	11/21/2017	-	In Use
10,000	Gasoline	5/3/1979	2/1/1987	Removed
8,000	Diesel	11/21/2017	-	In Use

Summary: Several releases have occurred on this property, including one recent release that is currently unclassified. Although the other releases have reached regulatory closure, and groundwater concentrations detected in monitoring wells closest to the proposed Site work area have not exceeded the applicable standards, based on the historical and present use of this parcel of land, petroleum impacts maybe encountered if work is done along this parcel boundary. Should work occur within the boundary of this parcel, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

145 Armory Street (Springfield Terminals & Noonan Energy Corp.): This eastern abutting property was identified in the SPILLS, RELEASE, AST and UST database as discussed below.

- RTN 1-0016476: MassDEP was notified on January 1, 2007 when approximately 3,000 gallons of #2 fuel oil was released as a result of a line failure. Approximately 469 tons of petroleum impacted soil was excavated from this property and disposed of off-site under an IRA Plan. The release occurred on the northeastern most portion of this property, closest to the former railroad right-of-way. A Class A-2 RAO

was submitted to MassDEP on September 25, 2009, indicating a permanent solution was achieved without restriction.

- AST Database: This property was identified in the AST database as having an AST Use Permit for the gross storage of 508,200 gallons. The permit expired on November 9, 2007 and the last inspection date is listed as November 9, 2006. No additional information was provided.

- UST Database: The following USTs were identified in the UST database as discussed below:

Tank Size (Gallons)	Tank Content	Date Installed	Date Removed	Tank Status
20,000	Unregulated Content	-	9/15/1988	Removed
20,000	Unregulated Content	-	9/15/1988	Removed
1,000	Gasoline	-	9/15/1988	Removed
20,000	Unregulated Content	-	9/15/1988	Removed

Summary: Although the historic release identified in connection with this property has achieved regulatory closure, and the release did not occur in the area of the proposed Site work, past use of the property as a coal yard and fuel storage terminal suggests it may be a source of oil and/or hazardous material (OHM) and should be noted in the contractor's HASPs and SMPs. Should work occur within the boundary of this parcel, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

83-85 Warwick Street (No Location Aid & Northeast Parking Lot): This western abutting property was identified in the RELEASE, AUL, and Brownfields databases as discussed below.

- RTN 1-0017624: MassDEP was notified on October 16, 2009 when subsurface fill material impacted with petroleum hydrocarbons, metals, and polychlorinated biphenyls (PCBs) was discovered. The source and placement of the fill material is unknown. Approximately 584 cubic yards of impacted soil was excavated and managed on-site under a RAM Plan. Impacted soils have been isolated below a geotextile marker layer with at least 2 feet of clean fill and covered by asphalt pavement. A Class A-3 RAO was submitted to MassDEP on July 2, 2013, indicating a Permanent Solution has been achieved; however, contamination had not been reduced to background and an AUL was implemented. The AUL-restricted area is shown of Figure 2.

  Summary: Petroleum hydrocarbons, metals, and PCB impacted soil may be encountered if excavation work is conducted within the vicinity of this parcel boundary/AUL area. If subsurface work is proposed, the LSP managing the AUL should be consulted prior to commencement of work. Should excavation, earthwork, or soil transportation be required, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

450 Taylor Street (Taylor Street Lot 8 & Moses Ehrich Iron & Metal Co.): This western abutting property was identified in the AUL, Brownfields, Comprehensive Environmental Response, Compensation, and Liability Information System (CERLIS), CERLIS Further Remedial Action Planned (NFRAP) CERLIS NFRAP, RELEASE, and Superfund Enterprise Management System (SEMS) Archive databases as discussed below.

- RTN 1-0000208: This property was classified as a Priority Site under the original Massachusetts Contingency Plan (MCP) in 1986. The property was transitioned to a Tier 1A site in 1995 when the new MCP was issued. The primary concentrations of concern on this property include PCBs, lead, beryllium, and petroleum hydrocarbons. The source of the residuals in soil have been attributed to the historic uses of this property and former UST. PCBs and metals have also been detected in groundwater on this property; however, the contaminants in groundwater were thought by the LSP to be attributed to suspended sediment collected in the samples. A Class A-3 RAO was submitted to MassDEP on September 19, 2002, indicating a Permanent Solution has been achieved, contamination had not been reduced to background, and an AUL was implemented. The AUL-restricted area is shown of Figure 2.

  Summary: PCBs, lead, beryllium, and petroleum hydrocarbon impacted soil may be encountered if excavation work is conducted within the vicinity of this parcel boundary/AUL area. If subsurface work is proposed, the LSP managing the AUL should be consulted prior to commencement of work. Should excavation, earthwork, or soil transportation be required, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

Local Research:

MassDEPs Underground Storage Tank Facility Search

The following surrounding properties were identified on MassDEPs UST online database:

Location	Tank Size (gallons)	Tank Content	Tank Type	Date Installed	Date Removed
101 Armory Street	10,000	Gasoline	UST	-	6/1/1979
	10,000	Gasoline	UST	-	6/1/1979
	1,000	Gasoline	UST	4/27/1961	6/1/1979
	1,000	Gasoline	UST	4/27/1961	6/1/1979
140 Armory Street	12,000/8,000	Gasoline/Diesel	UST	11/21/2017	-
	12,000/8,000	Gasoline/Gasoline	UST	11/21/2017	-
	8,000	Diesel	UST	3/15/1987	8/3/2017
	8,000	Gasoline	UST	3/15/1987	8/3/2017
	10,000	Gasoline	UST	3/15/1987	8/3/2017
	10,000	Gasoline	UST	5/3/1979	2/1/1987
	10,000	Gasoline	UST	5/3/1979	2/1/1987
	10,000	Gasoline	UST	5/3/1979	2/1/1987
145 Armory Street	1,000	Gasoline	UST	-	9/15/1988
	20,000	Unregulated Content	UST	-	9/15/1988
	20,000	Unregulated Content	UST	-	9/15/1988
	20,000	Unregulated Content	UST	-	9/15/1988
225 Armory Street	15,000	Unregulated Content	UST	12/19/1963	5/29/1987
	275	Unregulated Content	UST	12/19/1963	1/1/1975

	275	Unregulated Content	UST	12/18/1956	5/29/1987
	1,000	Unregulated Content	UST	12/18/1973	5/29/1987
	1,000	Waste Oil	UST	12/19/1963	5/29/1987
	1,000	Waste Oil	UST	12/19/1963	5/29/1987
	2,000	Gasoline	UST	12/18/1973	5/29/1987
	8,000	Gasoline	UST	12/18/1973	5/29/1987
	4,000	Diesel	UST	12/19/1963	5/29/1987
	17,000	Waste Oil	UST	12/19/1963	5/29/1987

Springfield Fire Department

Tetra Tech personnel requested information from the City of Springfield's Fire Department on August 5, 2020 pertaining to the use, storage, or release of oil and/or hazardous materials at the Site and abutting properties. As of the date of this report, the Springfield Fire Department has not responded.

Springfield Health and Human Services Department

Tetra Tech personnel requested information from the City of Springfield Health and Human Services Department on August 5, 2020 pertaining to the use, storage, or release of oil and/or hazardous materials at the Site and abutting properties. As of the date of this report the Springfield Health and Human Services Department has not responded.

Previous Investigation Conducted within Site Project Limits:

Seaboard Drilling, Inc. conducted a subsurface investigation within the Site limits under the direction of NOBIS Group in the Spring of 2019. The investigation included the advancement of twelve borings and three test pits. Urban fill was reportedly encountered in all boring and test pit locations beneath topsoil, asphalt, and concrete sidewalks. According to NOBIS Group's Preliminary Geotechnical Report dated November 20, 2019, the urban fill material appeared to have been used to construct the approach embankments, with fill increasing in depth leading up to the bridge abutments. Debris observed in the urban fill layer consisted of glass, asphalt, plastic, coal ash, and brick. NOBIS Group noted old foundations, railroad ties and other building debris may be encountered in the urban fill layer. A petroleum or kerosene odor was noted while drilling in the vicinity of the northern bridge abutment over the CSX Mainline at a depth of 30 to 36 feet below ground surface.

Urban fill was observed while conducting the subsurface investigation within the project limits of the Site. Therefore, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. Should excavation, earthwork, or soil transportation be required in these areas, we recommend preparing a SMP and HASP that anticipates health and safety issues related to urban fill. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

Summary and Conclusions:

We have conducted an environmental review for the Armory Street corridor between the Genesee Street/Warwick Street/Armory Street intersection and the Taylor Street/Armory Street intersection. Our findings are as follows:

- The Site was identified in the additional environmental records hazardous material information reporting system (HMIRS) database. Based on the listing, a vehicle attempted to drive around a cargo trailer at the intersection of Armory Street and Albany Street. While attempting to do so, the vehicle hit the cargo trailer, bending the aluminum loading/unloading lines. The cargo trailer had just emptied its load at a delivery and there was no release. The lines were not punctured but were dislocated a few inches. The

accident occurred on February 25, 2012, and report I-2012040146 was assigned. No release tracking number was issued, and no release was reported. Information reviewed regarding this listing indicate a release did not occur. Therefore, this accident is not expected to impact the proposed Site work area.

- According to the MassDEP Bureau of Waste Site Cleanup Phase I Site Assessment Map, the Site is located in a medium yield non-potential drinking water area. A copy of the map is included in Appendix C.

- The eastern abutting property (225 Armory Street) was identified in the state, federal, and additional environmental records databases due to several releases. Petroleum impacted soil and urban fill may be encountered if excavation work is conducted within the vicinity of the parcel boundary. Two AULs currently encompass the entire parcel boundary of this property. If subsurface work is proposed within this parcel's limits, the LSP managing the AULs should be consulted prior to commencement of work. Should excavation, earthwork, or soil transportation be required, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

- The southern abutting property (140 Armory Street) was identified in the state and federal databases due to several releases. Although all but one release has reach regulatory closure and groundwater concentration detected in monitoring wells closest to the proposed Site work area have not exceeded the applicable standards, petroleum impacts maybe encountered if work is done along this parcel boundary due to the current and historic use of the property as a gasoline service station. Should work occur within the boundary of this parcel, this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

- The western abutting property (83-85 Warwick Street) was identified in the state database due to the discovery of petroleum hydrocarbons, metals, and PCB impacted soil. An AUL has been implemented on this property to achieve regulatory closure. Petroleum hydrocarbons, metals, and PCB impacted soil may be encountered if excavation work is conducted within the vicinity of this parcel boundary/AUL area. If subsurface work is proposed, the LSP managing the AUL should be consulted prior to commencement of work. Should excavation, earthwork, or soil transportation be required this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

- The eastern abutting property (145 Armory Street) was identified in the state database due to the release of #2 fuel oil. Although the historic release identified at this property has achieved regulatory closure and the release did not occur in the area of the proposed Site work, past use of the property as a coal yard and fuel storage terminal suggests it may be a source of OHM and should be noted in the contractor's HASPs and SMPs. Should work occur within the boundary of this parcel this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

- The western abutting property (450 Armory Street) was identified in the state and federal databases due to the detection of PCBs, lead, beryllium and petroleum hydrocarbons. An AUL has been implemented on this property to achieve regulatory closure. PCBs, lead, beryllium, and petroleum hydrocarbons impacted soil may be encountered if excavation work is conducted within the vicinity of this parcel boundary/AUL

area. If subsurface work is proposed, the LSP managing the AUL should be consulted prior to commencement of work. Should excavation, earthwork, or soil transportation be required this information should be taken into consideration by any contractor developing HASPs and SMPs for workers in this area. If excess soil is to be removed for construction purposes, any treatment or off-site disposal must be managed in accordance with applicable regulations.

- In addition to the known releases of OHM on adjoining properties, transportation corridors have generally been known to have low levels of organics and metals present in relation to roadway usage and maintenance. Should excavation, earthwork, or soil transportation be required at the proposed Site work area, we recommend preparing a SMP that anticipates health and safety issues and potential off-site disposal, if warranted.

- Based on review of a previous subsurface investigation conducted within the Site project limits, urban fill appears to have been used to construct the approach embankments, with fill increasing in depth leading up to the bridge abutments. Should excavation, earthwork, or soil transportation be required in these areas, we recommend preparing a SMP and HASP that anticipates health and safety issues related to urban fill and potential off-site disposal, if warranted.

- Based on review of adjoining properties, urban fill has been identified on most of the abutting properties. Should excavation, earthwork, or soil transportation be required at the proposed Site work area, we recommend preparing a SMP that anticipates health and safety issues and potential off-site disposal, if warranted.

- We recommend that information regarding all environmental conditions at the Site be considered by the qualified environmental professional(s) preparing HASPs and SMPs for contractors working in these areas.

Attachments

Figure 1 –Site Locus Map
Figure 2 –Site and Adjoining Properties

Appendix A – Limitations
Appendix B – ERIS Database Report, Aerial Photographs, Sanborn Fire Insurance Maps
Appendix C – MassDEP – Bureau of Waste Site Cleanup Phase I Site Assessment Map

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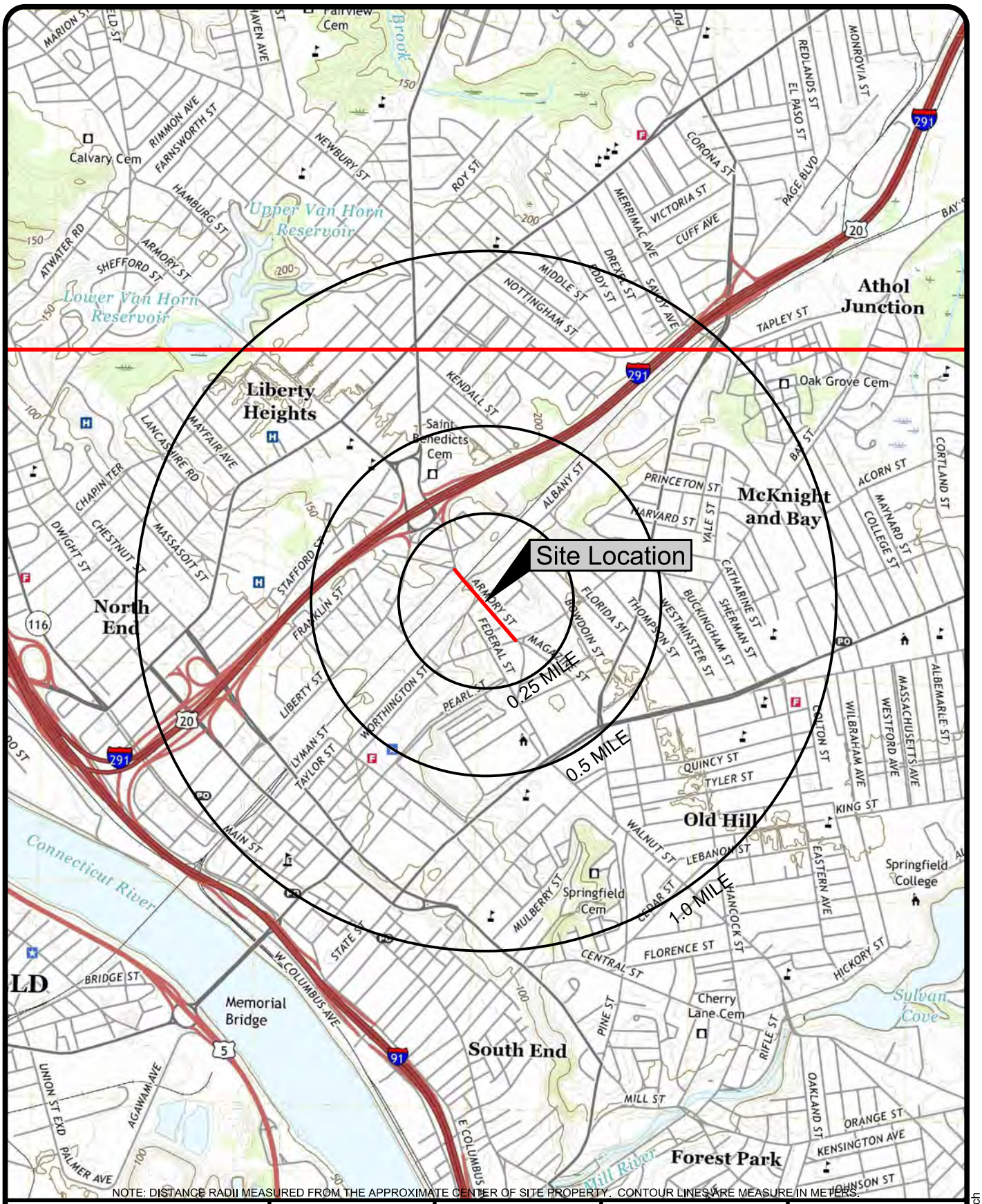

NOTE: DISTANCE RADII MEASURED FROM THE APPROXIMATE CENTER OF SITE PROPERTY. CONTOUR LINES ARE MEASURE IN METERS.

TETRA TECH
www.tetratech.com
100 Nickerson Road
Marlborough, Massachusetts 01752
Phone: (508) 786-2200 Fax: (508) 786-2201

N

0' 2000'

Information obtained from USGS Map of Springfield South Quadrangle dated 2018

MassDOT

Armory Street
Springfield, Massachusetts

Site Locus Map

Project No.:	143-4522-14001.21
Date:	August 5, 2020
Designed By:	KML
Figure	1

Bar Measures 1 inch

Copyright: Tetra Tech

8/5/2020 3:11:31 PM - P:\4522\143-4522-14001\ASSIGN NO 21 - SPRINGFIELD BRIDGES\CAD\HAZMAT CAD\N-ZZ FIGURE 1 SITE LOCUS MAP.DWG - LEBLANC, KAITLYNE

Date: 8/11/2020
Path: C:\Users\kaitlyne.cullinane\Desktop\GIS\Springfield\Figure 2 Site and Adjacent Properties.mxd

Legend
- Site
- Adjoining Properties
- Approximate AUL Resticted Areas

Notes:
1. Aerial Source: MassGIS USGS Color Ortho Imagery March 24, 2019 - April 25, 2019.
2. Property Boundary Source: Approximate boundaries based on the State of Massachusetts GIS online database of Level 3 Assessor's Parcels for Springfield, MA.

0 80 160
Feet
1 inch = 160 feet

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MassDOT

Armory Street over CSX Mainline & CSX Abandoned
Springfield, Massachusetts

Site and Adjacent Properties

Project No.:	143-4522-14001.21
Date:	August 11, 2020
Designed By:	KML
Figure:	2

DOCUMENT A00882

PRE-DEMOLITION HAZMAT SURVEY AT 176 ARMORY STREET

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To: **Anthony Christakis**

From: **James M. Smith, Supervisor, Hazardous Materials Review** JMS

Date: **October 15, 2025**

Subject: **Springfield – Bridge Replacement, S-24-016, Armory Street Over CSX Mainline & S-24-026, Armory Street Over Abandoned CSX**
Project #609409 PS&E Submission

SUMMARY

The referenced project was reviewed to evaluate the potential for oil and hazardous material impacts to the proposed work. Information regarding the proposed work was obtained from the PS&E submission by Tetra Tech, Inc.

Planned work consists of the replacement of Bridges S-24-016, Armory Street over New York Lines Railroad (CSX), and S-24-026, Armory Street Over Abandoned Railroad. The project also involves the reconstruction and widening of a portion of Armory Street, including the construction of retaining walls and a shared-use path, replacement and alterations to traffic signals, guardrail replacement, and other related work.

Soil Management Quantities

Conversion of soil from CY to tons is generally 1 CY to 1.5 tons (give or take a bit based on soil composition). In the PSE Calculation Book, the designer's conversion of soil from CY to tons in the 181 items appears to be converted in the opposite direction (1.5 CY to 1 ton). For Item 181.11, the calculation shows 1,307 CY = 968.2 tons, for a conversion rate of 1.35 CY to 1 ton. The designer should review the CY/ton conversions for soils associated with all four 181 items, as they all appear to be converting CY to tons in the same manner.

Building Demolition

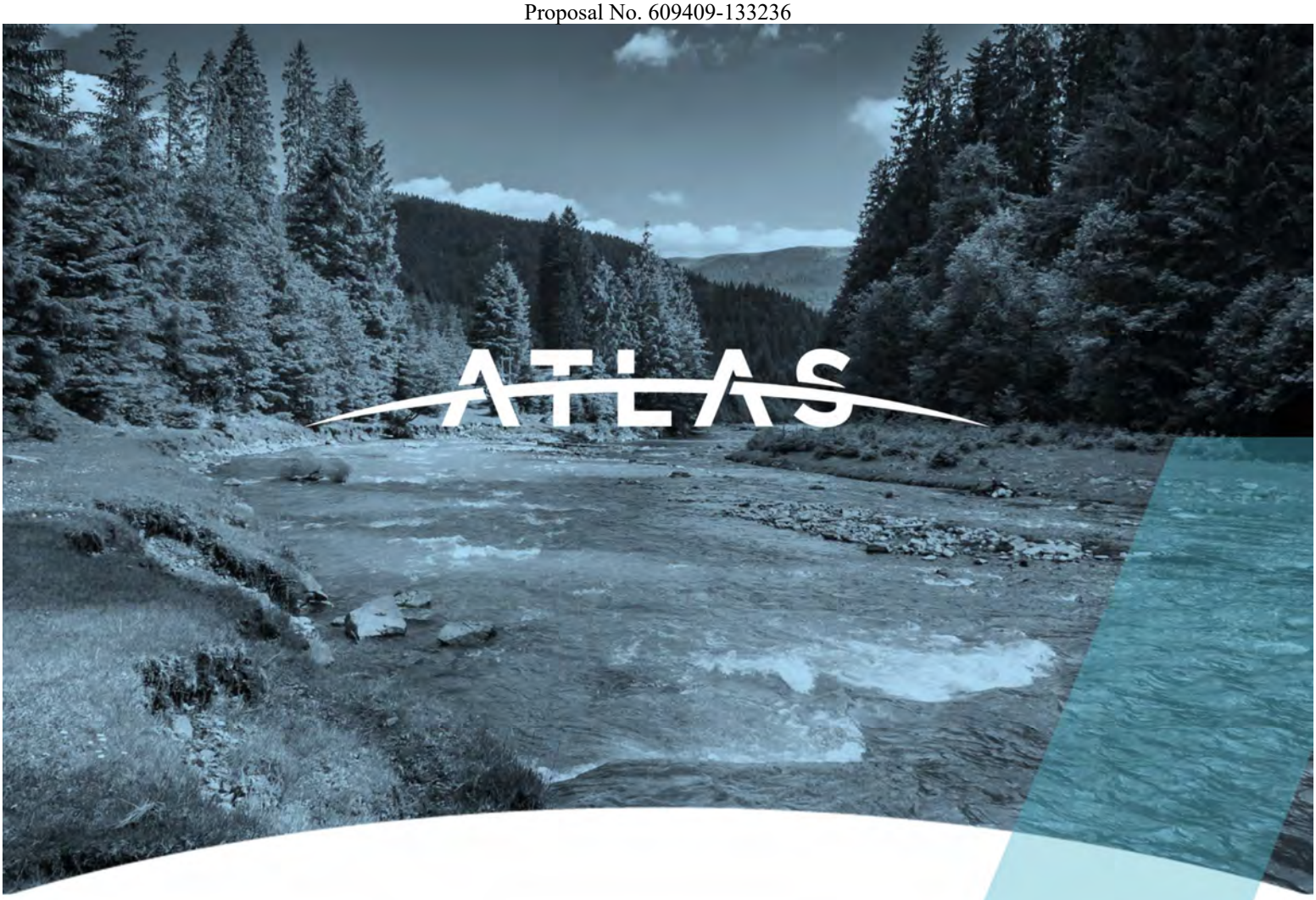
A pre-demolition hazardous materials survey of the building has been completed. A report of the findings is being prepared, and is expected by 10/17/25. Once received, a copy of this report will be provided to the PM for Designer information, and **shall be included in the bid documents**.

Any special provisions recommended for this project are considered standard and, as such, should not be modified without prior written approval from Environmental Services.

The Hazardous Materials Review Unit will not clear this project for hazardous materials-related concerns until confirmation of satisfactory inclusion of all requested items (i.e., updated submission including revised design documents) has been received.

This memorandum has been uploaded to ProjectInfo. Should you have any questions regarding the content of this memorandum please contact James Smith at james.m.smith@dot.state.ma.us.

JMS



HAZARDOUS BUILDING MATERIALS INSPECTION REPORT

DISTRICT 2 – FORMER JOSEPH FREEDMAN COMPANY
176 ARMORY STREET
SPRINGFIELD, MASSACHUSETTS 01105

PREPARED FOR:

Mr. Gregory Fulgione
Senior Environmental Coordinator
Massachusetts Department of Transportation
251 Faunce Corner Road
North Dartmouth, Massachusetts 02747

PREPARED BY:

Atlas Technical Consultants LLC
10 State Street, Suite 100
Woburn, Massachusetts 01801

October 17, 2025

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APPENDICES

Appendix A Asbestos Bulk Sample Analysis Results By PLM
Appendix B Lead Paint Chip Analysis Report
Appendix C PCB Analysis Report

1.0 EXECUTIVE SUMMARY

Atlas Technical Consultants, LLC (Atlas) was retained by the Massachusetts Department of Transportation to perform a hazardous building materials survey to support the demolition and removal of the District 2 Former Joseph Freedman Company, located at 176 Armory Street, Springfield, Massachusetts. Atlas understands that the building is scheduled to be demolished. The inspection was performed in accordance with Atlas Proposal 25-06444, dated August 12, 2025.

Atlas's scope of work included a survey for asbestos containing materials (ACM), lead containing paints and PCB materials throughout the building.

1.1 ASBESTOS

Section 2.0 discusses the ACM survey and sampling methodology. This survey involved a visual inspection and collection of the suspect building materials. In consideration that the building is scheduled for demolition and was not occupied, Atlas performed exploratory demolition to identify hidden ACMs.

The asbestos survey was performed by Massachusetts Division of Labor Standards (DLS) certified Asbestos Inspector, Mr. Michael Puyana (AI-061157), on September 2, 2025. A total of sixty-one (61) samples of suspect ACM were collected, with thirteen (13) analyzed to determine asbestos content. The Atlas inspector performed both the visual inspection and bulk sampling in the building according to methods outlined in the U.S. Environmental Protection Agency (EPA) guidance document titled, "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Document No. 560/5-85/024). Please find the Asbestos Identification Laboratory (AIL) Polarized Light Microscopy (PLM) bulk sample results included as Appendix A.

1.2 LEAD DETERMINATION

Atlas performed a representative determination on representative locations of the building. The lead paint testing was performed by collecting paint chip samples. Paint chip samples were submitted to Pace Analytical Laboratory, (Pace) for analysis in accordance with EPA method SW846—3050B/7000B. Pace is an AIHA-LAP Certified Laboratory with lab ID number: 102754.

Results of the lead determination indicated that locations throughout the exterior of the building which will be impacted by the upcoming project were found to contain detectable levels of lead. Table 2, found in Section 3.2 presents the findings of Atlas's lead determination.

1.3 PCBS IN ING MATERIALS

Atlas performed a visual representative survey of door caulk on the exterior of the building. The building is currently scheduled for demolition and was vacant at the time of the inspection. The survey was performed by Mr. Ricardo Nunes, Atlas Inspector on September 2, 2025. Accessible sealants such as door caulking was sampled and submitted to a laboratory for PCB analysis using Soxhlet extraction and EPA analytical Method 8082.

The results of PCB sealant survey are provided in Section 4.0. PCBs were detected in the material identified by Atlas, at a maximum of 4.6 ppm. This material is defined as Excluded PCB Product under TSCA. Materials classified as Excluded PCB Products maybe managed by any permitted waste management facility as long as the facility is made aware at the material being sent to them contains PCBs and their permit allows them to accept these types of materials. Many solid waste and recycling facilities can not accept materials that contain $\geq$ 2 ppm PCBs. Costs for removal and disposal of building materials that are considered Excluded PCB Products, but are not ACM, vary significantly by facility, and could range up to 20% above the standard costs for disposal of demolition debris containing sealant materials.

Limitations

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the field of environmental science and engineering. This statement is in lieu of other statements either expressed or implied. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

Environmental evaluations are limited in the sense that conclusions and recommendations are developed and information obtained from limited research and secondary sources. Except as set forth in this report, Atlas has made no independent investigations as to the accuracy or completeness of the information derived from the secondary sources and personal interviews and has presumed that such information was accurate and complete.

This report is intended for the sole use of Massachusetts Department of Transportation. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations, is at risk of said user.

CERTIFICATION OF RESULTS

This report has been prepared for the exclusive use of Massachusetts Department of Transportation. Photocopying of this document by parties other than those designated by the Client, or use of this document for purposes other than it is intended, is prohibited.

Respectfully submitted this 17th day of October, 2025.

Atlas Technical Consultants LLC

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2.0 ASBESTOS CONTAINING MATERIALS SURVEY

2.1 Sampling Methodology

The initial asbestos survey was performed by Massachusetts Division of Labor Standards (DLS) certified Asbestos Inspector, Mr. Michael Puyana (AI-061157), on September 2, 2025. Bulk samples, representing individual homogenous areas of suspect materials were collected in a randomly distributed manner, in accordance with the methods outlined below.

Building materials exist in the form of thermal systems insulation (TSI), surfacing materials, and miscellaneous materials.

The following generally illustrates the sampling strategy employed by Atlas where feasible:

(a) Surfacing materials - In a randomly distributed manner, collect bulk samples of surfacing materials, representative of each homogeneous area, and not assumed to be ACM.

(1) Collect at least three (3) bulk samples from each homogeneous area that is less than or equal to 1,000 ft^2.
(2) Collect at least five (5) bulk samples from each homogeneous area that is greater than 1,000 ft^2, but less than or equal to 5,000 ft^2.
(3) Collect at least seven (7) bulk samples from each homogeneous area that is greater than 5,000 ft^2.

(b) Thermal systems insulation.

(1) In a randomly distributed manner, collect at a minimum, three (3) bulk samples of thermal systems insulation material, representative of each homogeneous area, and not assumed to be ACM.
(2) Collect, at a minimum, one (1) bulk sample of patched thermal systems insulation, representative of each homogenous area, and not assumed to be ACM, providing the section of patch was less than 6 linear or square feet.
(3) Collect, at a minimum, three (3) representative bulk samples of each insulated mechanical system not assumed to be ACM, including, but not limited to cementitious material used on pipe fittings such as tees, elbows, or valves. Representative sampling was conducted in a manner sufficient as to identify whether each homogenous area is either asbestos or non-asbestos containing.
(4) Bulk samples are not required to be collected from any homogeneous area where the accredited asbestos inspector has determined that the thermal systems insulation is a non-suspect material (i.e., fiberglass, foam glass, rubber, or any other non-ACM).

(c) Miscellaneous materials - Collect, at a minimum, two (2) representative bulk samples of each miscellaneous material not assumed to be ACM, including, but not limited to ceiling tiles, floor tiles, associated floor tile mastic, roofing materials, waterproofing, etc. Representative sampling was conducted in a manner sufficient as to identify whether each homogenous area is either asbestos or non-asbestos containing.

2.2 Asbestos-Containing Materials

Atlas conducted the asbestos survey in areas associated with the upcoming demolition project of the Former Joseph Freeman Company building located at 176 Armory Street, Springfield, Massachusetts. This survey involved a visual inspection and collection of the suspect building materials. In consideration that the building is scheduled for demolition, Atlas performed exploratory demolition to identify hidden ACMs. Asbestos bulk sample analysis results are located in Appendix A.

PLM Bulk sample analysis indicated that the following materials identified and sampled by Atlas were found to contain asbestos:

- Approximately 20 ln ft of asbestos-containing exterior door caulk,
- Approximately 3 sq ft of asbestos-containing roof vent pipe mastic,
- Approximately 200 sq ft of asbestos-containing black asphalt roof shingle,
- Approximately 200 sq ft of asbestos-containing black asphalt roof underlay,
- Approximately 1,250 sq ft of asbestos-containing black asphalt roof shingle-bottom layer,
- Approximately 1,250 sq ft of asbestos-containing black asphalt roof shingle-2nd layer,
- Approximately 30 sq ft of asbestos-containing multi-colored boiler corrugated insulation,
- Approximately 10 sq ft of asbestos-containing brown boiler side box insulation, and
- Approximately 30 sq ft of assumed asbestos-containing brown refractory insulation.

None of the other materials identified and sampled by Atlas were found to contain asbestos.

The following table presents a list of the identified, confirmed ACMs in the building. Note, ACM is identified by the MA DEP as any material or product containing one (1) percent or greater asbestos by weight.

Table 1 – Summary of Identified Asbestos-Containing Materials
Former Joseph Freeman Company Building
176 Armory Street
Springfield, Massachusetts

Location	Material	Estimated Quantity	Result
Exterior	Door Caulk	20 LF	3% Chrysotile
Roof	Black Vent Pipe Mastic	3 SF	10% Chrysotile
Gable End	Black Roof Shingle	200 SF	<1% Chrysotile
Gable End	Black Asphalt Underlay	200 SF	<1% Chrysotile
Roof	Black Asphalt Shingle – Bottom Layer	1,250 SF	<1% Chrysotile
Roof	Black Asphalt Shingle – 2nd Layer	1,250 SF	<1% Chrysotile
Boiler Room	Multi-colored Boiler Corrugated Insulation	30 SF	70% Chrysotile
Boiler Room	Brown Side Box Insulation	10 SF	5% Chrysotile
Boiler Room	Brown Refractory Insulation	15 SF	5% Chrysotile

MassDEP considers less than one or equal to 1% asbestos containing materials to be asbestos containing waste materials (ACWMs).

Table 2 – Cost Estimates for Identified Asbestos-Containing Materials
Former Joseph Freeman Company Building
176 Armory Street
Springfield, Massachusetts

Material	Estimated Quantity	Unit Cost	Total Estimated Cost
Exterior Door Caulk	20 ln ft	$10/ln ft	$200.00
Black Vent Pipe Mastic	3 sq ft	$100/ sq ft	$300.00
Black Roof Shingle and Underlay	200 sq ft	$20/ sq ft	$4,000.00
Black Asphalt Roof Shingle Bottom Layer and 2nd Layer	1,250 sq ft	$25/sq ft	$31,250.00
Multi-colored Boiler Corrugated Insulation	30 sq ft	$30/sq ft	$900.00
Brown Side Box Insulation	10 sq ft	$25/sq ft	$250.00
Brown Refractory Insulation	15 sq ft	$25/sq ft	$375.00
Total Estimated Cost for Removal of All Identified ACM:			$37,275.00

The following table lists the suspect materials identified that were sampled and determined to be non-ACM.

Table 3 – Summary of Non Asbestos-Containing Materials
Former Joseph Freeman Company
176 Armory Street
Springfield, Massachusetts

Material	Sample Location(s)
Ceiling Finish on Gypsum Board	Interior – Lower Level
Wall Paneling Mastic	Interior
Stucco Finish	Exterior Walls
Floor Tile under Carpet	Interior
Floor Tile Mastic under Carpet	Interior
Residual Cove Base Mastic	Interior – Hidden Paneling
Ceiling Tile Glue Daubs	Interior
1' x 1' Ceiling Tile	Interior
Window Glaze	Exterior
Gypsum Ceiling Board	Interior – Lower Level
Carpet Mastic	Interior
Window Glaze	Interior – Lower Level
CMU Block Mortar	Interior – Lower Level
Roof Paper Underlay	Interior – Lower Level
Asphalt Shingle – 3rd Layer	Roof
Asphalt Shingle – Top Layer	Roof

Internal Fire Brick	Boiler
Flue Cement	Boiler Area

2.3 Analytical Method

Samples were placed in labeled containers, which were sealed and submitted to the laboratory for analysis. Bulk samples of suspect materials were analyzed by Asbestos Identified Laboratory (AIL) of Woburn, Massachusetts, by means of the EPA-approved polarized light microscopy with dispersion staining (PLM/DS) method using the visual estimation technique for asbestos quantification. AIL is fully accredited for bulk sample analysis under the National Voluntary Laboratory Accreditation Program (NVLAP), administered by the National Institute of Standards and Technology, and is also licensed by the Massachusetts DLS (License Nos. AA-000208). Bulk samples were analyzed for asbestos content using EPA Method 600/R-93/116. The visual estimation technique was used to quantify asbestos concentrations. The PLM/DS analytical method is modeled after 40 CFR Part 763, Subpart F, Appendix A: "Interim Method for the Determination of Asbestos in Bulk Insulation Samples." If a material contains 1% asbestos or greater, it is considered to be asbestos-containing material. Upon client request, or at the recommendation of the analyst, the 'Point Counting Method' may be used to verify the presence/absence of asbestos when a sample contains less than 10% asbestos by visual estimate.

2.4 Consideration for Hidden Materials

Atlas conducted the asbestos survey in areas associated with the upcoming demolition project of the Former Joseph Freeman Company building located at 176 Armory Street, Springfield, Massachusetts. This survey involved a visual inspection and collection of the suspect building materials. In consideration that the building is scheduled for demolition and was not occupied, Atlas performed exploratory demolition to identify hidden ACMs.

Atlas recommends if a suspect material has not been positively identified, but is similar in mode of occurrence or physical properties as other identified ACM, it should be considered asbestos containing. Only through further sampling and analysis should a suspect material be identified as non-asbestos.

2.5 Recommendations

Atlas understands that demolition activities are planned for this project. All identified ACM that will be impacted by the planned demolition project should be properly removed and disposed of by a Commonwealth of Massachusetts licensed Asbestos Contractor prior to disturbance.

Atlas recommends that precautions be taken to prevent unauthorized disturbance of identified ACM in this report.

Atlas also recommends the following as part of the abatement process:

- Although the asbestos contractor is required to follow the requirements outlined in Federal, Massachusetts State, and local regulations regarding asbestos during any abatement project, Atlas recommends the development of a project specification and the use of project oversight to ensure compliance with all applicable regulations as well as protect the interest of the client for all abatement work performed at the Site. The project specification shall reference the regulations pertinent to the project, including those work procedures that shall be followed by asbestos abatement personnel.

- As part of each abatement contractor bidding process, a unit price schedule for the abatement of asbestos-containing materials should be established. The unit price schedule

should include costs for those materials identified within this report, as well as those materials that may potentially be uncovered during renovation/demolition activities. Included should be unit prices for the removal of asbestos-containing materials (e.g., roofing materials, door caulk, and boiler insulations), as well as those non-asbestos-containing materials, which may be asbestos contaminated (i.e. carpeting, plywood, etc.).

- Project oversight will provide the Massachusetts Department of Transportation with on-site technical expertise during all phases of the abatement work. Project oversight provides a constant management of the abatement project to ensure that all identified asbestos-containing materials are removed in accordance with all applicable regulations and to prevent an asbestos fiber release. Tasks performed during project oversight should include periodic work inspections to ensure that all procedures employed by the abatement contractor are acceptable, and air monitoring around each work area to detect elevated asbestos fiber levels.

3.0 LEAD PAINT DETERMINATION

Atlas performed a limited lead-containing paint (LCP) determination on representative paints that will be impacted by the upcoming demolition project. The lead determination was performed by Atlas's Industrial Hygienist, Mr. Michael Puyana. Paint chip samples were submitted to Pace Analytical Laboratory (Pace) for analysis in accordance with EPA method SW846—7000B/3051. Pace is an AIHA-LAP Certified Laboratory with lab ID number: 102754. Paint Chip analysis results are located in Appendix B.

3.1 Summary of Findings

The table below provides the results of the lead paint testing. The Flame AAS readings are expressed in percent weight (% wt.).

Table 4 – Lead Paint Chip Analysis Results
Former Joseph Freeman Company Building
176 Armory Street
Springfield, Massachusetts

SAMPLE NUMBER	LOCATION	SUBSTRATE	COLOR	FLAME AAS RESULT (%WEIGHT)
Pb1	Interior – Lower Level	Wood	Multi-colored	0.128
Pb2	Interior – Lower Level	Metal	Multi-colored	0.062
Pb3	Exterior	Stucco	Pink	**3.46**
Pb4	Exterior	Wood	Brown	**10.8**
Pb5	Interior – Lower Level	CMU	White	**0.046**

<RL – Below Reporting Limit

3.2 Regulatory Implications and Regulations

The implications of lead paint existing in a non-residential building are related to the future use of the facility and the need to impact these painted surfaces during the repainting process.

The Occupational Safety and Health Administrative (OSHA) does not acknowledge any quantitative threshold for a lead-based paint. Paint with a detectable amount of lead, regardless of the level, is recognized as a lead-containing paint. The possible exposure hazard to workers impacting these coated surfaces should be assessed and contractors and their employees must adhere to the OSHA Lead in Construction standard found at 29 CFR 1926.62.

OSHA recognizes that construction type work on surfaces coated with lead-containing paint has a **potential** to expose workers to hazardous levels of lead and requires that appropriate safety and health measures be followed as stated in 29 CFR 1926.62. OSHA states that until the employer performs an exposure assessment and documents that employees are not exposed above the permissible exposure limit (PEL) of greater than 50 micrograms per cubic meter ($\mu g/m^3$) of air, the employer must treat employees as if they were exposed above the PEL for the following operations:

- Manual renovation and demolition of structures, manual scraping, manual sanding, and use of heat gun where lead-containing coatings or paints are present;
- Abrasive blasting;
- Power tool cleaning;
- Lead burning;
- Using lead-containing mortar or spray painting with lead-containing paint;

- Abrasive blasting, rivet busting, or welding, cutting, or burning on any structure where lead-containing coatings or paint are present;
- Cleanup activities where dry expendable abrasives are used; and
- Any other task the employer believes may cause exposure in excess of the PEL.

Work precautions include providing respiratory protection, protective work clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until an exposure assessment has determined that the work activity will result in an exposure below the PEL. Additional requirements under this standard include a written compliance program as well as record keeping.

4.0 PCBS IN BUILDING MATERIALS SURVEY

The survey objective was to evaluate for the presence of PCB-containing sealants (i.e. caulking and glazing materials) that would require special management as part of the planned building demolition project. The survey did not include testing of other surrounding building materials (i.e. masonry surrounds, frames, sills, etc.) adjacent to the sealants. The survey was on representative exterior building area on September 9, 2025, by Mr. Ricardo Nunes, Atlas inspector. The following is a summary of the survey field activities, analytical data and conclusions.

4.1 Overview of PCB-Containing Materials Regulatory Requirements

PCBs are often present in building material sealants such as caulking and glazing compounds manufactured prior to July 1979. In general, the PCBs were used in these materials as plasticizers and/or flame-retardants. EPA TSCA regulations stipulate procedures by which PCB-contaminated materials must be handled and disposed.

The management of PCB-containing materials is regulated by TSCA and associated 40 CFR §761 Regulations, as administered by the EPA. Depending upon PCB concentration and source, sealants, paints, and building materials with detectable PCBs are classified under TSCA as either PCB Bulk Product Wastes, PCB Remediation Wastes, or Excluded PCB Products, as noted below:

- PCB Bulk Product Wastes: Materials manufactured with PCBs at concentrations ≥50 parts per million (ppm) are classified as a PCB Bulk Product Waste and require special management practices in accordance with TCSA (40 CFR § 761). All PCB Bulk Product Waste must be removed and disposed at a licensed facility which can accept PCB Bulk Product Wastes. PCB Bulk Product Waste is managed in accordance with 40 CFR 761.62 and most often under 761.62(b) – Disposal in solid waste landfills. This includes TSCA landfills and some non-TSCA landfills. Removal and disposal of PCB Bulk Product Waste in accordance with 40 CFR 761.62(b) does not require EPA approval.

- PCB Remediation Wastes: Materials that contain PCBs because they have been contaminated by nearby PCB Bulk Product Wastes are classified as a PCB Remediation Waste. These materials must be disposed at a licensed facility that can accept PCB Remediation Wastes, unless they are removed and disposed together with the nearby PCB Bulk Product Waste, in which case they too may be considered PCB Bulk Product Wastes. EPA approval is required if decontamination/treatment of PCB Remediation Wastes will occur on-site or if PCB Remediation Waste will remain on-site.

- Excluded PCB Products: Materials with PCBs at concentrations <50 ppm can be classified as an Excluded PCB Product if these levels are not due to contamination from sealants, paints or other materials that are considered a PCB Bulk Product Waste. An Excluded PCB Product, as defined in 40 CFR 761.3, must also meet the following additional conditions:

  - The products or source of the products containing <50 ppm concentration PCBs were legally manufactured, processed, distributed in commerce, or used before October 1, 1984;
  - The products or source of the products containing <50 ppm concentrations PCBs were legally manufactured, processed, distributed in commerce, or used, i.e., pursuant to authority granted by EPA regulation, by exemption petition, by settlement agreement, or pursuant to other Agency-approved programs; and
  - The resulting PCB concentration (i.e. <50 ppm) is not a result of dilution, or leaks and spills of PCBs in concentrations >50 ppm.

Excluded PCB Products may be managed at any permitted waste management or recycling facility as long as they are made aware that the material being sent to them contains PCBs and their permit allows them to accept this type of material. Many solid waste and recycling facilities cannot accept materials that contain PCBs ≥2 ppm. Workers handling Excluded PCB Products must also be made aware that these materials are present.

Sealants, as well as other building materials, with PCBs <1 ppm and not impacted by a PCB Bulk Product are not regulated under TSCA and may be managed as typical demolition debris.

The PCB classifications assigned to sampled materials at the Site are based upon the highest reported PCB concentration for each material, as required by TSCA.

4.2 Field Activities

Atlas identified and collected one (1) bulk sample of suspect door caulk material from the exterior area of the building. The sample was collected and analyzed on prevalence at the Site. Unique sealant material was identified based upon setting (e.g. sealant use, building location, type of materials abutting sealant, etc.) and physical properties (e.g. color and texture).

The sample was collected using hand tools (i.e. utility knife, screwdriver, hammer, pliers, chisel, etc.) that was decontaminated with hexane and paper towels after sampling. The sample was then transported under chain-of-custody to Pace Analytical Services, (Pace) of East Longmeadow, Massachusetts, for PCB analysis. The sample was extracted following EPA Method 3540C for Soxhlet extraction and analyzed following EPA Method 8082 (PCB Aroclors).

4.3 Laboratory Analytical Results

The PCB analytical results are summarized in the following table. The full results are presented in the laboratory report in Appendix C.

Table 5: PCB Sampling Summary

Former Joseph Freeman Company Building
176 Armory Street
Springfield, Massachusetts

Sample ID	Sample Material	Material Location(s)	Estimated Quantity	ACM	Total PCBs* (ppm)	PCB Type
1	Door Caulk	Exterior	1 Each	Yes	**(4.6)**	Excluded PCB Product

Notes:
PCB concentrations shown in parts per million (ppm).
ND = Not detected above the indicated laboratory reporting limit.
ACM = Asbestos-Containing Material.

*Total PCBs is the sum of individual PCB Aroclors
Bold = PCBs detected in sample.
Shaded = PCBs Detected >50 ppm. Material is PCB Bulk Product.
Shaded = PCBs Detected >1 ppm and assumed to be PCB Remediation Waste.
Quantities are not provided for samples that were non-detect or samples considered Excluded PCB Product.

PCBs were detected in the suspect material identified by Atlas, at a maximum concentration of 4.6 ppm. Laboratory reporting limits were suitably low. The material with detected PCBs is defined as Excluded PCB Product under TSCA, as noted in the table above.

Quality Control/Quality Assurance Review

Atlas reviewed the quality assurance/quality control (QA/QC) information presented in the laboratory analytical reports (Appendix C) to confirm that the data were of sufficient quality to support the recommendations and conclusions presented in this report.

As presented in the analytical laboratory report, all analytical method QA/QC requirements were met for the samples. A dilution was performed as part of the standard analytical procedure.

4.4 Conclusions

Based upon the data summarized above, Atlas draws the following conclusions:

- The door caulk material where PCBs were detected at maximum concentrations between ND and 4.6 ppm is presumed to have originally contained PCBs at the detected concentrations. The material is categorized as Excluded PCB Product, as summarized in Table 4, and should be handled as outlined in Section 4.5.

4.5 Recommendations

Materials that are classified as Excluded PCB Products may be managed by any permitted waste management facility as long as the facility is made aware of the fact that material being sent to them contains PCBs and their permit allows them to accept these types of materials. Many solid waste and recycling facilities cannot accept materials that contain ≥2 ppm PCBs. Workers handling Excluded PCB Products must also be made aware that these materials contain PCBs.

APPENDIX A

ASBESTOS BULK SAMPLE ANALYSIS RESULTS BY PLM

Asbestos Identification Laboratory.
165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600
Web: www.asbestosidentificationlab.com Email: mikemanning@asbestosidentificationlab.com

NVLAP® Testing Lab Code: 200919-0

Batch: 141486

Michael Puyana
Atlas Technical Services, Woburn
10 State Street
Suite 100
Woburn, MA 01801

Project Information

176 Armory St.,
Springfield

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

Dear Michael Puyana,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project. The Analysis Method is BULK PLM ANALYSIS, EPA/600/R-93/116The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.
The EPA recommends you should assume vermiculite contains asbestos and not to disturb it. Airborne asbestos fibers present a health risk through inhalation, so the first step is to not disturb the material, which could release fibers into the air. If you disturb the insulation, you may inhale some asbestos fibers. The degree of health risk depends on how much and how often this occurred. If you choose to remove the vermiculite insulation, this work should be done by a trained and accredited asbestos abatement contractor that is separate and independent from the company that performed the assessment of the vermiculite insulation to avoid any conflict of interest. Link: "https://www.epa.gov/asbestos/my-attic-has-vermiculite-insulation-it-am-i-risk-should-i-take-it-outld I take it out? | US EPA"
Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Information provided by the customer can affect the validity of results. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. All customer information will be maintained in confidentiality. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Michael Puyana for your business.

Michael Manning
Owner/Director

Proposal No. 609409-133236

Michael Puyana
Atlas Technical Services, Woburn
10 State Street
Suite 100
Woburn, MA 01801

Project Information

176 Armory St.,
Springfield

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1A / 1593187	Ceiling Finish on Gypsum Board	Interior-Lower Level	white	Non-Fibrous 100	None Detected
1B / 1593188	Ceiling Finish on Gypsum Board	Interior-Lower Level	white	Non-Fibrous 100	None Detected
1C / 1593189	Ceiling Finish on Gypsum Board	Interior-Lower Level	white	Non-Fibrous 100	None Detected
2A / 1593190	Door Caulk	Exterior	brown	Non-Fibrous 97	**Detected** Chrysotile 3
2B / 1593191	Door Caulk	Exterior			Not Analyzed
3A / 1593192	Wall Paneling Mastic	Interior	brown	Non-Fibrous 100	None Detected
3B / 1593193	Wall Paneling Mastic	Interior	brown	Non-Fibrous 100	None Detected
4A / 1593194	Stucco Finish	Exterior Walls	multi	Non-Fibrous 100	None Detected
4B / 1593195	Stucco Finish	Exterior Walls	multi	Non-Fibrous 100	None Detected
4C / 1593196	Stucco Finish	Exterior Walls	multi	Non-Fibrous 100	None Detected
4D / 1593197	Stucco Finish	Exterior Walls	multi	Non-Fibrous 100	None Detected
4E / 1593198	Stucco Finish	Exterior Walls	multi	Non-Fibrous 100	None Detected
5A / 1593199	Vent Pipe Mastic	Roof	black	Non-Fibrous 90	**Detected** Chrysotile 10
5B / 1593200	Vent Pipe Mastic	Roof			Not Analyzed
6A / 1593201	Floor Tile-Under Carpet	Interior	gray	Non-Fibrous 100	None Detected
6B / 1593202	Floor Tile-Under Carpet	Interior	gray	Non-Fibrous 100	None Detected

Sampled: September 02, 2025 **Received:** September 05, 2025 **Analyzed:** September 08, 2025

Tuesday 09 September

Analyzed by: Nathan Chann **Batch:** 141486

Michael Puyana
Atlas Technical Services, Woburn
10 State Street
Suite 100
Woburn, MA 01801

Project Information

176 Armory St.,
Springfield

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
7A / 1593203	Mastic on Floor Tile-Under Carpet	Interior	brown	Non-Fibrous 100	None Detected
7B / 1593204	Mastic on Floor Tile-Under Carpet	Interior	brown	Non-Fibrous 100	None Detected
8A / 1593205	Residual Cove Base Mastic	Interior-Hidden Paneling	black	Non-Fibrous 100	None Detected
8B / 1593206	Residual Cove Base Mastic	Interior-Hidden Paneling	black	Non-Fibrous 100	None Detected
9A / 1593207	Ceiling Tile Glue Daubs	Interior	brown	Non-Fibrous 100	None Detected
9B / 1593208	Ceiling Tile Glue Daubs	Interior	brown	Non-Fibrous 100	None Detected
10A / 1593209	1x1 Ceiling Tiles	Interior	brown	Cellulose 90 Non-Fibrous 10	None Detected
10B / 1593210	1x1 Ceiling Tiles	Interior	brown	Cellulose 90 Non-Fibrous 10	None Detected
11A / 1593211	Window Glaze	Exterior	multi	Non-Fibrous 100	None Detected
11B / 1593212	Window Glaze	Exterior	multi	Non-Fibrous 100	None Detected
12A / 1593213	Gypsum Ceiling Board	Interior-Lower Level	white	Cellulose 5 Non-Fibrous 95	None Detected
12B / 1593214	Gypsum Ceiling Board	Interior-Lower Level	white	Cellulose 5 Non-Fibrous 95	None Detected
13A / 1593215	Carpet Mastic	Interior	tan	Non-Fibrous 100	None Detected
13B / 1593216	Carpet Mastic	Interior	tan	Non-Fibrous 100	None Detected
14A / 1593217	Window Glaze	Interior-Lower Level	multi	Non-Fibrous 100	None Detected
14B / 1593218	Window Glaze	Interior-Lower Level	multi	Non-Fibrous 100	None Detected

Sampled: September 02, 2025 **Received:** September 05, 2025 **Analyzed:** September 08, 2025

Tuesday 09 September

Analyzed by: Nathan Chann **Batch:** 141486

Proposal No. 609409-133236

Michael Puyana
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10 State Street
Suite 100
Woburn, MA 01801

Project Information

176 Armory St.,
Springfield

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
15A / 1593219	CMU Block Mortar	Interior-Lower Level	gray	Non-Fibrous 100	None Detected
15B / 1593220	CMU Block Mortar	Interior-Lower Level	gray	Non-Fibrous 100	None Detected
16A / 1593221	Roof Paper Underlay	Interior-Lower Level	brown	Cellulose 80 Non-Fibrous 20	None Detected
16B / 1593222	Roof Paper Underlay	Interior-Lower Level	brown	Cellulose 80 Non-Fibrous 20	None Detected
17A / 1593223	Asphalt Shingle	Gable End	black	Cellulose 40 Non-Fibrous 60	**Detected** **Chrysotile < 1**
17B / 1593224	Asphalt Shingle	Gable End	black	Cellulose 40 Non-Fibrous 60	**Detected** **Chrysotile < 1**
18A / 1593225	Asphalt Underlay	Gable End	black	Cellulose 60 Non-Fibrous 40	**Detected** **Chrysotile < 1**
18B / 1593226	Asphalt Underlay	Gable End	black	Cellulose 60 Non-Fibrous 40	**Detected** **Chrysotile < 1**
19A / 1593227	Asphalt Shingle-Bottom Layer	Roof	black	Cellulose 60 Non-Fibrous 40	**Detected** **Chrysotile < 1**
19B / 1593228	Asphalt Shingle-Bottom Layer	Roof	black	Cellulose 60 Non-Fibrous 40	**Detected** **Chrysotile < 1**
20A / 1593229	Asphalt Shingle-2nd Layer	Roof	black	Cellulose 60 Non-Fibrous 40	**Detected** **Chrysotile < 1**
20B / 1593230	Asphalt Shingle-2nd Layer	Roof	black	Cellulose 60 Non-Fibrous 40	**Detected** **Chrysotile < 1**
21A / 1593231	Asphalt Shingle-3rd Layer	Roof	black	Fiberglass 30 Non-Fibrous 70	None Detected
21B / 1593232	Asphalt Shingle-3rd Layer	Roof	black	Fiberglass 30 Non-Fibrous 70	None Detected
22A / 1593233	Asphalt Shingle-Top Layer	Roof	black	Fiberglass 30 Non-Fibrous 70	None Detected
22B / 1593234	Asphalt Shingle-Top Layer	Roof	black	Fiberglass 30 Non-Fibrous 70	None Detected

Sampled: September 02, 2025 **Received:** September 05, 2025 **Analyzed:** September 08, 2025

Tuesday 09 September

Analyzed by: Nathan Chann **Batch:** 141486

A00882 - 23

Michael Puyana
Atlas Technical Services, Woburn
10 State Street
Suite 100
Woburn, MA 01801

Project Information

176 Armory St.,
Springfield

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
23A / 1593235	Internal Fire Brick	Boiler	white	Non-Fibrous 100	None Detected
23B / 1593236	Internal Fire Brick	Boiler	white	Non-Fibrous 100	None Detected
24A / 1593237	Boiler Corrugated Insulation	Boiler	multi	Non-Fibrous 30	**Detected** Chrysotile 70
24B / 1593238	Boiler Corrugated Insulation	Boiler			Not Analyzed
24C / 1593239	Boiler Corrugated Insulation	Boiler			Not Analyzed
25A / 1593240	Flue Cement	Boiler Area	gray	Non-Fibrous 100	None Detected
25B / 1593241	Flue Cement	Boiler Area	gray	Non-Fibrous 100	None Detected
26A / 1593242	Side Box Insulation	Boiler	brown	Fiberglass 40 Mineral Wool 30 Non-Fibrous 25	**Detected** Chrysotile 5
26B / 1593243	Side Box Insulation	Boiler			Not Analyzed
26C / 1593244	Side Box Insulation	Boiler			Not Analyzed
27A / 1593245	Refractory Insulation	Boiler	brown	Fiberglass 40 Mineral Wool 30 Non-Fibrous 25	**Detected** Chrysotile 5
27B / 1593246	Refractory Insulation	Boiler			Not Analyzed
27C / 1593247	Refractory Insulation	Boiler			Not Analyzed

Sampled: September 02, 2025 **Received:** September 05, 2025 **Analyzed:** September 08, 2025

Tuesday 09 September

Analyzed by: Nathan Chann **Batch:** 141486

Proposal No. 609409-133236

CHAIN OF CUSTODY

EPA/600/R-93/116

Page 1 of 13

Client: Atlas Technical
Address: Woburn
Project Site & #: 176 Armory St, Springfield
Phone / email address:
Contact: M. Puzana
Relinquish by/date: 9-4-25
Received by/date: 9/5/25
# of Samples Received: 61

Asbestos Identification Lab
165 New Boston St.
Suite 227
Woburn, MA 01801
(781)932-9600
www.asbestosidentificationlab.com

Date Sampled: 9-2-25

BATCH# 141486 Rev 12/24

Turnaround Time: [ ] Less 3 Hrs [ ] Same Day [ ] Next Day [X] Two Day [ ] Three Day

Sample Method: [X] Bulk [ ] Soil [ ] Wipe [ ] Point Count [ ] NOB

Stop on 1st Positive? (Yes)/No

Analyzed By: Jonathan Chavez

Date: 9/8/25 QC by: MM

Temp in Celsius = 23

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: II	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
1593187	1A	Material: Ceiling finish on gypsum board Location: Interior - Lower Level	0	W	N	G	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
88	1B	Material Location	0	W	N	G	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
89	1C	Material Location	0	W	N	G	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100

A00882 - 25

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ / Material / Location	Stereomicroscope					Asbestos Minerals	Optical Properties						RI		Non-Asbestos Percentage (%)						
			% of Asbestos	Color	Homogeneity	Texture	Friable		Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	∥	⊥	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
90	2A	Material DOOR CAULK Location EXTERIOR	0	Br	~	G	~	Chrysotile	3	W	P	+	L	~	1.558	1.551							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															97
91	2B	Material ↓ Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															DNA
92	3A	Material WALL PARGING MASTIC Location EXTERIOR	0	Br	Y	G	~	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															W
93	3B	Material ↓ Location	0	Br	Y	G	~	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															W
94	4A	Material STUCCO FINISH Location EXTERIOR WALLS	0	Wh	~	G	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															W

Proposal No. 609409-133236

A00882 - 26

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
95	4B	Material Stucco finish Location Exterior walls 3k	0	M	N	L	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
96	4C	Material Location	0	M	N	L	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
97	4D	Material Location	0	M	N	L	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
98	4E	Material Location	0	M	N	L	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
99	5A	Material Vent Pipe mastic Location Roof 5'	0	Bk	N	L	N	Chrysotile	10	W	F	+	L	N	1558	1551							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															90

Proposal No. 609409-133236

A00882 - 27

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
00	5B	Material Vent Pipe mastic Location Roof						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															1%
01	6A	Material Floor Tile - under carpet Location Interior 600	0	Gy	N	F	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															10
02	6B	Material ↓ Location	0	Gy	N	F	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															10
03	7A	Material Mastic on Floor Tile - under carpet Location Interior	0	Br	Y	F	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															1%
04	7B	Material ↓ Location	0	Br	Y	F	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															1%

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A00882 - 28

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope					Asbestos Minerals	Optical Properties						RI		Non-Asbestos Percentage (%)						
			% of Asbestos	Color	Homogeneity	Texture	Friable		Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	∥	⊥	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
05	8A	Material Residual cove base mastic Location Interior - Hard Parging	0	Blk	Y	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															lw
06	8B	Material ✓ Location	0	Blk	Y	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															lw
07	9A	Material Ceiling Tile Glue Russ Location Exterior	0	Br	Y	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															lw
08	9B	Material ✓ Location	0	Br	Y	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															lw
09	10A	Material 1X1 Ceiling Tiles Location Exterior	0	Br	Y	G	Y	Chrysotile															
								Amosite															
								Crocidolite											R FE				
								Tremolite															
								Anthophyllite															
								Actinolite											qv				lo

Proposal No. 609409-133236

A00882 - 29

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: =	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
10	10B	Material 1X1 Ceiling Tiles Location Exterior	0	Brn	Y	G	Y	Chrysotile											P IF				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											QV				10
11	11A	Material Window Glaze Location Exterior	0	M	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															10
12	11B	Material ✓ Location	0	M	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
13	12A	Material Gypsum Ceiling Board Location Exterior - Lower Level	0	W	Y	G	Y	Chrysotile															
								Amosite											P IF				
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											5				95
14	12B	Material ✓ Location	0	W	Y	G	Y	Chrysotile															
								Amosite											P IF				
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											5				95

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A00882 - 30

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
15	13A	Material Carpet mastic Location Interior	0	T	Y	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
16	13B	Material ✓ Location	0	T	Y	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
17	14A	Material Window glaze Location Interior-Lower Level	0	M	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
18	14B	Material ✓ Location	0	M	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
19	15A	Material CMU block mortar Location Interior-Lower Level	0	G-Y	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100

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A00882 - 31

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
20	15B	Material CMU Block mortar Location Interior - Lower Level	0	Gy	N	C	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															10
21	16A	Material Roof Paper underlay Location Interior - Lower Level	0	Br	N	C	N	Chrysotile															
								Amosite															
								Crocidolite											R-IE				
								Tremolite															
								Anthophyllite															
								Actinolite											80				20
22	16B	Material ↓ Location	0	Br	N	C	N	Chrysotile															
								Amosite															
								Crocidolite											R-IE				
								Tremolite															
								Anthophyllite															
								Actinolite											80				20
23	17A	Material Asphalt shingle Location Gable End	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	L	N	1.558	1.551							
								Amosite											R-IE				
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											40				60
24	17B	Material ↓ Location	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	L	N	1.558	1.551							
								Amosite											R-IE				
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											40				60

Proposal No. 609409-133236

A00882 - 32

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ / Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
25	18A	Material Asphalt shingle Uniform lax Location Gable End	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	L	N	1.558	1.551			R FE				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											60				40
26	18B	Material ↓ Location	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	L	N	1.558	1.551			R FE				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											60				40
27	19A	Material Asphalt shingle — Bottom Layer Location Roof	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	L	N	1.558	1.551			R FE				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											60				40
28	19B	Material ↓ Location	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	C	N	1.558	1.551			R FE				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											60				40
29	20A	Material Asphalt shingle — 2nd layer Location Roof	0	Blk	N	C	N	Chrysotile	Tr	W	P	+	C	N	1.558	1.551			R FE				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											60				40

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A00882 - 33

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ / Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: II	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
30	20B	Material Asphalt shingle-2nd layer Location Roof	0	Blk	~	G	~	Chrysotile	Tr	W	P	+	L	~	1.558	1.551			R IF				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											60				40
31	21A	Material Asphalt shingle-3rd layer Location Roof	0	Blk	~	G	~	Chrysotile															
								Amosite															
								Crocidolite									5						
								Tremolite															
								Anthophyllite															
								Actinolite									30						70
32	21B	Material ↓ Location	0	Blk	~	G	~	Chrysotile															
								Amosite															
								Crocidolite									5						
								Tremolite															
								Anthophyllite															
								Actinolite									30						70
33	22A	Material Asphalt shingle-Top layer Location Roof	0	Blk	~	G	~	Chrysotile															
								Amosite															
								Crocidolite									5						
								Tremolite															
								Anthophyllite															
								Actinolite									30						70
34	22B	Material ↓ Location	0	Blk	~	G	~	Chrysotile															
								Amosite															
								Crocidolite									5						
								Tremolite															
								Anthophyllite															
								Actinolite									30						70

Proposal No. 609409-133236

A00882 - 34

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ‖	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
35	23A	Material Internal Fire Brick Location Boiler 55F	0	w	n	b	n	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
36	23B	Material ↓ Location	0	w	n	b	n	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
37	24A	Material Boiler Corrugated Insulation Location Boiler 23SF	70	m	n	b	y	Chrysotile	70	w	p	+	l	n	1.558	1.551							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															30
38	24B	Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															
39	24C	Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															

Proposal No. 609409-133236

A00882 - 35

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: II	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
40	25A	Material Flue Cement Location Boiler Area	0	Gy	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
41	25B	Material Location ↓	0	Gy	N	G	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
42	26A	Material Side Box Insulation Location Boiler	0	Br	N	G	Y	Chrysotile	5	W	P	+	C	N	1.558	1.551	5 F	35 F					
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite									40	30					25
43	26B	Material Location ↓						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															DNA
44	26C	Material ↓ Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															DNA

Proposal No. 609409-133236

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Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ___ / Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
45	27A	Material Refractory Insulation Location Boiler	0	Br	N	G	Y	Chrysotile	5	M	P	+	C	N	1.538	1551	5	35					
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite									40	30					25
46	27B	Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															
1593247	27C	Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															
		Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															
		Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															

Proposal No. 609409-133236

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APPENDIX B

LEAD PAINT CHIP ANALYSIS RESULTS

Telephone: 781-935-3212
Facsimile: 781-932-4857
Email: BostonAero@PaceLabs.com

Laboratory Report

Contact: Mike Puyana
Client: Atlas Technical Consultants, LLC
Address: 10 State St., Suite 100
Woburn, MA 01801

Batch #: C 320571
Date received: 9/5/2025
Date analyzed: 9/9/2025
Date of report: 9/9/2025

Project # N/A
P.O.# N/A
Project Site: 176 Armory St.
Springfield

AIHA-LAP, LLC Lab ID: 102754

Lead Analysis In Paint Using SOP Based on SW846-7000B/3051
Results in weight percent on an "as received" weight basis

Lab ID	Client ID	Sample date	Description	Result	Reporting Limit	Comments
C 763039	Pb1	9/2/25	Wood Trim Multi-Color Interior Lower Level	0.128	0.023	
C 763040	Pb2	9/2/25	Metal Pipe Interior Lower Level Multi-Color	0.062	0.028	
C 763041	Pb3	9/2/25	Stucco Pink Exterior	3.46	0.019	
C 763042	Pb4	9/2/25	Wood Door Frame Brown Exterior	10.8	0.028	
C 763043	Pb5	9/2/25	Masonry White Interior Lower Level	0.046	0.022	

Sydney Strong, Technical Manager Chemistry
Aimee Cormier, Lab Director

Unless otherwise indicated, all samples were received in acceptable condition.
All results apply only to the samples tested and as received and are accurate to no more than three significant figures.
Unless otherwise indicated, all the quality control criteria for the method above have been met.
RL-Reporting Limit(% by weight) Note on units: mg/Kg is the same as ppm by weight
RL-Reporting Limit: Defined as the lowest concentration the laboratory can accurately quantitate.
The Report shall not be reproduced except in full without the written approval of the laboratory.
Please visit our website at www.PaceLabs.com for the current accreditation status.

ASSOCIATES, INCORPORATED
A Pace Analytical® Laboratory
Woburn, MA 01801
(781) 935-3212
Boston@aerobiology.net

Rush/<6 Hours — Turn Around Time Requested: Same Day | Next Day | 2 Day (X) | 3 Day | 5 Days

Client: Atlas Technical Consultants

Address Street: Woburn

Town: 176 Armory St.

State/Zip: Springfield

Project Site Line 1: M Puyana

Line 2:

Contact:

Project Number:

PO:

Phone:

FAX:

Alt/Pager:

☐ NELAC analysis

TYPE OF ANALYSIS (circle)

DUST WIPES	PAINT (0.1 g)	SOIL (1 g)
AIR	TSP	TCLP (100g)
(mln)	PM10	Other

Please use a separate form for each matrix.

Element: gravimetric
Pb (circled) Cd Cr As Fe
Se Ag Ba Hg
Other (please specify under Comments)

For Laboratory Use
BATCH NUMBER: C 320971
☐ QC

☐ ASTM E1792

FOR LABORATORY USE ONLY

Date and Time Sampled	Field I.D.	Sample Description/Location	Air Sampling Information: Start Time	End Time	Start Flowrate	End Flowrate	Volume (liters)	Wiped area: length (inch)	width (inch)	Area (sq in)	ANALYSIS: Weight (grams)	Dil'n	AA/ ICP Reading	RESULT	Lab I.D.
9-2-25	P61	WOOD TRIM - MULTI-color - Exterior Lower Level													703039
	P62	METAL PIPE - Interior Lower Level - multi color													40
	P63	STUCCO - PINK - EXTERIOR													41
	P64	WOOD DOOR frame - Brown - Exterior													42
	P65	MASONRY - WHITE - Interior Lower Level													43

Relinquished By: [signature] Date: 9-2-25 Time:
Received By: [signature] Date: 9.5.25 Time: 9:40
Comments:

ver 5.5

Field blanks are required for air and wipe samples per the sampling method and should be from the same source lot as was used for the collected field samples.
Proscience Analytical Services reserves the right to subcontract samples to an appropriately accredited laboratory when we are unable to perform the analysis in house.

PAGE _____ OF _____

APPENDIX C

PCBS ANALYSIS RESULTS

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

September 11, 2025

Ric Nunes
Atlas Technical Consultants LLC - Woburn
10 State Street, Suite 100
Woburn, MA 01801

Project Location: 176 Armory St., Springfield, MA
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 25I0045

Enclosed are results of analyses for samples as received by the laboratory on September 2, 2025. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rebecca Faust
Project Manager

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Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Atlas Technical Consultants LLC - Woburn
10 State Street, Suite 100
Woburn, MA 01801
ATTN: Ric Nunes

REPORT DATE: 9/11/2025

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 25I0045

The results of analyses performed on the following samples submitted to Pace Analytical Services, LLC - East Longmeadow, Ma, are found in this report.

PROJECT LOCATION: 176 Armory St., Springfield, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PCB1- Door Caulk - Exterior	25I0045-01	Caulk		SW-846 8082A	

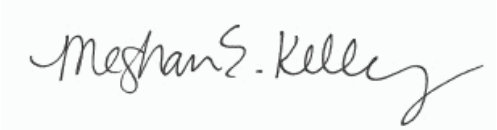
Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to Pace Analytical Services, LLC - East Longmeadow, Ma, for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Meghan E. Kelley
Reporting Specialist

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 176 Armory St., Springfield, MA | Sample Description: | Work Order: 25I0045

Date Received: 9/2/2025

Field Sample #: PCB1- Door Caulk - Exterior | Sampled: 9/2/2025 00:00

Sample ID: 25I0045-01

Sample Matrix: Caulk

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1221 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1232 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1242 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1248 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1254 [2]	3.5	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1260 [1]	1.1	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1262 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW
Aroclor-1268 [1]	ND	0.80	mg/Kg	4		SW-846 8082A	9/5/25	9/10/25 15:29	MEW

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	106	30-150		9/10/25 15:29
Decachlorobiphenyl [2]	105	30-150		9/10/25 15:29
Tetrachloro-m-xylene [1]	99.0	30-150		9/10/25 15:29
Tetrachloro-m-xylene [2]	93.8	30-150		9/10/25 15:29

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method:SW-846 3540C **Analytical Method:SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
25I0045-01 [PCB1- Door Caulk - Exterior]	B412742	0.503	10.0	09/05/25

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B412742 - SW-846 3540C										
Blank (B412742-BLK1)				Prepared: 09/05/25 Analyzed: 09/10/25						
Aroclor-1016	ND	0.20	mg/Kg							
Aroclor-1016 [2C]	ND	0.20	mg/Kg							
Aroclor-1221	ND	0.20	mg/Kg							
Aroclor-1221 [2C]	ND	0.20	mg/Kg							
Aroclor-1232	ND	0.20	mg/Kg							
Aroclor-1232 [2C]	ND	0.20	mg/Kg							
Aroclor-1242	ND	0.20	mg/Kg							
Aroclor-1242 [2C]	ND	0.20	mg/Kg							
Aroclor-1248	ND	0.20	mg/Kg							
Aroclor-1248 [2C]	ND	0.20	mg/Kg							
Aroclor-1254	ND	0.20	mg/Kg							
Aroclor-1254 [2C]	ND	0.20	mg/Kg							
Aroclor-1260	ND	0.20	mg/Kg							
Aroclor-1260 [2C]	ND	0.20	mg/Kg							
Aroclor-1262	ND	0.20	mg/Kg							
Aroclor-1262 [2C]	ND	0.20	mg/Kg							
Aroclor-1268	ND	0.20	mg/Kg							
Aroclor-1268 [2C]	ND	0.20	mg/Kg							
Surrogate: Decachlorobiphenyl	*4.22*		mg/Kg	3.978		106	30-150			
Surrogate: Decachlorobiphenyl [2C]	*3.98*		mg/Kg	3.978		100	30-150			
Surrogate: Tetrachloro-m-xylene	*3.88*		mg/Kg	3.978		97.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*3.49*		mg/Kg	3.978		87.8	30-150			
LCS (B412742-BS1)				Prepared: 09/05/25 Analyzed: 09/10/25						
Aroclor-1016	3.4	0.20	mg/Kg	3.979		85.3	40-140			
Aroclor-1016 [2C]	3.3	0.20	mg/Kg	3.979		82.0	40-140			
Aroclor-1260	3.8	0.20	mg/Kg	3.979		96.6	40-140			
Aroclor-1260 [2C]	3.6	0.20	mg/Kg	3.979		91.5	40-140			
Surrogate: Decachlorobiphenyl	*4.11*		mg/Kg	3.979		103	30-150			
Surrogate: Decachlorobiphenyl [2C]	*3.92*		mg/Kg	3.979		98.4	30-150			
Surrogate: Tetrachloro-m-xylene	*3.68*		mg/Kg	3.979		92.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*3.36*		mg/Kg	3.979		84.3	30-150			
LCS Dup (B412742-BSD1)				Prepared: 09/05/25 Analyzed: 09/10/25						
Aroclor-1016	3.5	0.20	mg/Kg	3.976		87.7	40-140	2.67	30	
Aroclor-1016 [2C]	3.4	0.20	mg/Kg	3.976		85.4	40-140	3.91	30	
Aroclor-1260	3.9	0.20	mg/Kg	3.976		97.0	40-140	0.323	30	
Aroclor-1260 [2C]	3.8	0.20	mg/Kg	3.976		94.9	40-140	3.57	30	
Surrogate: Decachlorobiphenyl	*4.12*		mg/Kg	3.976		104	30-150			
Surrogate: Decachlorobiphenyl [2C]	*3.96*		mg/Kg	3.976		99.7	30-150			
Surrogate: Tetrachloro-m-xylene	*3.85*		mg/Kg	3.976		96.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*3.55*		mg/Kg	3.976		89.3	30-150			

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

PCB1- Door Caulk - Exterior

Lab Sample ID: 25I0045-01 Date(s) Analyzed: 09/10/2025 09/10/2025

Instrument ID (1): ECD4 Instrument ID (2): ECD4

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	0.000	0.000	3.2	
	2	0.000	0.000	0.000	3.5	9.0
Aroclor-1260	1	0.000	0.000	0.000	1.1	
	2	0.000	0.000	0.000	0.94	15.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B412742-BS1 Date(s) Analyzed: 09/10/2025 09/10/2025

Instrument ID (1): ECD4 Instrument ID (2): ECD4

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	3.4	
	2	0.000	0.000	0.000	3.3	3.0
Aroclor-1260	1	0.000	0.000	0.000	3.8	
	2	0.000	0.000	0.000	3.6	5.4

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B412742-BSD1 Date(s) Analyzed: 09/10/2025 09/10/2025

Instrument ID (1): ECD4 Instrument ID (2): ECD4

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	3.5	
	2	0.000	0.000	0.000	3.4	2.9
Aroclor-1260	1	0.000	0.000	0.000	3.9	
	2	0.000	0.000	0.000	3.8	2.6

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

No results have been blank subtracted unless specified in the case narrative section.

Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications

No certified Analyses included in this Report

Pace Analytical Services, LLC - East Longmeadow, Ma, operates under the following certifications and accreditations:

Code	Description	Number	Expires

J5I0945 RF

Pace Analytical

Phone: 413-525-2332
Fax: 413-525-6405
Access COC's and Support Requests

http://www.pacelabs.com

CHAIN OF CUSTODY RECORD

Doc # 381 Rev 5_07/13/2021

39 Spruce Street
East Longmeadow, MA 01028

Page ____ of ____

Company Name:	Atlas Technical
Address:	Woburn
Phone:	
Project Name:	176 Armory St
Project Location:	Springfield
Project Number:	
Project Manager:	R Nunes
Pace Quote Name/Number:	
Invoice Recipient:	R Nunes
Sampled By:	M. Puyana

Requested Turnaround Time

7-Day [X] 10-Day [ ]
PFAS 10-Day (std) [ ] Due Date:

Rush Approval Required

1-Day [ ] 3-Day [ ]
2-Day [ ] 4-Day [ ]

Data Delivery

Format: PDF [X] EXCEL [ ]
Other:
CLP Like Data Pkg Required: [ ]
Email To: See below
Fax To #:

Dissolved Metals Samples

○ Field Filtered
○ Lab to Filter

Orthophosphate Samples

○ Field Filtered
○ Lab to Filter

PCB ONLY

SOXHLET [X]
NON SOXHLET [ ]

ANALYSIS REQUESTED

8082 Soxhlet

Pace Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	[1]Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE
1	PCB1-Door Caulk-Exterior			G	SOL			X			

[2] Preservation Code

Courier Use Only

Total Number Of:

VIALS_____
GLASS_____
PLASTIC_____
BACTERIA_____
ENCORE_____

Glassware in the fridge? Y / N

Glassware in freezer? Y / N

Prepackaged Cooler? Y / N

*Pace Analytical is not responsible for missing samples from prepacked coolers

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

Relinquished by: (signature)	Date/Time: 9-2-25
Received by: (signature)	Date/Time: 9/2/25 1114
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Client Comments: Results To Michael Puyana & Ric Nunes

Detection Limit Requirements

MA
CT
Other:

Special Requirements

[ ] MA MCP Required
MCP Certification Form Required
[ ] CT RCP Required
RCP Certification Form Required
[ ] MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

NELAC and AIHA-LAP, LLC Accredited

Project Entity

Government [ ] Municipality [ ] MWRA [ ] WRTA [ ]
Federal [ ] 21 J [ ] School [ ]
City [ ] Brownfield [ ] MBTA [ ]

Other
[ ] Chromatogram
[ ] *AIHA-LAP,LLC*

Comments:

Disclaimer: Pace Analytical is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Pace Analytical values your partnership on each project and will try to assist with missing information, but will not be held accountable.

Pace	DC#_Title: ENV-FRM-ELON-0001 v08_Sample Receiving Checklist
	Effective Date: 06/11/2024

Log In Back-Sheet

Client: Attos

Project: 176 Armory Street

MCP/RCP Required: no

Deliverable Package Requirement: none

Location: 176 Armory St. Springfield, MA

PWSID# (When Applicable): n/a

Arrival Method:

Courier ☐ Fed Ex ☐ Walk In ☑ Other ☐

Received By / Date / Time: LA 9/2/25 1416

Back-Sheet By / Date / Time: MAM 9/2/25 1456

Temperature Method: Gun # 6

WV samples: Yes (see note*) / No (follow normal procedure)

Temp < 6° C Actual Temperature: 27.8

Rush Samples: Yes / No Notify: No

Short Hold: Yes / No Notify: No

Notes regarding Samples/COC outside of SOP:

* Walked in, hand to hand (temp direct from sampling).

Login Sample Receipt Checklist – (Rejection Criteria Listing – Using Acceptance Policy) Any False statement will be brought to the attention of the Client – True or False

	True	False
Received on Ice	☐	☑ See notes
Received in Cooler	☐	☑
Custody Seal: DATE TIME	☐	☑
COC Relinquished	☑	☐
COC/Samples Labels Agree	☑	☐
All Samples in Good Condition	☑	☐
Samples Received within Holding Time	☑	☐
Is there enough Volume	☑	☐
Proper Media/Container Used	☑	☐
Splitting Samples Required	☐	☑
MS/MSD	☐	☑
Trip Blanks	☐	☑
Lab to Filters	☐	☑
COC Legible	☑	☐

COC Included: (Check all included)

Client ☑ Analysis ☑ Sampler Name ☑

Project ☑ IDs ☑ Collection Date/Time ☐

All Samples Proper pH: (N/A) ☐ ☐

Additional Container Notes

*Note: West Virginia requires all samples to have their temperature taken. Note any outliers.

Qualtrax ID: 120836

Quaitrax ID: 120836

Page 2 of 2

Sample		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Soils Jars (Circle Amb/Clear)	16oz Amb/Clear																				
	8oz Amb/Clear																				
	4oz Amb/Clear	/																			
	2oz Amb/Clear																				
Ambers	1 Liter Unpreserved																				
	1 Liter HCL																				
	1 Liter Sulfuric																				
	250mL Sulfuric																				
	250mL Phosphoric																				
	250mL HCl																				
	100mL Unpreserved																				
Plastics	1 Liter Unpreserved																				
	1 Liter Sulfuric																				
	500mL Unpreserved																				
	500mL Sulfuric																				
	250mL Unpreserved																				
	250mL Trizma																				
	250mL Sulfuric																				
	250mL Nitric																				
	250mL NaOH																				
	250mL Ammonium Acetate																				
	250mL NaOH/Zinc																				
VOA Vials	Unpreserved																				
	HCl																				
	MeOH																				
	D.I. Water																				
	Bisulfate																				
Other / Fill in	Col/Bact																				

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-ELON-0001 v08_Sample Receiving Checklist
	Effective Date: 06/11/2024

DOCUMENT A00883

SPRINGFIELD WATER AND SEWER COMMISSION

MATERIAL SPECIFICATIONS

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SPRINGFIELD WATER AND SEWER COMMISSION

MATERIAL SPECIFICATIONS

Version 4 – November 1, 2020

William E. Leonard, Commissioner
Vanessa Otero, Commissioner
Daniel Rodriguez, Commissioner

Springfield Water and Sewer Commission

Material Specifications

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Material Specifications

CHAPTER 1 REVISIONS

1. Version 1 of these Material Specifications was written April 1, 2008.

2. Revisions of these Material Specifications as of June 18, 2008

3. Version 2 of these Material Specifications was written as an Interim version as of October 20, 2017. A final version will be written in 2018

4. Version 3 of these Material Specifications was written after review of the Interim Version 2 and was Finalized July 1, 2020.

5. Version 4 of these Material Specifications was written after review of the Finalized Version 3 and was Finalized November 1, 2020.

Springfield Water and Sewer Commission

Material Specifications

CHAPTER 2 GENERAL PROVISIONS

2.1.1 Reference to Specifications

These specifications may be referred to as the Commission's Specifications.

2.1.2 Severability

The provisions of these Specifications are severable. If any provision of these Specifications or any specific application to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications which can be given effect in the absence of the invalid provision or application.

2.1.3 Applicable Regulations

Every user of the public water system, private water mains, public sewer system, or private sewer mains shall be subject to regulations of the Commission, as they apply, and to any charges, rates, fees and assessments which are or may be established by the Commission. Any user of the public water system, private water mains, public sewer system, or private sewer mains shall also be subject to applicable Local, State, and Federal regulations.

2.1.4 Reference Standards

Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

1. American Concrete Institute (ACI)
2. American Iron and Steel Institute (AISI)
3. American National Standards Institute (ANSI)
4. American Society of Testing and Materials (ASTM)
5. American Water Works Association (AWWA)
6. American Welding Society (AWS)
7. Ductile iron Pipe Research Association (DIPRA)
8. Manufacturing Standardization Society of the Valve and Fittings (MSS)
9. National Fire Protection Association (NFTA)
10. NSF International (NSF)

Springfield Water and Sewer Commission

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CHAPTER 3 WATER MAINS AND APPURTANANCES,

Section 3.1 WATER PIPE – DUCTILE IRON

3.1.1 General

1. Ductile Iron Pipe provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Material Specification.

2. Ductile Iron Pipe shall be designed and manufactured in accordance with the most current ANSI A21.50/AWWA C-150 and ANSI A21.51/AWWA C-151, the latest revision and all addenda thereto.

3. Ductile Iron Pipe shall be NSF 61 certified.

4. The product(s) shall have all parts cast and assembled in North America or meet the requirements with the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

5. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product.

Springfield Water and Sewer Commission

Material Specifications

3.1.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer/vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all products to be used. All finished product(s) shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the finished product(s) showing overall dimensions,

   (b) Material specifications for each component of the finished product(s),

   (c) Coating applied to each component of the finished product(s), if applicable,

   (d) Weight of each component and total weight for each finished product(s), and

   (e) Country of origin for each component.

3. If applicable and/or in addition, the manufacturer/vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying type of coating, color of coating, manufacturer of coating, part number of the coating, and a sample on a 3-inch by 5-inch chip.

4. Certification of where product(s) is made:

   (a) If the product(s) is made in North America the manufacturer shall furnish a letter certifying the product is made in North America and signed by the Owner or President of the Company.

   (b) If the product(s) meet the requirements of AIS the manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer/vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these Material Specifications and the applicable AWWA Standard(s).

6. The manufacturer/vendor shall furnish a certified statement that all finished product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer/vendor shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the product(s) for a minimum ten (10) year time period from time of delivery.

8. The manufacturer/vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (a) Approved means the contractor can supply the material as shown on the drawing(s).

   (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.1.3 Ductile Iron Push-on Joint Water Pipe

1. Cement Lining

   (a) All pipe shall be double cement lined with an approved mortar lining and sealed with an approved asphaltic material seal coat in accordance with ANSI A21.4/AWWA C-104 of the latest revision.

   (b) Provisions of AWWA C-104, Section 4.11 relating to characteristics of asphaltic seal coat as to deleterious effect upon the quality, color, taste or odor imparted to potable water shall be strictly observed.

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2. Exterior Coating

   (a) All pipe shall have a base layer of arc-applied, 99.99% pure zinc coating, having a mass of 200g/m² and shall comply with all applicable parts of ISO 8179 for zinc coatings.

   (b) All pipe shall have a finish layer of shop-applied bituminous paint in accordance with AWWA C-151 latest the revision and shall comply with all applicable parts of ISO 8179 for zinc coatings.

3. Length

   The maximum length shall be twenty (20) feet.

4. Joints

   (a) Pipe to have push-on type joints conforming to ANSI A21.11/AWWA C-111.

   (b) Standard Styrene Butadiene Rubber (SBR) gasket shall be provided complete with lubricant. For special conditions that require gaskets other than the standard SBR gasket see the Material Specification for Special Gaskets.

   (c) Gaskets and lubricant shall be standard for the pipe used and approved by Springfield Water and Sewer Commission. Rubber gaskets and lubricant for the joints shall be shipped in bags.

   (d) The Springfield Water and Sewer Commission may require, under certain terrain conditions that restrained joints be used. The method of restraining may either, be of an locking gasket type joint, interlocking type joint, or mechanical joint restraint, as specified in Section 3.16 of these Specifications and as required by the Springfield Water and Sewer Commission.

5. Roundness

   (a) Pipe to be field cut shall be gauged full length, a mechanical joint gland shall fit over the full length of a gauged pipe.

   (b) 10% of each pipe size of each delivery shall be gauged the full length and clearly marked as gauged pipe.

6. Wedges

   Three (3) serrated bronze wedges shall be provided for each length of pipe ordered.

7. Markings

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(a) The pressure rating, metal thickness class, net weight of pipe without lining, length of pipe, date of manufacture and the name of the manufacturer shall be clearly marked on each length of pipe.

(b) Pipe to be field cut and gauged full length shall be specially marked with green ends or other marking approved by the Commission.

(c) Pipe markings shall include the word "Zinc" in the pipe markings or label required by AWWA C-151 and/or other markings as deemed appropriate by the manufacturer.

8. Pipe Class

(a) All pipe delivered shall be a minimum Thickness Class 52, unless otherwise approved by the Commission's E&TS.

(b) The Metal Thickness and Pressure Class of Ductile Iron Pipe Table below is being provided as a reference. The rated water working pressure based on AWWA C-151 standard laying condition: Type #2. Metal Thickness Class shall be as shown in following table:

Size	Thickness Class	Metal Thickness	Pressure Class	Metal Thickness
4	52	0.29	350	0.25
6	52	0.31	350	0.25
8	52	0.33	350	0.25
10	52	0.35	350	0.26
12	52	0.37	350	0.28
16	52	0.4	350	0.34
20	52	0.42	300	0.36
24	52	0.44	300	0.4
30	52	0.47	250	0.42
36	52	0.53	200	0.42
42	52	0.59	200	0.47
48	52	0.65	200	0.52
54	52	0.73	200	0.58

Note: all dimensions are in inches

9. Inspection

The Commission reserves the right to retain an outside inspection laboratory to inspect pipe at manufacturer's foundry, inspection costs to be paid by the Commission.

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3.1.4 Delivery(s)

1. Delivery shall be specified in terms of number of days from receipt of order.

2. Delivery shall be made by truck to locations designated in the Commission's service area in which include Ludlow, Springfield, Agawam, Westfield, Granville, and Blandford, all in Massachusetts.

3. When applicable, the low bidder shall notify the Commission of the quantity comprising a minimum truckload.

4. When applicable, the Commission reserves the right to mix product size to reach a full truckload.

5. The manufacturer/vendor and/or shipper must use care in preparing the product(s) for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the product(s) from damage. Damaged product(s) will not be accepted and returned to manufacturer/vendor at the manufacturer/vendor's cost.

6. The manufacturer/vendor, on request, shall provide the Commission or Installer with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these Material Specifications and the applicable AWWA Standard(s).

3.1.5 Flanged Ductile Iron Pipe

1. Flanged Ductile Iron-Pipe shall, as a minimum, shall meet all specifications in of Paragraphs 3.1.1, 3.1.2, 3.1.3, and 3.1.4 except the joints and gaskets shall be as follows:

2. Flanged Ductile Iron Pipe and Fittings provided to the Commission or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

3. Flanged Pipe shall be bid without accessories (gaskets and bolts).

    - Accessories shall be as specified in Section 3.16 of these Material Specifications.

4. Flanged Ductile Iron-Pipe, as a minimum, shall conform to the most current ANSI A21.l5/AWWA C-115 and all addenda thereto.

5. All Flanged Pipe delivered shall be a minimum Thickness Class 53, unless otherwise approved by the Commission's E&TS.

6. Flanged Ductile Iron-Pipe shall have the bolt circle and bolt holes conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.15/AWWA C-115.

7. All flanges installed on ductile iron pipe for mechanical applications shall be constructed of ASTM A536, Grade 65-45-12 ductile iron. Gray cast iron flanges shall not be allowed.

8. Flanges shall be rated for a working pressure of not less than 250-PSI.

9. Class 125 drilled flanges shall be flat-faced and have the following properties:

(a) Tensile Strength	70,000-psi
(b) Yield Stress	50,000-psi.
(c) Percent Elongation	5.0
(d) Max. Working Pressure Pipe 3-in to 18-in dia.:	350-psi
(e) Max. Working Pressure Pipe 24-in to 64-in dia.:	250-ps

3.1.6 Pipe Manufactures Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. U. S. Pipe and Foundry Co. – Tyton Joint,

2. American Ductile Iron Pipe Co. – Fastite Joint,

3. Atlantic States Pipe (McWayne, Inc.) – Tyton up to 24-inch and Fastite greater than 24-inch (gaskets are not interchange able with US Pipe or American Pipe),

4. or the Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.

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Section 3.2 Special Gaskets

1. Gaskets to be used when Volatile Organic Compounds (VOC), such as hydrocarbons, acids, vegetable oils, and petroleum products are present, shall be as follows:

   (a) Gaskets shall be VITON® - VITON® is the registered trade name for the fluoroelastomer (FKM) manufactured by DuPont. However, it is commonly used as the generic term for all FKM elastomers.

   (b) FKM gaskets shall be resistant to hydrocarbons, acids, vegetable oils, and petroleum products.

   (c) FKM gaskets shall provide permeation resistance to low molecular weight petroleum products and/or other VOC contaminants.

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Section 3.3 INSULATED PIPE AND INSULATION SYSTEMS

3.3.1 Pre-Insulated Ductile Iron Pipe

1. All Push-on Joint Insulated ductile iron water pipe as a minimum, shall meet all specifications in of Paragraphs 3.1.1, 3.1.2, 3.1.4, 3.1.4 and the following additional requirements.

2. The insulating system shall consist of 2-inch rigid foam insulation in a waterproof protective outer jacket or protective outer jacket, both to be applied at the factory.

3. Insulation shall consist of 2-inches of rigid polyurethane foam in accordance with the following:

4. The density shall be 2.2 to 3.0 lbs/ft^3 (35 to 48 kg/m^3) in accordance with ASTM D1622,

5. The water absorption shall be 4% by volume in accordance with ASTM D2842,

6. The closed cell content shall be 90% minimum in accordance with ASTM D2856,

7. The system compressive strength shall be 60 to 80 lbs/in^2 (414 to 552 kPa) in accordance with modified ASTM D1621,

8. The thermal conductivity shall have a K value of 0.14 to 0.17 Btu-in/hr-ft^2-°F (0.020 to 0.026 W/m-°C), and

9. The service range shall be -49º F to 185º F (-45º C to 85º C).

10. The water proof protective outer jacket shall for below grade installations shall be UV inhibited polyethylene and in accordance with the following, unless otherwise approved by the Commission's E&TS:

11. The sealant shall be butyl rubber and resin,

12. The minimum service temperature shall be -49º F (-45º C),

13. The minimum installation temperature shall be -30º F (-34º C),

14. The minimum thickness shall be 50 mils (1.27mm), and

15. The tensile strength shall be 38 lbs/inch-wide (6.8 kg/cm-wide) in accordance with ASTM D1000).

16. The protective outer jacket shall for above grade installations shall be galvanized steel lock seam (Spiwrap® is the registered trade name) and in accordance with the following, unless otherwise approved by the Commission's E&TS:

17. The protective outer jacket shall be factory installed, and

18. The wall thickness shall be 18-gauge, 0.051-inch (1.3mm) thick.

19. Bell and spigot joints shall be sealed using a single turn of 6-inch (150mm) wide butyl mastic tape or heat shrink wrap/closure seal.

20. Insulation kits for the mechanical joints shall be supplied and shall be pre-fabricated urethane half shells with fully bonded polymer protective coating on all exterior surfaces, including the ends and pre-rolled, form fitting, outer cover metal sheet of the same material and gauge as the pipe jacket. Kits shall be supplied silicone caulking for the seams, stainless steel attachment strips, clips, and heat shrink sleeves to seal between pipe and kits.

21. The pipe shall be insulated as shown on the drawings.

3.3.2 Insulated Pipe Manufactures Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Urecon Pre-Insulated Pipe,

2. Perma Pipe,

3. Tricon,

4. or the Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.

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Section 3.4 Field Applied Insulation Systems

3.4.1 General

1. Field Applied Insulation Systems provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Material Specification.

2. ***Insert Product Name*** shall be designed and manufactured in accordance with the most current ANSI _____/AWWA C-___ and ANSI A_____/AWWA C-___, the latest revision and all addenda thereto.

3. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (d) North America shall mean the United States, Canada, and Mexico,

   (e) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (f) Incidental parts may be purchased/obtained from other counties to provide a finished product, in accordance with these Material Specifications, and

   (g) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (h) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

4. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of product(s) or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of these Material Specifications or applicable standard, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

5. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts

installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

6. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

7. Field Applied Insulation Systems for less than 4-feet of cover, above grade, or across bridge span(s) is typically a four part system that includes the insulation sections, an insulation jacket, the seals, and/or bands.

8. Insulation jackets for above grade installations shall be aluminum, unless otherwise specified by the Commission.

9. Insulation jackets for below grade installations shall be a self-adhesive composite rubber modified asphalt with cross laminated polyethylene, known as cold insulation wrap (CI Wrap), unless otherwise specified by the Commission.

10. The above shall be supplied as follows, unless otherwise approved by the Commission's E&TS:

3.4.2 Insulation Sections

1. The insulating sections for above grade and below grade installations shall consist of 2-inch rigid foam insulation in a waterproof protective outer jacket or protective outer jacket, both to be applied at the factory.

2. Insulation shall consist of 2-inches of rigid polyurethane foam in accordance with the following:

   (a) The density shall be a minimum of 1.9 lbs/ft³ in accordance with ASTM D1622,

   (b) The water absorption shall be less than 1% by volume in accordance with ASTM C272,

(c) The closed cell content shall be 90% minimum in accordance with ASTM D6226,

(d) The system compressive strength shall be 25 to 30 lbs/in² in accordance with modified ASTM D1621,

(e) The thermal conductivity shall have a K value of 0.14 to 0.17 Btu-in/hr-ft²-°F in accordance with ASTM C518, and

(f) The service range shall be -49º F to 185º F.

3. The insulation sections shall be fabricated in half-section of 3-foot lengths. The half-sections shall fit tightly over the pipe to be insulated, except for the joint locations and the fittings where an oversized cover is made to allow for any bell joint or hardware.

3.4.3 Jacketing for Above Grade Installations

1. Insulation jackets for above grade installations shall be 0.020-inch thick aluminum with an internal moisture barrier. The aluminum shall be from alloys 3105 or 3003.

2. The internal moisture barrier shall be 3-mil polyethylene heat laminated to the inside of the metal jacket sections.

3. The aluminum jackets shall be delivered in half sections and in __-inch lengths.

3.4.4 Straps Above Grade Installations

1. Straps for above grade installations shall be soft annealed, 3/4-inch wide, 0.020-thick, 304 stainless steel.

3.4.5 Jacketing for Below Grade Installations

1. Insulation jackets for below grade installations shall be a self-adhesive composite rubber modified asphalt with cross laminated polyethylene, known as cold insulation wrap (CI Wrap).

2. The CI Wrap shall be 50-mil thick.

3. The aluminum jackets shall be delivered in standard roll sizes of 4-inch by 75-feet for the seams, fittings, and repairs and 36-inch by 75-feet for the insulation sections.

3.4.6 Field Applied Insulation Manufactures Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the

component(s) shall result in the product no longer being approved and removed from this list.

1. ITW Insulation Systems,
2. Foster Products,
3. Tricon Piping Systems, or
4. Equal provided the product(s) are manufactured as per these specifications.

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Section 3.5 POLYETHYLENE ENCASEMENT

3.5.1 General

1. Polyethylene Encasement (PE) provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. PE as a minimum shall conform to the most current American Water Works Association Standard C-105 and all addenda thereto.

3. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Produced shall mean molten polyethylene(s) formed into a sheet to create a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Manufactured shall mean sheets and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

4. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

5. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

6. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

3.5.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the gate valve showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish three (3) sets of specification(s) of each component that has the product applied identifying component surface preparation, primer (if applicable), type of component(s), color of component(s), manufacturer of component(s), part number of the component(s), and a sample on a 3-inch by 5-inch chip, if applicable.

4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AISAIS, an explanation, in the letter, of how the products meets the AISAIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

7. The manufacturer and/or vendor shall furnish a certified statement that all gate valves of the same make and model bid, regardless of the year of manufactured,

shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

8. The manufacturer and/or vendor shall furnish a warranty for the gate valves that states that the gate valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole gate valve for a minimum ten (10) year time period from time of delivery.

9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (a) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (b) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.5.3 Polyethylene Encasement

1. Polyethylene Encasement shall be V-Bio Polyethylene Encasement in full compliance with this Material Specifcation.

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2. V-Bio Polyethylene Encasement (PE) shall consist of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than eight mils in accordance with ANSI/AWWA C105/A21.5, ASTM D4976, and the following.

3. The inside surface of the V-Bio PE wrap to be in contact with the pipe exterior shall be infused with a blend of antimicrobial compound to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.

4. V-Bio PE shall be provided in tubes for water mains, bends, offsets, reducers, and other pipe shaped appurtenances, unless otherwise approved by the Commission.

5. V-BioPE shall be provided in sheets for valves, tees, crosses, and other odd shaped appurtenances, unless otherwise approved by the Commission.

6. Physical properties of finished PE film shall be:

   (a) Tensile strength 3,600 psi *

   (b) Elongation 800 percent *

   (c) Dielectric strength 800 V/mil thickness minimum

   (d) Impact Resistance 600 g minimum

   (e) Propagation Tear Resistance 2,550 grams force minimum *

   *Minimum in machine and transverse direction

7. V-Bio PE tubing and sheets shall be provided with a bright white exterior and a bright yellow interior and shall be clearly marked every two feet along its length with the following information in one-inch high letters:

   (a) Manufacturer's name or trademark

   (b) Year of Manufacture

   (c) ANSI/AWWA C105/A21.5

   (d) Minimum film thickness and material type

   (e) Applicable range of nominal pipe diameter size(s)

   (f) Warning – Corrosion Protection – Repair any damage

8. Tubes and sheets shall be provided in the following minimum sizes for the appropriate pipe sizes, unless otherwise approved by the Commission:

Polyethylene Tube and Sheet Sizes for Ductile Iron Pipe															
Pipe Diameter in inches	4	6	8	10	12	16	20	24	30	36	42	48	54	60	64
Flat Tube in inches	14	16	20	24	27	34	41	54	67	81	81	95	108	108	121
Sheet in inches	28	32	40	48	54	68	82	108	134	162	162	190	216	216	242
Rolls of 100-foot tape per 1000-feet	3	3	3	4	4	6	7	8	10	15	15	17	20	20	21

9. V-Bio PE tubing shall be supplied in the following minimum lengths, unless otherwise approved by the Commission:

   (a) Up to 16-inch diameter pipe – 300-feet long

   (b) 24-inch to 30-inch diameter pipe – 220-feet long

   (c) 30-inch to 64-inch diameter pipe – 110-feet long

10. V-Bio PE tubing shall be provided with perforations every 22-feet, unless otherwise approved by the Commission.

3.5.4 Adhesive Tape for Polyethylene Encasement

1. Adhesive tape shall be a minimum of 2-inches wide.

2. Adhesive tape shall be an anticorrosion material made of PE or polyvinyl chloride (PVC) that is 10-mil thick. Duct tape is not allowed.

3. PE or PVC adhesive tape shall have heat a laminated adhesive layer of butyl glue.

4. PE or PVC adhesive tape shall be supplied in the approximate quantities defined in the chart above.

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3.5.5 Polyethylene Encasement Manufactures Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. REPCOR Inc.,
2. T. Christy Enterprises, Inc. (Christy's),
3. Trumbull Industries, or
4. Equal provided the product(s) are manufactured as per these specifications.

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Section 3.6 GATE VALVES

3.6.1 General

1. Gate Valves provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Gate Valves as a minimum shall conform to the most current American Water Works Association Standard C-509 (full wall) or C-515 (reduced wall) and all addenda thereto.

3. Gate Valve bodies shall be of high strength ductile iron ASTM A-536 grade 65-45-12.

4. Gate Valves maximum working pressure shall be 250-PSI static pressure.

   (a) Gate Valves shall be shell tested at 500-PSI minimum with the gate in the open position.

   (b) Gate Valves shall be seat tested at 250-PSI minimum with the gate in the closed position on each side of the seat.

5. Gate Valves shall be bid without accessories (glands, gland gaskets and bolts).

   - Accessories shall be as specified in Section 3.16 of these Material Specifications.

6. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

7. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

8. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

9. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

10. Valves shall be bid without accessories (glands, gland gaskets and bolts).

11. Accessories shall be as specified in Section 3.16 of these Material Specifications.

3.6.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the gate valve showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

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3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AISAIS, an explanation, in the letter, of how the products meets the AISAIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

7. The manufacturer and/or vendor shall furnish a certified statement that all gate valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

8. The manufacturer and/or vendor shall furnish a warranty for the gate valves that states that the gate valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole gate valve for a minimum ten (10) year time period from time of delivery.

9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.6.3 Class 250B - Resilient Seated 4" - 16" Gate Valves and Tapping Valves

1. The valve body and bonnet shall be coated on all exterior and interior surfaces with fusion bonded epoxy conforming to the requirements of AWWA C-550 (most current revision) for Protective Epoxy Interior Coatings for Valves and Hydrants.

2. The valve body markings shall include the manufacturers name or mark, pressure rating, material (D.I.), and year of manufacture and be cast into the body.

3. Valves ordered under this specification will be within the following size schedules 4-inch, 6-inch, 8-inch, 10-inch, 12-inch, and 16-inch.

4. Valves to be provided with a minimum of two (2) O-ring stem seals.

5. Valves shall be of the non-rising stem (NRS) design.

6. Valves shall be wrench-nut operated with a 2-inch square-operating nut made of ductile iron and **right hand** to open.

7. Valves ordered under this Specification shall be provided with valve ends selected from the following:

    (a) Mechanical joint both ends

    - Mechanical joint bell dimensions shall conform to ANSI A21.11/AWWA C-111.

    (b) Flanged both ends

- The end flanges of flanged valves shall conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.

(c) Mechanical joint X flanged

- Mechanical joint bell dimensions shall conform to ANSI A21.11/AWWA C-111.
- The end flanges of flanged valves shall conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.

(d) Mechanical joint X tapping valve flange

- Mechanical joint bell dimensions shall conform to ANSI A21.11/AWWA C-111.
- Tapping valve flanges that form the joint with the tapping sleeve shall conform to the dimensions MSS SP-60 in sizes 4" through 12". The connecting MJ bell of the tapping valve mating with the tapping machine must be parallel and concentric with the opposite flange and concentric with the waterway to provide proper alignment for the tapping operation. This flange shall conform to the dimensions of MSS SP-113. Tapping valves provided must be manufactured to be used with the Mueller CL-12 Drilling Machine with the following shell cutter diameters 3 ½", 5 ½", 7 ½", 9 ½", and 11 ½".

8. The resilient-seat wedge shall be constructed of cast iron or ductile iron and fully encapsulated in a rubber compound for water service, constructed of STYRENE BUTADIENE RUBBER (SBR) rubber, and must meet or exceed ASTM D-2000 3 BA 715. No bare metal shall be left exposed. Wedge rubber shall be molded in place and banded tightly to the cast iron or ductile iron core and shall not be mechanically attached with screws, rivets, or similar fasteners. The wedge shall be symmetrical and seat equally well with flow in either direction.

9. The resilient-seat shall be made of an elastomer compound that complies with Section 4.2.2.7 of AWWA Standard C-515, (most current revision).

10. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

11. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

12. Valve stems and stem nuts shall be made of a copper alloy or stainless steel and the minimum yield strength shall be 40,000-PSI.

3.6.4 Class 250B - Outside-Screw-And-Yoke (OS & Y) Rising Stem

1. In addition to Paragraphs 3.6.1, 3.6.2, and 3.6.3 OS&Y valves shall meet the following requirements:

2. Valves ordered under this specification will be within the following size schedules: 3-inch, 4-inch, 6-inch, 8-inch, 10-inch and 12-inch.

3. OS&Y gate valves shall be **LEFT HAND TO OPEN**.

4. Valves shall be of the outside screw-and-yoke (OS&Y) rising stem design. Design shall be such that the stuffing box can be packed when the valve is in the fully open position and under pressure.

5. OS&Y valves shall be operated by hand wheels sized in accordance with Table 5, C-509. Hand wheel shall be of the spoke-type only. An arrow showing the direction to turn the head wheel to open the valve, with the word “OPEN” in ½” or larger letters in a break in the arrow shaft shall be cast on the rim of the hand wheel so as to be readily readable.

6. Valves ordered under this Specification shall be provided with flange valve ends on both ends. The end flanges of flanged valves shall conform to dimension and drilling in accordance with ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.

7. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall

be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

9. Valves shall be bid without accessories (companion flanges, glands, gland gaskets and bolts).

10. Accessories shall be as specified in Section 3.16 of these Material Specifications.

11. Valve stems and stem nuts shall be made of a copper alloy or stainless steel and the minimum yield strength shall be 40,000-PSI.

12. Any conflict between this paragraph and the other specified paragraphs concerning OS&Y valves then this paragraph shall govern.

3.6.5 Class 250B - 4” - 16” Valves Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. American Flow Control – Series 2500 (reduced wall),

2. Clow – Model 2638 (reduced wall) or 2640 (full wall),

3. J & S – Series 6600, 6700 (OS&Y), and 6900 (all full wall),

4. Kennedy – Series 7000 (reduced wall) or full wall special order,

5. M & H – Series 7000 (reduced wall) or 7500 (full wall),

6. Mueller – Model 2361 (reduced wall) or 2362 (full wall),

7. US Pipe – Model USP0 (reduced wall) USP1 (full wall),

8. East Jordan Iron Works – Model Flowmaster, or

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9. Equal provided the products are manufactured as per these specifications.

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Section 3.7 BUTTERFLY VALVES

3.7.1 General

1. Butterfly Valves (BV) provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

3. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at

protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

3.7.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the gate valve showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AISAIS, an explanation, in the letter, of how the products meets the AISAIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

7. The manufacturer and/or vendor shall furnish a certified statement that all butterfly valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

8. The manufacturer and/or vendor shall furnish a warranty for the butterfly valves that states that the butterfly valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole butterfly valve for a minimum ten (10) year time period from time of delivery.

9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.7.3 Class 250B - Butterfly Valves

1. All Butterfly Valves (BV) as a minimum shall conform to the most current American Water Works Association Standard C-504 and all addenda thereto.

2. All BV bodies shall be of high strength ductile iron ASTM A-536 grade 65-45-12.

3. All BV maximum working pressure shall be 250-PSI static pressure.

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4. Required shop testing, in accordance with AWWA C504:

   (a) Each Class 250B valve shall be shop tested and certified for leakage with the disc in the horizontal plane.

   - BV shall be shell tested at 500-PSI minimum with the disc in the open position.
   - BV shall be seat tested at 250-PSI minimum with the gate in the closed position on each side of the seat.

   (b) After each BV is completely assembled, including the actuator, it shall be operated several times in the factory to ensure it is in working condition.

5. All BV shall be bid without accessories (glands, gland gaskets and bolts).

   - Accessories shall be as specified in Section 3.16 of these Material Specifications.

6. All BV shall be rubber-seated, tight closing against stainless steel. BV shall be designed for direct bury service.

7. All BV body ends shall be mechanical joint conforming to ANSI A21.11/AWWA C-111, unless otherwise specified.

8. All BV shall be provided with manual actuators. All manual actuators shall be provided with a 2-inch square operating nut made of ductile iron. Manual valve actuators shall be capable of holding the disc in any position without creeping or fluttering. Manual actuators shall be serviceable without removal from the valve. A shaft seal shall be incorporated between the manual actuator and the valve.

9. All BV actuators shall be equipped with adjustable mechanical stop limiting devices to prevent over travel of the valve disc in the open and closed positions. Flow stops in the valve flow stream will not be allowed.

10. All BV manual actuators shall be of the traveling nut design rated for 450 foot-pounds of input torque against the open and closed stops. Such actuators shall be totally enclosed for buried service in a gearbox. Gears must operate in a lubricant and be totally sealed to prevent entry of dirt or liquids into the actuator.

11. Unless otherwise specified, all BV shall be right hand to open (clockwise). The operating nut shall be painted red.

12. All BV shall have an epoxy coating on the interior, exterior, and the vane. The coating shall meet all requirements of AWWA C-550 of latest revision. All bodies and vanes shall be factory coated prior to assembly and testing. All ferrous surfaces of the valve body, waterway, and vane shall receive an epoxy coating with a

minimum dry film thickness of 8-mils. All exterior surfaces shall be coated with an epoxy with a minimum of 6-mils dry film thickness. Fusion Bonded is acceptable.

13. All BV seats shall be of synthetic Nitrile (Buna-N) compound, unless otherwise specified.

14. All BV seats shall be recessed into the body and held in place with epoxy injection or attached to the disk with type 304, 316, or ASTM A564 stainless steel hardware to restrain the seats from any movement at the maximum rated flow in either direction. When the seat is attached to the disc the bolts shall pass through the seat, retainer, and disc.

15. All BV shafts shall be turned, ground, and polished and shall be constructed of Type 630/17-4 PH/ASTM A584 stainless steel and shall be sized per AWWA Standard for Rubber-seated Butterfly Valves C-504, latest revision.

16. All BV disc shall be secured to the shafts with pins. These pins shall be of the same material as the shaft and pass completely through the disc and shaft. Pins shall be tightly secured with lock-washers and nuts to ensure line vibrations cannot loosen the connection.

17. Shaft seals shall be of the chevron or O-ring type.

18. Valve bearings shall be sleeve type, corrosion resistant, and self-lubricating. Bearing load shall not exceed 20-percent of the compressible strength of the bearing or shaft materials, and shall be secured in the trunion by a machined edge. Ferrous bearings in the flow stream shall not be allowed.

19. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

20. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford,

Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

3.7.4 Butterfly Valves Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Clow – Series 4500, Style 1450-CL250,
2. DeZurik, BAW-CL250,
3. Henry Pratt Company, Model Groundhog HP-250,
4. Kennedy – Series 4500, Style 1450-CL250,
5. M & H – Series 4500, Style 1450-CL250,
6. Mueller – Model Lineseal XP,
7. Val-Matic, Series 2000-CL250, or
8. Equal provided the products are manufactured as per these specifications.

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Section 3.8 CHECK VALVES

3.8.1 General

1. Check Valves provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Check Valves as a minimum shall conform to the most current American Water Works Association Standard C-508 and all addenda thereto.

3. Working pressure 250 PSI. Test pressure 500 PSI.

4. Check Valves shall be bid without accessories (glands, gland gaskets and bolts).

    - Accessories shall be as specified in Section 3.16 of these Material Specifications.

5. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

    (a) North America shall mean the United States, Canada, and Mexico,

    (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,

    (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

    (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

    (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

6. Inspection:

    (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

    (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

7. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

8. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

3.8.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the check valve showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all check valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the check valves that states that the check valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole check valve for a minimum ten (10) year time period from time of delivery.

8. The manufacturer shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a million-cycle continuous test to demonstrate the durability of the flexible connection.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.8.3 Check Valves

1. Check Valves body and cover shall be of high strength ductile iron ASTM A-536 grade 65-45-12.

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2. Check Valves working pressure shall be 250-PSI static pressure. Check valves provided under this specification shall be shell tested at 500-PSI minimum with the flapper in the open position. Check valves provided under this specification shall seal drop tight at pressures greater than 5-PSI minimum.

3. Check valve flow area when fully open shall be not less than the area of the circle of the diameter of the nominal pipe size.

4. The check valve body and cover shall be coated on all exterior and interior surfaces with fusion bonded epoxy conforming to the requirements of AWWA C-550 (most current revision) for Protective Epoxy Interior Coatings for Valves and Hydrants.

5. The check valve body markings shall include the manufacturers name or mark, pressure rating, material (D.I.), and year of manufacture and be cast into the body.

6. Check valves ordered under this specification will be within the following size schedules 4-inch, 6-inch, 8-inch, 10-inch, and 12-inch.

7. Check valves ordered under this Specification shall be provided with flanged ends conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.

8. The check valve disc shall be constructed of ductile iron or alloy steel and fully encapsulated in a rubber compound for water service, molded, not split and glued, constructed of styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds, and must meet or exceed ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision. No bare metal shall be left exposed. Disc-rubber shall be molded in place and banded tightly to the ductile iron or steel core and shall not be mechanically attached with screws, rivets, or similar fasteners.

9. Check valve disc travel shall not be more than 35-degrees for full open position.

10. Bronze seat rings are not allowed. Disc shall be the only moveable part. No o-rings or other bearings are allows.

11. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

12. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

13. Valves shall be bid without accessories (glands, gland gaskets and bolts).

14. Accessories shall be as specified in Section 3.16 of these Material Specifications.

3.8.4 Check Valves Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. American Flow Control: Series 2100 - RSCV1,

2. Val-matic: Series 500A – VMC502A,

3. Henry Pratt Company: RD-Series Flex-0205,

4. Milliken Valve Company; Series 850 – Figure 851, or

5. Equal provided the products are manufactured as per these specifications.

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Section 3.9 AIR VALVE ASSEMBLIES AND AIR CORPORATIONS

3.9.1 General

1. Air Valve Assemblies and Air Corporations provided to the Commission or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Brass components of the Air Valve Assemblies may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5% zinc (brass 85-5-5-5).

3. Copper tube components of the Air Valve Assemblies shall be type "L", manufactured in America.

4. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

5. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

6. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

7. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.

8. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

3.9.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the corporation and curb stop showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all products shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the product that states that the products shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole check valve for a minimum ten (10) year time period from time of delivery.

8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (a) Approved means the contractor can supply the material as shown on the drawing(s).

   (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.9.3 Standard Air Valve Assembly

1. One–inch or Two-inch corporations: may be brass 85-5-5-5, tapered inlet ball corporation with One-inch or Two-inch CC thread on the inlet side and One-inch or Two-inch female IP thread on the outlet side. One is required for each assembly.

2. Corporations may rotate 360 degrees in either direction or rotate ¼ turn only and **OPEN LEFT,** counter-clockwise.

3. One-inch or Two-inch 90-degree elbows: may be brass 85-5-5-5, female on both ends with One-inch or Two-inch IP thread. Three are required for each assembly.

4. One-inch or Two-inch Ball Valve Curb Stop and Waste: may be brass 85-5-5-5, ball valve type with One-inch or Two-inch female IP thread on both ends. A tee head A stop & waste hole shall be provided. One is required for each assembly.

5. Curb Stops shall rotate ¼ turn only and **OPEN LEFT,** counter-clockwise.

6. One-inch and/or Two-inch Nip: may be brass 85-5-5-5, male on both ends with One-inch or Two-inch IP thread. Minimum length shall be six-inches and maximum length shall be twelve-inches, unless otherwise approved by the Commission. Three are required for each assembly.

7. One-inch or Two-inch Riser pipe: may be brass 85-5-5-5, male on both ends with One-inch or Two-inch IP thread. The length shall be from the last 90-degree elbow to four-to-six-inches below finished roadway. One is required for each assembly.

8. One-inch or Two-inch cap: may be brass 85-5-5-5, One-inch or Two-inch female IP thread. One is required for each assembly.

3.9.4 One-Piece Air Valve Assembly

1. The One-Piece Air Valve shall be of a type equal to Wedge Manufacturing, L.L.C., catalog numbers 10060 for 1-inch and 20060 for 2-inch, or an approved equal.

2. One-inch or two-inch corporations: may be brass 85-5-5-5, tapered inlet ball corporation with One-inch or Two-inch CC thread on the inlet side and One-inch or Two-inch male IP thread on the outlet side. One is required for each assembly.

3. Corporations may rotate 360 degrees in either direction or rotate ¼ turn only and **OPEN LEFT,** counter-clockwise.

4. One-Piece Air Valves shall be provided with a lower operating lever made of cast or stamped brass that is secured to the brass ball valve with a marine type brass cotter pin.

5. One-Piece Air Valves shall be provided with a brass ball valve with female iron pipe threads at both ends. The ball valves shall be drilled on the riser side for drainage.

6. One-Piece Air Valves shall be provided with an adapter at both ends made of copper. The adapters shall have male threads on one end and plain on the other for crimp fitting.

7. One-Piece Air Valves shall be provided with a copper riser pipe. The Riser pipe shall be crimp fit to the copper adapters at both ends.

8. One-Piece Air Valves shall be provided with a tee handle made of cast brass. The tee handle shall be secured to the operating rod with stainless steel roll pin.

9. One-Piece Air Valves shall be provided with an operating rod made of 3/8-inch diameter brass CDA 360, ASTM B-16.

10. One-Piece Air Valves shall be provided with a split ring connector that shall secure the operating rod to the riser. The fasteners shall be stainless steel.

11. One-Piece Air Valves shall be provided with a lower mechanism that connects the operating rod to the lower operating lever. The lower mechanism shall be secured to the operating rod with a stainless steel roll pin. The lower mechanism shall be secured to the lower operating lever with a 3/8-inch X ½-inch stainless steel bolt with a Nylock safety nut.

3.9.5 Air Corporations

1. Air corporations shall be one-inch.

2. Tapered inlet ball type corporations, may be brass 85-5-5-5, shall be with one-inch CC thread on the inlet side, and one-inch male IP thread on the outlet side.

3. Corporations may rotate 360 degrees in either direction or rotate ¼ turn only and **OPEN LEFT,** counter-clockwise.

4. Air corporations shall be provided with a 1-inch female IP threaded brass cap, unless otherwise approved by the Commission.

3.9.6 Air Valve Assembly Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

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1. Tapered inlet ball type corporations with one-inch or two-inch CC thread on the inlet side and one-inch or two-inch female IP thread on the outlet side

	1-inch	2-inch
(a) Ford:	FB1600-4	FB1600-7
(b) Red Hed:	Not Available (NA)	RHB43875
(c) Mueller:	B-20045 (state size)	B-20045 (state size)
(d) McDonald:		
(e) Cambridge:		

2. Ball Valve Curb with Stop and Waste and with One-inch or Two-inch female IP thread on both ends

	1-inch	2-inch
(a) Ford:	B11-444SW	B11-777SW
(b) Red Hed:	RHB22202	RHB22205
(c) Mueller:	B-20283 (state size)	
(d) McDonald:		
(e) Cambridge:		

3.9.7 Air Corporation Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Tapered inlet ball type corporations with one-inch CC thread on the inlet side and one-inch male IP thread on the outlet side

(a) Ford:	FB800-4
(b) Red Hed:	RH43842
(c) Mueller:	B-2996 (state size)
(d) McDonald:	

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(e) Cambridge:

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Section 3.10 VALVE BOXES

3.10.1 General

1. Valve Boxes provided to the Commission or installer shall be telescopic in design, Cast Iron, heavy pattern, adjustable type top section, bottom section, and cover and manufactured, tested, inspected and delivered in full compliance with this Specification.

2. The valve boxes shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements.

3. Valve boxes shall be strong, durable, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

   (a) An HS20 load rating is required.

   (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.

   (c) Valve boxes covers and seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.

4. The Commission may require valve boxes be subjected to proof load testing as follows:

   (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards – Proof Load Testing (PLT).

   (b) The PLT shall show no detrimental deformation or cracks when a proof load of 25,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

   (c) Permanent deformation shall not exceed 1/8-inch.

   (d) All testing shall be at the supplier's expense.

5. Valve boxes top sections, bottom sections, covers, and enlarged bases shall be provided with individual permanent markings that are easily discernable and show the following:

   (a) Name of the producing foundry and country of manufacture preceded by the words "Made in", such as "Made in USA"

   (b) AASHTO designation or ASTM designation number

(c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,

(d) Heat identification and cast date (MM/DD/YY),

(e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

6. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.

7. All valve boxes tops, bottoms, and covers shall be coated with an approved petroleum asphaltic seal coat.

8. The manufacturer/vendor/shipper must use care in preparing valves boxes for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged product(s) will not be accepted.

9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

3.10.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

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2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the product(s) showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product(s) meet all the requirements of the AIS, an explanation, in the letter, of how the product(s) meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole product(s) for a minimum one (1) year time period from time of delivery.

8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements, American Society of Testing and Materials (ASTM) A48, Class 35B, and as the Commission may require the National Institute of Standards Technology (NIST) standards – Proof Load Testing.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.10.3 Two Piece Valve Boxes

1. In addition to the General Section above the following shall be provided:

2. The total weight of the valve box assembly (top, cover and bottom sections) shall be 105 pounds minimum.

3. Valve boxes shall be of lengths adapted to five-feet of pipe cover or more and have a minimum of six-inches of overlap in the most extended position

4. The top section shall have:

   (a) A top flange to increase the stability of the box to remain at the present height

   (b) A smooth cast seat to accept the lid and insure a non-rocking installation.

   (c) The top section shall be 24-inches to 27-inches long and weigh a minimum of 40-pounds.

5. The bottom section shall have:

(a) A belled base and have an inside diameter of 5-¼”

(b) The belled base shall enclose the valve, the valve stuffing box / seal plate, and operating nut.

(c) A bottom flange of sufficient bearing area to prevent settling.

(d) The bottom section shall be 36-inches to 40-inches long and weigh a minimum of 45-pounds.

3.10.4 Three Piece Valve Boxes

1. In addition to the General Section above the following shall be provided:
2. The total weight of the valve box assembly (top, cover, bottom, and base sections) shall be 145 pounds minimum.
3. Valve boxes shall be of lengths adapted to five-feet of pipe cover or more and have a minimum of six-inches of overlap in the most extended position
4. The top section shall have:

   (a) A top flange to increase the stability of the box to remain at the present height.

   (b) A smooth cast seat to accept the lid and insure a non-rocking installation.
5. The bottom section shall have:

   (a) A belled base and have an inside diameter of 5-¼”.

   (b) A bottom flange of sufficient bearing that will fit onto a number six base.
6. The number six base section shall have:

   (a) At the top opening a minimum inside diameter of 5-¼”.

   (b) The belled base shall enclose the air valve assembly and allow the lever to operate freely.

   (c) A bottom flange of sufficient bearing area to prevent settling.

3.10.5 Valve Box Cover

1. In addition to the General Section above the following shall be provided:
2. The valve box cover shall have:

(a) A 7-5/16-inch diameter with a 2-inch thick lid and a 1-1/2-inch deep skirt. The overall height shall be 3-1/2-inches.

(b) The valve box cover shall weigh no less than 13 pounds

(c) The valve box cover shall have the word "Water" cast in the top.

(d) The valve box cover shall be designed to remain seated when subjected to mobile traffic conditions.

(e) The valve box cover shall be close fitting and substantially dirt tight and flush with the top of the box rim.

3.10.6 Valve Box Riser(s)

1. In addition to the General Section above the following shall be provided:
2. The valve box riser(s) shall be either fixed or slide type.
3. Valve box riser(s) shall be provided the following lengths:

   (a) 1-inches – fixed

   (b) 1-1/2- inches – fixed

   (c) 2- inches – fixed

   (d) 3-inches – fixed

   (e) 4-inches – fixed

   (f) 6-inches – slide

   (g) 10-inches to 12inches – slide

   (h) 13-inches to 18-inches - slide

4. A top flange to increase the stability of the box to remain at the present height.
5. A smooth cast seat to accept a standard valve box cover and insure a non-rocking installation.
6. The lower portion of valve box extension shall be, at most, 5-3/4-inch in diameter in order to fit inside the top section of an existing gate box.

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3.10.7 Valve Boxes Manufacturers and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Bibby Ste-Croix

   (a) Valve box complete: V683 (5664S)

   (b) Top section only: V747

   (c) Bottom section only: 7354

   (d) Cover: V878

   (e) 1-inch fixed riser: V829

   (f) 1-1/2-inches fixed riser: V830

   (g) 2-inch fixed riser: V831

   (h) 3-inch fixed riser: V832

   (i) 4-inch fixed riser: V833

   (j) 6-inch slide riser: V856

   (k) 10-inch to 14-inch slide riser: V858

   (l) 15-inch to 24-inch slide riser: V862

   (m)#6 enlarged base: 7341,

2. Bingham and Taylor –

   (a) Valve box complete: 5664-S (Fig. 4908)

   (b) Top section only: 56-S

   (c) Bottom section only: 64-S

   (d) Cover: 4905-L1.5

   (e) 1-inch fixed riser: 6016-B and specify raise desired

(f) 1-1/2-inches fixed riser: 6016-B and specify raise desired

(g) 2-inch fixed riser; 6016-B and specify raise desired

(h) 3-inch fixed riser: 6016-B and specify raise desired

(i) 4-inch fixed riser: 6016-B and specify raise desired

(j) 6-inch slide riser: NA (use item k)

(k) 10-inch to 14-inch slide riser: 6020 and specify raise desired (10-1/2-inches)

(l) 15-inch to 24-inch slide riser: 6020 and specify raise desired (15-inches)

(m) #6 enlarged base: 4909-A,

3. East Jordan Iron Works –

(a) Valve box complete: 85553960 (664-A)

(b) Top section only: _____

(c) Bottom section only: _____

(d) Cover: 6800 (2-inch skirt)

(e) 1-inch fixed riser: 8500010

(f) 1-1/2-inches fixed riser: 850002015

(g) 2-inch fixed riser; 8500020

(h) 3-inch fixed riser: 8500030

(i) 4-inch fixed riser: 8500040

(j) 6-inch slide riser: NA (use item l)

(k) 10-inch to 14-inch slide riser: NA (use item l)

(l) 15-inch to 24-inch slide riser: 855558009 (#69) (16-1/2-inches)

(m) (#6) enlarged base: 85605006, or

4. Equal provided the products are manufactured as per these specifications.

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Section 3.11 HYDRANTS – DRY BARREL

3.11.1 Public Hydrants

3.11.2 General

1. Hydrants provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Hydrants as a minimum shall conform to the most current American Water Works Association Standard C-502 and all addenda thereto.

3. Working pressure 250 PSI. Test pressure 500 PSI.

4. Hydrant shall open RIGHT (clockwise).

5. The direction to open shall be cast with an indicating arrow and "OPEN" into the operating nut and weather shield or into the bonnet and shall be clearly visible when viewed from the top.

6. Hydrants shall be for 5-feet-0-inch, 5-feet-6-inch, 6-feet-0-inch, and 6-feet-6-inch bury. The standard depth of bury is 6-feet-0-inch, unless otherwise specified by the Commission (See delivery requirements, below). Depth of bury shall be painted on the lower barrel section of the hydrant.

7. Hydrant shall be of the full compression design, opening against and closing with the water pressure.

8. All internal parts shall be designed for rapid and simple removal employing a compact lightweight wrench that will withdraw all working parts from the base of the hydrant as a unit.

    - The design and construction of the hydrant shall be such that a Commission maintenance and repair crew can fully disassemble the hydrant from the frangible coupling in no more than one (1) hour.

9. Hydrants shall be bid without accessories (glands, gland gaskets and bolts).

    - Accessories shall be as specified in Section 3.16 of these Material Specifications.

10. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

    (a) North America shall mean the United States, Canada, and Mexico,

(b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

(c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

(d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

11. Inspection:

(a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

(b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the hydrants.

12. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

13. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

14. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

3.11.3 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

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2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the hydrant showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight for each bury depth, and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all hydrants of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the hydrants that states that the hydrants shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole hydrant for a minimum ten (10) year time period from time of delivery. The manufacturer shall repaint, recoat hydrants, or replace hydrant or hydrant parts that exhibit coating failure, such as rusting, chipping, flaking, under normal condition and from handling during delivery for a minimum three (3) year time period from time of delivery. Coating failures caused by Installer will not be a cause of coating failure.

8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed hydrant have been made, and the results of all tests conform to the requirements of the American Water Works Association

Standard Specification C-502. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.11.4 Bonnet

1. The bonnet shall be one piece and made of high strength cast iron ASTM A-126 Class B or of high strength ductile iron ASTM A-536 grade 65-45-12.

2. The bonnet shall be free draining.

3. The bonnet shall be designed to make tampering difficult and provide a convenient means for lubricating.

3.11.5 Barrel Sections

1. The barrel sections shall be one piece and made of high strength cast iron ASTM A-126 Class B or of high strength ductile iron ASTM A-536 grade 65-45-12.

2. The lower barrel shall be provided with a bury line painted or embossed onto it.

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3. The upper and lower barrel joint shall be no less than 2-inches above the bury line.

4. The upper barrel nozzles shall be "three (3) way" and as follows:

   (a) The upper barrel shall be equipped with (2) two each 2-1/2-inch hose nozzles, 180 degrees apart.

   (b) The upper barrel be equipped with one (1) each 4-1/2-inch pumper nozzle on the same plane and in between the 2-1/2-inch hose nozzles.

   (c) The location of the center line of the upper barrel nozzles shall be at least 16-inches above the bury line so that a 15-inch wrench can freely turn 360-degrees without hitting the ground.

5. Changes in shape or size of the barrel sections shall be curved. The junction of the hose and pumper outlets shall be rounded.

6. The upper and lower barrel joint shall be connected with a traffic safety flange.

   (a) The traffic safety flange shall be designed so that in the event of accident, damage, or breaking of the hydrant above or near the ground line the main valve will remain closed.

   (b) The traffic safety flange shall be of the split flange, split coupling type, or lock ring designed to permit 360-degree rotary movement of the upper barrel without shutting down service or removing the flange bolt

   (c) The traffic safety flange may be high strength cast iron ASTM A-126 Class B or of high strength ductile iron ASTM A-536 grade 65-45-12 or other approved material designed so that in the event of accident, damage, or breaking of the hydrant above or near the ground line the main valve will remain closed.

   (d) Break-away bolts, break-away barrel, lugs or individual metal keeper devices are not acceptable.

7. Hydrants shall be provided with permanent markings cast or stamped, mechanical or adhesive attachment shall not be acceptable, that are easily discernable (at least ½-inch to 1-inch tall) after the hydrant is installed (characters in parentheses are examples of permanent markings) that include the following:

   (a) Identity of manufacturer by name, initials, insignia, or abbreviations commonly in use,

   (b) Size of main valve opening (5-1/4"),

   (c) Material the barrels are made of (DI or CI),

(d) Year of manufacture (2010),

(e) Pressure rating (250 PSI), and

(f) Underwriters Laboratory Listed (UL).

3.11.6 Outlet Nozzles

1. Hydrant outlet nozzles shall be bronze and fastened into the nozzle section of the upper barrel by a mechanical means.

   (a) Screwed in outlet nozzles shall be provided with a lock pin/screw to prevent the outlet nozzle from backing out, or;

   (b) Recessed lug & groove outlet nozzles shall be provided with a threaded retainer or lock pin/screw to prevent outlet nozzle from backing out.

   (c) Hydrant outlet nozzles shall not have any movement when locked into place.

   (d) Caulking the outlet nozzle into the upper barrel shall not be allowed.

2. Hydrant outlet nozzles shall have National Fire Protection Association (NFPA) Number 194 National (American) Standard Fire Hose Coupling Screw Threads.

3.11.7 Outlet Nozzle Caps

1. Outlet nozzle caps shall be made of high strength Cast Iron ASTM 126A Class B

2. Outlet nozzle caps shall have National Fire Protection Association (NFPA) Number 194 National (American) Standard Fire Hose Coupling Screw Threads.

3. Nozzle caps shall be provided with 1-1/8" (point to flat) pentagon and shall be not less than 1" high.

4. All nozzle caps shall be provided with a metal slip ring attached to the nozzle cap and metal chains connected to the slip ring and hydrant barrel. The chain (slip) ring and chains shall allow the nozzle caps to rotate freely.

   (a) The chain (slip) ring shall not be less than ¼-inch diameter steel.

   (b) The chain shall be non-kink double/twisted loop steel and shall not be less than 3/16-inch diameter. Each link shall be approximately 1-1/2-inches long. Each chain shall have at least eleven (11) links.

   (c) The slip ring and chain shall be rust proof coated or plated or stainless steel.

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3.11.8 Operating Mechanism

1. Operating nut shall be made of high strength ductile iron ASTM A-536 grade 65-45-12 or bronze

   (a) 1-1/8" (point to flat) pentagon and shall be not less than 1" high.

   (b) Operating nut may function as both an operating nut and weather-shield.

   (c) The operating mechanism may be sealed with a rubber weather-shield or O-ring seal.

2. The design and construction of the hydrant operating mechanism of the hydrant shall be such that one (1) person shall be able to open and close the hydrant under a maximum operating pressure of 250-PSI with a 15-inch wrench.

3. The design and construction of the hydrant operating mechanism located at the top of the hydrant shall be such that no part of the operating threads will be in contact with water in the upper barrel (standpipe) when the hydrant is in service.

   (a) The working threaded parts of the operating mechanism shall not have any steel or iron parts against steel or iron parts. The threaded portion of the operating stem or the stem nut (or sleeve) shall be made of bronze or stainless steel.

   (b) Details and materials for the dry-top construction shall be subject to the approval of the Commission.

4. Hydrant operating mechanism assembly shall be housed in a compact housing with an integral lubrication chamber.

   (a) Two (2) O-rings shall be provided to seal the lubrication chamber from water in the hydrant barrel from entering the lubricating chamber under pressure.

   (b) An additional O-ring shall be used in the hold down nut to prevent dirt, condensation or atmospheric contamination entering the lubrication chamber from outside.

   (c) The moving surface against which these two "O"-rings bear upon to create the seal must be of bronze or stainless steel.

5. A travel stop nut or similar device may, but is not required, be used to limit main valve travel and to prevent putting main stem into over compression.

6. The upper operating assembly shall be compatible with the "Custodian" vandal proof device as manufactured by Hydra-Shield Manufacturing, Inc. The

"Custodian" device must be able to be installed without further machining or modification to the hydrant.

7. The upper and lower operating rods may be made of cold roll steel (CRS), hot rolled steel (HRS), stainless steel (SS), or other material approved by the Commission. The lower operating rod shall not protrude past the lower barrel

8. The operating rods shall be connected with frangible coupling designed so that in the event of accident, damage, or breaking of the hydrant above or near the ground line the main valve will remain closed.

   (a) The frangible coupling shall be held in place to the operating rods with at least one (1) stainless steel pin or bolt in each rod.

   (b) Details and materials for the frangible connections shall be subject to the approval of the Commission.

3.11.9 Main Valve Assembly

1. Hydrant valve opening 5-1/4" minimum as sized by seat ring internal opening.

2. The hydrant main valve may be either three (3) piece design or one (1) piece design, as follows:

3. Three (3) piece design includes a top plate, main valve, and bottom plate:

   (a) The valve top plate may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, bronze, or other material approved by the Commission.

   (b) The valve bottom plate may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, bronze, or other material approved by the Commission.

   (c) The valve bottom plate shall be fully epoxy coated by a fusion or thermal bonding in accordance with AWWA C-550. Bronze or stainless steel valve bottom plates do not require epoxy coating.

   (d) The main valve may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, bronze, or other material approved by the Commission fully encapsulated in a rubber compound for water service, molded, not split and glued, constructed of styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds, and must meet or exceed ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision. No bare metal shall be left exposed.

4. One (1) piece design is a single piece:

   (a) The main valve may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, steel, or other material approved by the Commission.

   (b) The main valve shall be fully encapsulated in a rubber compound for water service, molded, not split and glued, constructed of ethylene propylene diene Monomer (EPDM) rubber in accordance with ASTM standard D-1418, styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds in accordance with ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision. No bare metal shall be left exposed.

5. The main valve assembly shall have a bronze sub-seat and a bronze seat ring.

6. The mechanically installed sub-seat of the hydrant shall be constructed of bronze, and be an integral part of the bottom shoe/elbow.

   - The sub-seat shall be mechanically installed with threads, lock rings, or other Commission approved method.

7. The seat ring shall also be of bronze and shall be a working component of the main valve assembly.

8. Seal between seating and sub-seat shall consist of “o” rings located in machined grooves, above and below the drainage channel.

9. There shall be a minimum of two (2) drain ports one hundred and eighty-degrees apart. The drain ports shall be provided in the bottom barrel, bottom shoe/elbow, or between the bottom barrel and bottom shoe/elbow.

10. All "O" rings shall seal against bronze.

3.11.10Bottom Shoe/Elbow

1. The bottom shoe/elbow shall be made of high strength ductile iron ASTM A-536 grade 65-45-12.

2. The bottom shoe/elbow shall be provided with flat cast bottom to set the hydrant on.

3. The bottom shoe/elbow shall be provided with 6-inch mechanical joint connection in accordance with ANSI/AWWA C111/A21.11.

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3.11.11Coatings

1. Coatings require proper surface preparation in order for the coating systems to adhere to the component being coated. At a minimum the components shall be mechanically blast cleaned and/or immersed in a chemical cleaner or heat cleaned in a furnace in order to insure a properly prepared surface that is clean and clear of any grease, oil, dirt, etc., in accordance with AWWA C502 and C-550, latest versions.

2. The bonnet shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or electrodesposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior (excluding lubricating chamber) and exterior of the bonnet.

   (a) The color shall be a gloss aluminum/silver in accordance with Federal Standard 595 Paint Specification FS 17178.

   (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.

3. The upper barrel shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or an electrodesposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the upper barrel.

   (a) The color shall be gloss blue angels yellow in accordance with Federal Standard 595 Paint Specification FS 13655 or RBG Hex Code FDD31D.

   (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.

4. The lower barrel may be covered with two (2) coats of asphaltic tar coatings, the first being allowed to dry before the second is applied or may be fully epoxy coated by a fusion or thermal bonding or coated in accordance with AWWA C-502 and C-550, latest version, and shall be applied to the interior and exterior of the lower barrel.

5. The nozzle caps shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or a epoxy wet or electrodesposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the nozzle caps.

(a) The color shall be a gloss aluminum/silver in accordance with Federal Standard 595 Paint Specification FS 17178.

(b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.

6. The bottom shoe/elbow shall be fully epoxy coated by a fusion or thermal bonding in accordance with AWWA C-502 and C-550 and shall be applied to the interior and exterior of the bottom shoe/elbow.

3.11.12 Manuals, Spare Parts, Tools, Touch-up Paint, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.

2. The manufacturer shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the hydrant components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.

3. The manufacturer shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.

4. The manufacturer shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of hydrants.

5. The manufacturer shall provide two (2) quarts of touch-paint or coating that is compatible with the factory applied coating with the first delivery.

6. The manufacturer shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.

7. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.

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3.11.13Miscellaneous

1. All fasteners, excluding joint accessories, installed below the ground line shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

2. All fasteners installed above the ground line shall be made of medium carbon steel and supplied with a rust proof coating. Bolts shall of medium carbon steel, per ASTM A193, grade B7. Nuts shall be heavy hex nuts made of medium carbon steel, ASTM A194, grade 2H. All bolts and nuts shall be Unified National Coarse (UNC) rolled thread. Bolts installed into castings shall be provided with one (1) medium carbon steel flat washer and nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged. All the medium carbon steel bolts, nuts, and washers installed above the ground line shall be rust proof coated or plated. Nuts and/or bolts shall be provided with two (2) Grade B steel flat washers so that the epoxy coating is not damaged.

3. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

4. The exterior design of the bonnet and upper barrel shall be of the “traditional design” and must meet and be subject to the approval of the Commission’s aesthetic judgment.

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3.11.14 Hydrant Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. American Flow Control – B-84-B-5,
2. AVK – 2780,
3. Clow – Medallion – F2545,
4. Kennedy - Guardian – K81,
5. M & H – 6129,
6. Mueller – Super Centurion,
7. U.S. Pipe - Metropolitan 250 – Model M-94,
8. East Jordan Iron Works – Watermaster 5CD250, or
9. Equal provided the Hydrants are manufactured as per these specifications.

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3.11.15Private Hydrants installed after a Back Flow Prevention Device

1. In addition to the Material Specifications for Public Hydrants Section 3.11.1 Private Hydrants installed after a back flow prevention device shall meet the following requirements:

2. Private Hydrants installed after a Back Flow Prevention Device shall be "two (2) way" and as follows:

   (a) The upper barrel shall be equipped with (2) two each 2-1/2-inch hose nozzles, no greater than 180 degrees apart.

   (b) The location of the center line of the upper barrel nozzles shall be at least 16-inches above the bury line so that a 15-inch wrench can freely turn 360-degrees without hitting the ground.

3. The upper barrel shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or electro-disposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the upper barrel.

   (a) The color shall be gloss red in accordance with Federal Standard 595 Paint Specification FS 11105 or RBG Hex Code B51F11.

   (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.

4. The rest of the components shall be coated as required in Section 3.11.11 of these Material Specifications.

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3.11.16Private Hydrants installed before a Back Flow Prevention Device

1. In addition to the Material Specifications for Public Hydrants Section 3.11.1 Private Hydrants installed before a back flow prevention device shall meet the following requirements:

2. The upper barrel shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or electro-disposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the upper barrel.

   (a) The color shall be gloss red in accordance with Federal Standard 595 Paint Specification FS 11105 or RBG Hex Code B51F11.

   (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.

3. The rest of the components shall be coated as required in Section 3.11.11 of these Material Specifications.

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3.11.17Vandal Proof Device for Operating Fire Hydrants

1. Vandal Proof Device for Operating Fire Hydrants provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Device Description

   (a) A vandal proof device (Trade Name "Custodian") to prevent unauthorized use of fire hydrants. The device shall readily attach to the existing fire hydrant housing or opening mechanism. Materials shall be strong enough to withstand acts of vandalism and weather extremes and still provide smooth fire hydrant operation. The device shall be unique in that only a special magnetic wrench can open or close the fire hydrant.

   (b) The vandal proof device shall be made to be installed on any hydrant in the Springfield Water and Sewer Commission's Service Area..

   (c) The vandal proof device shall be made to order, for specific makes and models of hydrants.

3. Device Construction

   An inner barrel constructed of high tensile manganese bronze shall be designed to fit over the existing fire hydrant operating nuts. An outer housing constructed of stainless steel shall be installed over the inner barrel so as to swivel freely until a special key wrench is used. Attachment of the outer housing shall be a special snap ring groove designed to withstand repeated blows by a sledge hammer without shearing.

4. Device Mating Collar

   A mating collar shall be installed between the outer housing fire hydrant top for a weather seal and to prevent removal of the swivel housing by pry bars or other tools available to vandals. The mating collar shall extend up the sides of the swivel housing and to a height sufficient to provide added protection of the hydrant operating nut and to withstand repeated blows by sledge without failing.

5. Device Operating Wrench

   A special magnetic operating wrench shall be constructed of an aluminum-magnesium alloy with handles extending from both sides for easy operation. The wrench shall incorporate a unique permanent magnet which will engage an activator located inside the outer housing. The magnet's inductive magnet can engage the activator. Performance must not be affected by local environment

temperature ranges or weather conditions. The special key wrench shall be the only means of opening or closing the hydrant. As an added convenience, the opposite side of the wrench shall contain a conventional 1-1/8" pentagon recess that will work on standard hydrant nuts.

6. The manufacturer/vendor/shipper must use care in preparing the vandal proof device for shipment and in handling during shipment and delivery, to insure that the vandal proof devices are delivered without damage. Damaged vandal proof devices will not be accepted.

7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the vandal proof device and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

8. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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3.11.18Diffusers for Fire Hydrants

1. Fire Hydrant Diffusers shall be provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Fire Hydrant Diffusers shall be for use with chemically treated (4 ppm or less chlorine/chloramine) potable water.

3. Fire Hydrant Diffusers shall be provided with 2-1/2-inch NPT Coupling that accepts any 2-1/2" NPT Male Iron Pipe Adapter.

4. Fire Hydrant Diffusers shall be 18-inches in length x 8-inches x 8-inches at the discharge

5. Fire Hydrant Diffusers shall weight 33-pounds.

6. Fire Hydrant Diffusers shall be used with 81% Sodium Sulfite tablets

7. Fire Hydrant Diffusers shall have an eleven (11) Tablet Capacity and use approximately one (1) Tablet per 2,500-gallons.

8. Fire Hydrant Diffusers shall be as currently manufactured by Pollardwater – Model LPD-250, or equal provided the Fire Hydrant Diffusers are manufactured as per these specifications.

9. The manufacturer/vendor/shipper must use care in preparing the above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Damaged vandal proof devices will not be accepted.

10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

11. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

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(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product.

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3.11.19Private Yard Hydrant

1. Private Yard Hydrants provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Formed shall mean metals rolled or pressed or machined to create a finished product,

   (d) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

3. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished products.

4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the

finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

7. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

8. The manufacturer and/or vendor shall furnish three (3) sets of 8-1/2-inch by 11-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the fittings showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Rated working pressure and hydrostatic test pressure of each finished product(s), and

   (e) Country of origin for each component.

9. The manufacturer at the Commission's request shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

10. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

11. The manufacturer shall furnish a warranty for the finished Fittings that states that the Fittings shall be free from all defects in material and workmanship and from handling during delivery under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole coupling for a minimum one (1) year time period from time of delivery. Coating failures caused by Installer will not be a cause of coating failure

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12. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed Fittings have been made, and the results of all tests conform to the requirements of the appropriate ANSI/AWWA standard.

13. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

14. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

15. Private Yard Hydrants shall be non-freezing type and provided so as to be self-draining and a depth of bury of 5-feet 6-inches minimum.

16. Private Yard Hydrants will be furnished with a 2" female iron pipe (FIP) inlet and a 2-1/2" national standard thread (NST) outlet.

17. Private Yard Hydrants shall have a non-turning operating rod and shall open to the left.

18. Private Yard Hydrants shall be painted red.

19. All working parts of Private Yard Hydrants shall be bronze to bronze design and be serviceable from above grade with no digging.

20. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for

interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

(a) Kupferle – #80WD, or

(b) Equal provided the products are manufactured as per these specifications.

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Material Specifications

Section 3.12 FITTINGS

3.12.1 General

1. Fittings provided to the Springfield Water and Sewer Commission (Commission) or its Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Fittings shall be cast from of high strength ductile iron conforming to ASTM A-536 grade 70-50-05. The minimum tensile strength shall be 70,000-PSI, the minimum yield strength shall be 50,000-PSI, and the minimum elongation shall be 5%.

3. Fittings shall be NSF 61 certified.

4. Working Pressure:

   (a) 4-inch though 24-inch shall be rated at 350-PSI. Test pressure shall be three (3) times the rated working pressure (1050-PSI).

   (b) 30-inch though 48-inch shall be rated at 250-PSI. Test pressure shall be three (3) times the rated working pressure (750-PSI).

   (c) 54-inch though 64-inch shall be rated at 150-PSI. Test pressure shall be three (3) times the rated working pressure (450-PSI).

5. Joints of Fittings:

   (a) Fittings shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified by the Springfield Water and Sewer Commission (Commission).

   (b) Ductile Iron fittings with restrained mechanical joint, flange, plain end, or combination thereof may be allowed in accordance with appropriate ANSI/AWWA standard and as specified by Commission.

   (c) The bolt holes shall be equal spaced and straddle the pipe center line.

   (d) Push-on (Tyton), type joints are not acceptable.

6. Ductile Iron Fittings shall be interior lined and exterior coated as follows:

   (a) All Fittings shall be lined with an double cement mortar lining and sealed (over the mortar lining) and with an approved asphaltic material seal coat in accordance with ANSI A21.4/AWWA C-104 of the latest revision.

(b) Provisions of ANSI A21.4/AWWA C-104, Section 4.11 relating to characteristics of asphaltic seal coat as to deleterious effect upon the quality, color, taste or odor imparted to potable water shall be strictly observed.

(c) The exterior coating all Fittings shall have a base layer of arc-applied, 99.99% pure zinc coating, having a mass of 200g/m² and shall comply with all applicable parts of ISO 8179 for zinc coatings.

(d) All Fittings shall have a finish layer of shop-applied bituminous paint in accordance with AWWA C-151 latest the revision and shall comply with all applicable parts of ISO 8179 for zinc coatings

7. Markings

   (a) Fittings shall be marked with the weight.

   (b) Fittings shall have distinctly cast upon them the pressure rating, the manufacturer's identification, nominal diameter of the openings, and the number of degree or fraction of the circle on all bends.

8. All tests shall be made in accordance with the methods prescribed by the appropriate ANSI/AWWA standards.

9. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

10. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

11. Fittings shall be bid without accessories (glands, gland gaskets and bolts).

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12. Accessories shall be as specified in Section 3.16 of these Material Specifications.

13. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

    (c) North America shall mean the United States, Canada, and Mexico,

    (d) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

    (e) Formed shall mean metals rolled or pressed or machined to create a finished product,

    (f) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

    (g) Assembled shall mean castings and sourced parts are put together to build a finished product, or

    (h) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

14. Inspection:

    (i) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

    (j) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished products.

15. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

16. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

17. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

3.12.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 8-1/2-inch by 11-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the fittings showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Rated working pressure and hydrostatic test pressure of each finished product(s), and

   (e) Country of origin for each component.

3. The manufacturer at the Commission's request shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish a warranty for the finished Fittings that states that the Fittings shall be free from all defects in material and workmanship and from handling during delivery under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole coupling for a minimum one (1) year time period from time of delivery. Coating failures caused by Installer will not be a cause of coating failure

6. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed Fittings have been made, and the results of all tests conform to the requirements of the appropriate ANSI/AWWA standard.

7. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (f) Name of Municipality/Utility

   (g) Total amount of product bid on and amount delivered

   (h) Date the bid was accepted and date the product was delivered

   (i) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

8. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (j) Approved means the contractor can supply the material as shown on the drawing(s).

   (k) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (l) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.12.3 Ductile Iron Fittings - Compact (or Short) Body

1. Ductile Iron Fittings – Compact (or Short) Body provided to the Commission or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Ductile Iron Fittings – Compact (or Short) Body, as a minimum, meet all specifications as in Paragraphs 3.12.1, 3.12.2, and the following:

3. Ductile Iron Fittings Compact (or Short) Body shall at a minimum conform to ANSI 21.53/AWWA C-153 (most current revision).

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3.12.4 Ductile Iron Fittings – Standard (or Long) Body

1. Ductile Iron Fittings – Standard (or Long) Body provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Ductile Iron Fittings – Standard (or Long) Body, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:

3. Ductile Iron Fittings - Standard (or Long) Body shall at a minimum conform to ANSI 21.10/AWWA C-110 (most current revision).

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3.12.5 Hydrant Anchoring Tees

1. Hydrant Anchoring Tees provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Hydrant Anchoring Tees, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:

3. Hydrant Anchoring Tees shall conform to ANSI A21/AWWA C-110 (most current revision).

4. Hydrant Anchoring Tees shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified and the branch shall have a plain end with an integral gland and rotating mechanical joint gland and mechanical joint restraints to provide a restrained connection.

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3.12.6 Solid Sleeve

1. Solid Sleeves provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Solid Sleeves, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:

3. Solid Sleeves shall conform to ANSI A21/AWWA C-110 (most current revision).

4. Solid Sleeves shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified.

5. Solid sleeves, at a minimum, shall be provided with a ¾" NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before putting the water main back in service.

3.12.7 Split Repair sleeve

1. Split Repair Sleeves provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Split Repair Sleeves, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:

3. Split Repair Sleeves shall conform to ANSI A21/AWWA C-110 (most current revision).

4. Split Repair sleeves for ductile iron shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified.

5. Split Repair sleeves for cast iron shall be mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified. When specified for cast iron pipe restraining glands are not required.

6. Split Repair sleeves, at a minimum, shall be provided with a ¾" NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before putting the water main back in service.

7. Split Repair sleeves shall be provided with split gland and body components.

8. Split Repair sleeve side rubber gaskets shall be rectangular to cross-section and shall fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve. Gaskets shall be made of Nitrile (Buna-N).

9. Split Repair sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.

3.12.8 Fitting Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Ductile Iron Fittings – Compact and Standard Body

   (a) American Cast Iron Pipe Co. – all fittings,

   (b) Atlantic States Pipe (McWayne, Inc.) – all fittings,

   (c) Griffon Pipe Products, Inc. – all fittings,

   (d) Tyler Union – all fittings,

   (e) U. S. Pipe and Foundry Co. – all fittings, or the equal product of another manufacturer.

2. Ductile Iron Fittings – Hydrant Anchoring Tees

   (a) American Cast Iron Pipe Co.,

   (b) Atlantic States Pipe (McWayne, Inc.),

   (c) Griffon Pipe Products, Inc.,

   (d) Tyler Union,

   (e) U. S. Pipe and Foundry Co., or the equal product of another manufacturer.

3. Ductile Iron Fittings – Solid Sleeves

   (a) American Cast Iron Pipe Co.,

   (b) Atlantic States Pipe (McWayne, Inc.),

   (c) Griffon Pipe Products, Inc.,

(d) Tyler Union,

(e) U. S. Pipe and Foundry Co., or the equal product of another manufacturer.

4. Ductile Iron Fittings – Split Repair Sleeves

(a) American Cast Iron Pipe Co. – model 2800,

(b) Atlantic States Pipe (McWayne, Inc.),

(c) Griffon Pipe Products, Inc.,

(d) Mueller Co. – models H-785 and H-786

(e) Tyler Union - ,

(f) U. S. Pipe and Foundry Co., or the equal product of another manufacturer.

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Section 3.13 COUPLINGS

3.13.1 General

1. Couplings provided to the Springfield Water and Sewer Commission or its Contractors shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Couplings as a minimum shall conform to the most current American Water Works Association Standard C-219 and all addenda thereto.

3. Working pressure shall be rated at 200-PSI. Test pressure shall be 1.5 times the rated working pressure (375-PSI).

4. Couplings shall be provided with gaskets constructed of Styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds for water service, molded, not split and glued, and must meet or exceed ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision.

5. The exterior coating all couplings shall be fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 of the latest revision and shall be applied to the interior and exterior of the fitting.

6. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

7. At the Commission's discretion, track-head or tee-head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel may be substituted. A request for the substitution must be submitted in writing to E&TS. Track head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) medium carbon steel flat washer and nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged. All the non-stainless steel bolts, nuts, and washers shall be rust proof coated or plated.

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8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

9. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Formed shall mean metals rolled or pressed or machined to create a finished product,

   (d) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

10. Inspection:

    (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

    (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished products.

11. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity

comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

12. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

13. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

3.13.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 8-1/2-inch by 11-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the hydrant showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Country of origin for each component.

3. The manufacturer at the Commission's request shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish a warranty for the finished couplings that states that the couplings shall be free from all defects in material and workmanship and from handling during delivery under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole coupling for a minimum one (1) year time period

from time of delivery. Coating failures caused by Installer will not be a cause of coating failure

6. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed couplings have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-219.

7. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

8. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (a) Approved means the contractor can supply the material as shown on the drawing(s).

   (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.13.3 Standard Range Couplings 4" – 24"

1. Standard Range Couplings 4" – 24" shall, as a minimum, meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Standard Range Couplings 4" – 24" shall have both center and end rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.

3. Standard Range Couplings 4" – 24" shall have the center rings, end rings, and gaskets clearly labeled to show the diameter range it will cover.

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3.13.4 Wide Range Couplings 4" – 24"

1. Wide Range Couplings 4" – 24" shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Wide Range Couplings 4" – 24" shall have both center and end rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.

3. Wide Range Couplings 4" – 24" shall have the center rings, end rings, and gaskets clearly labeled to show the diameter range it will cover.

3.13.5 Wide Range Two Bolt Couplings up to 12-inch

1. Wide Range Two Bolt Couplings shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Wide Range Two Bolt Couplings shall have center ring, end rings, and bolt guides made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision. Center ring shall include a handle to ease installation.

3. Wide Range Two Bolt Couplings shall be provided with preassembled wide range gaskets and one additional gasket to cover extra wide range. The gasket shall be clearly labeled to show the diameter range it will cover. A heavy gauge 304 stainless steel armor shall be installed on each gasket.

3.13.6 Wide Range Two Bolt Couplings 16-inch to 24-inch

1. Wide Range Two Bolt Couplings shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Wide Range Two Bolt Couplings shall have end rings made of high strength ductile iron ASTM A-536 grade 60-40-18 for 16-inch or medium carbon steel ASTM A-795 for 18-inch to 24-inch, latest revisions.

3. Wide Range Two Bolt Couplings shall have center ring, made of high strength medium carbon steel ASTM A53 grade A, latest revisions.

4. Wide Range Two Bolt Couplings shall be provided with preassembled wide range gaskets. The gasket shall be clearly labeled to show the diameter range it will cover. A heavy gauge 304 stainless steel armor shall be installed on each gasket.

3.13.7 Large Diameter Wide Range Couplings 16-inch to 24-inch

1. Large Diameter Wide Range Couplings 16" and larger shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Large Diameter Wide Range Couplings 16” and larger coupling shall have both center and end rings made of shall have both center and end rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.

3. Large Diameter Wide Range Couplings 16” and larger coupling shall be clearly labeled to show the diameter range it will cover.

3.13.8 Couplings 30” – 48”

1. Couplings 30” – 48” shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Couplings 30” – 48” shall have the center rings that are either beveled or flared and made of formed carbon steel per ASTM A-36 with minimum yield of 30,000 PSI.

3. Couplings 30” – 48” shall have end rings that are contoured rolled mill section carbon steel per AISI 1018-1020. End ring thickness shall be determined by pipe O.D. and pressure rating.

4. Vendor shall provide complete diameter range information on the couplings being bid.

3.13.9 Coupling with End Caps and Threaded Outlets up to 16-inch

1. Couplings with end caps and threaded outlets shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Couplings and end caps shall have the center ring, both end rings, and the end cap made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.

3. End caps to be furnished with a 2" threaded NPT female outlet with plug.

4. Vendor shall provide complete diameter range information on the couplings being bid.

3.13.10 Coupling with End Caps and Threaded Outlets greater than 16-inch

1. Couplings with end caps and threaded outlets shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:

2. Couplings and end caps shall have the center rings that are either beveled or flared and made of formed carbon steel per ASTM A-36 with minimum yield of 30,000 PSI.

3. Couplings with end caps shall have end rings that are contoured rolled mill section carbon steel AISI 1018-1020. End ring thickness shall be determined by pipe O.D. and pressure rating.

4. End caps to be furnished with a 2" threaded NPT female outlet with plug.

5. Vendor shall provide complete diameter range information on the couplings being bid.

3.13.11 Coupling Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Standard Range Couplings 4" – 24" shall be

   (a) Dresser – Style 253 (up to 16-inch only),

   (b) Ford – Style FC1,

   (c) Romac - Style 501 couplings,

   (d) Smith-Blair – OMNI 441A (up to 16-inch only), or

   (e) Equal provided the products are manufactured as per these specifications.

2. Wide Range Couplings 4" – 24" shall be

   (a) Dresser – Style 253,

   (b) Mueller – Maxi-Range,

   (c) Romac - Style XR501 couplings, or

   (d) Equal provided the products are manufactured as per these specifications.

3. Wide Range Two Bolt Couplings up to 12-inch shall be

   (a) Romac – Macro HP, or

   (b) or the equal product of another manufacturer.

4. Wide Range Two Bolt Couplings 16-inch to 24-inch shall be

   (a) Krause – Hymax, or

(b) the equal product of another manufacturer.

5. Couplings 30" – 48" shall be

   (a) Dresser – Style 38 or 138,

   (b) Ford – Style FC4,

   (c) Romac style 400,

   (d) Smith Blair 411A or 413A, or

   (e) the equal product of another manufacturer.

6. Coupling with End Caps and Threaded Outlets up to 16-inch

   (a) Romac Style EC501, or

   (b) the equal product of another manufacturer.

7. Coupling with End Caps and Threaded Outlets greater than16-inch

   (a) Dresser – Style 38 or 138

   (b) Ford Style FC4,

   (c) Romac Style FC400

   (d) Smith Blair Style 481A, or

   (e) the equal product of another manufacturer.

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Section 3.14 CLAMPS

3.14.1 General

1. All Clamps in this section provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

3. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at

protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

3.14.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the clamp(s) showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

7. The manufacturer and/or vendor shall furnish a certified statement that all butterfly valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

8. The manufacturer and/or vendor shall furnish a warranty for the clamp(s) that states that the clamp(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole butterfly valve for a minimum ten (10) year time period from time of delivery.

9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seal test to demonstrate the clamp(s) will hold pressure as required.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.14.3 Repair Clamps and Clamps with Outlets

1. Repair Clamps and Clamps with Outlets provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Repair Clamps and Clamps with Outlets shall, as a minimum, meet all specifications as in Paragraphs 3.14.1, 3.14.2, and the following:

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3. Repair clamps shall be single section up to 12-inch diameter and three sections for 16-inch through 24-inch diameter.

4. Shells shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel lugs and side bars welded to the shell.

5. Lugs and side bars shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel fasteners welded to the lugs and side bars.

6. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

7. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

8. All welds used in the construction of the repair clamps shall conform to all American Welding Society (AWS) codes. All welds shall be fully passivated in order to restore the stainless steel to its original corrosive resistant characteristics.

9. Repair clamps shall be provided with gaskets constructed of Styrene butadiene rubber (SBR) compound for water service and must meet or exceed ASTM-D-2000-AA-415.

10. Ranges must be clearly labeled on the package as well as on each clamp.

11. Clamps with outlets shall have Mueller CC thread.

12. Range diameter information must be provided from vendor on the clamps bid.

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3.14.4 Repair Clamp Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Single section clamps shall be:

   (a) Cascade - Style CR1,

   (b) Dresser – Style 364 (up to 12-inch diameter)

   (c) Ford – Style FS1,

   (d) Romac - SS1, or

   (e) Equal provided the products are manufactured as per these specifications.

2. Three section clamps shall be,

   (a) Cascade - Style CR3,

   (b) Ford – Style FS3

   (c) Romac – SS3, or

   (d) Equal provided the products are manufactured as per these specifications.

3.14.5 Bell Joint Clamps

3. Bell Joint Clamps provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

4. Bell Joint Clamps shall, as a minimum, meet all specifications as in Paragraphs 3.14.1, 3.14.2, and the following:

5. Bell Joint Clamps shall have the bell and spigot rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision or formed carbon steel per ASTM A-36 with minimum yield of 30,000 PSI.

6. Bell Joint Clamps shall have a minimum pressure rating of 150-PSI.

7. The coating for bell joint clamps shall be fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 of the latest revision and shall be

applied to the interior and exterior of the fitting, unless otherwise approved by the Commission.

8. Bell joint clamps shall fit rubber ring joint (Tyton), caulked joint (poured), or both for all classes of cast iron and ductile iron pipe.

9. Bell joint clamps shall be provided with gaskets constructed of Styrene butadiene rubber (SBR) compound for water service and must meet or exceed ASTM-D-2000-MBA 710.

10. The coating all bell joint clamps shall be fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 of the latest revision and shall be applied to the interior and exterior of the clamp.

11. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

12. At the Commission's discretion, track-head or tee-head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel may be substituted. A request for the substitution must be submitted in writing to E&TS. Track head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) medium carbon steel flat washer and nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged. All the non-stainless steel bolts, nuts, and washers shall be rust proof coated or plated.

13. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

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3.14.6 Bell Joint Clamp Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Bell joint clamps to fit rubber ring joint (Tyton) and caulked joint (poured) shall be:

   (a) Dresser – Style 60 (up to 60-inch),

   (b) Dresser – Style 160 (6-inch, 8-inch, 12-inch, & 16-inch)

   (c) Romac - Style 516 (4-inch – 14-inch),

   (d) Romac - Style 416 (12-inch – 24-inch, for pipe sizes greater than 24-inch specify Style 418 with pipe outside diameter (OD), bell OD, bell length, and maximum pressure),

   (e) Ford - Style FBCF (14-inch – 36-inch, call for pipe sizes greater than 36-inch with pipe outside diameter (OD), bell OD, bell length, and maximum pressure), or

   (f) Equal provided the products are manufactured as per these specifications.

2. Bell joint clamps to fit caulked joint (poured) with stab joint bells (long tapered bell with no shoulder for anchoring a bell ring) shall be:

   (a) Dresser – Style 60S,

   (b) Romac - Style 418 (12” – 24”), or

   (c) Equal provided the products are manufactured as per these specifications.

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3.14.7 Socket Clamps

1. 4-bolt Socket Clamps provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. 4-bolt Socket clamps shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).

3. 4-bolt Socket clamps shall be constructed of carbon steel per ASTM A36 with minimum yield strength of 36000-PSI or material of equal or greater minimum yield strength.

4. 4-bolt Socket Clamps shall be two (2) half bands with four (4) bolts (two (2) on each side).

5. Socket Clamps shall have the minimum following dimensions:

   (a) 4-inch to 6-inch pipe: ½-inch by 2-inch

   (b) 8-inch to 10-inch pipe: 5/8-inch by 2-1/2-inch

   (c) 12-inch pipe: 5/8-inch by 3-inch

   (d) 16-inch pipe: ¾-inch by 4-inch

6. Socket Clamp bolt hole diameters shall be a 1/16-inch larger than the bolt diameter.

7. Socket Clamp bolts shall have the minimum following dimensions:

   (a) 4-inch to 6-inch pipe: 5/8-inch-11 by 3-1/2-inch

   (b) 8-inch pipe: 5/8-inch-11 by 4-inch

   (c) 10-inch pipe: 3/4-inch-10 by 4-inch

   (d) 12-inch pipe: 7/8-inch-9 by 4-inch

   (e) 16-inch: 1-inch by 4-1/2-inch

8. Socket Clamps shall be provided plain without a coating.

9. All fasteners provided with the Socket Clamps shall be made of 4140 chrome moly steel per ASTM A193 grade B7, medium carbon steel per ASTM A194 grade 2H,

or high strength low alloy steel per ASTM A588 grade B with Unified National Coarse (UNC) rolled thread, as specified in the following paragraphs and sections.

10. Delivery shall be specified in terms of number of days from receipt of order.

11. The manufacturer/vendor/shipper must use care in preparing the above product for shipment and in handling, to insure that the products are delivered without damage. Particular attention must be directed at protecting the products from damage. Damaged products will not be accepted.

12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

13. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

3.14.8 Socket Clamp Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Socket Clamps shall be:

   (a) PHD Manufacturing, Inc. - Figure 590,

   (b) Anvil Company - Figure 595,

   (c) Cooper B-Line - Figure B3134,

   (d) Carpenter and Patterson - Figure 158DB, or

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(e) Equal provided the products are manufactured as per these specifications.

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3.14.9 Fabricated Steel Harness Assembly

1. Fabricated Steel Harness Assembly provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Fabricated Steel Harness Assembly shall be constructed of carbon steel per ASTM A36 with minimum yield strength of 36000-PSI.

3. Fabricated Steel Harness Assembly shall be provided plain without coating.

4. Fabricated Steel Harness Assembly shall be as manufactured by Ford – Style FR1, Dresser – Style 443, or equal product of another manufacturer.

5. Delivery shall be specified in terms of number of days from receipt of order.

6. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Particular attention must be directed at protecting the product from damage. Damaged products will not be accepted.

7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

8. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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3.14.10Socket Clamp Washer

1. Socket clamp washers provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Socket clamp washers shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).

3. Socket Clamp Washer shall be cast iron, ductile iron, or low carbon steel and square or round.

4. Cast iron and ductile iron Socket Clamp Washers shall have the minimum following dimensions:

   (a) 4-inch, 6-inch, 8-inch, and 10-inch pipe:

   - Square: 5/8-inch by 3-inch by 3-inch
   - Round: 5/8-inch by 3-inch diameter

   (b) 12-inch pipe:

   - Square: 3/4-inch by 3-1/2-inch by 3-1/2-inch
   - Round: 3/4-inch by 3-1/2-inch diameter

   (c) 16-inch pipe:

   - Square: 1-inch by 4-inch by 4-inch
   - Round: 1-inch by 4-inch diameter

5. Steel Socket Clamp Washers shall have the minimum following dimensions:

   (a) 4-inch, 6-inch, 8-inch, and 10-inch pipe:

   - Square: 1/2-inch by 3-inch by 3-inch with 7/8-inch hole size
   - Round: 1/2-inch by 3-inch diameter with 7/8-inch hole size

   (b) 12-inch and 16-inch pipe:

   - Square: 1/2-inch by 3-1/2-inch by 3-1/2-inch with 1-1/16-inch hole size
   - Round: 1/2-inch by 3-1/2-inch diameter with 1-1/16-inch hole size

6. Socket Clamp Washers shall be provided plain, with out a coating.

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7. Socket Clamps Washers shall be as provided by PHD Manufacturing, Inc. Figure 595, Anvil Company, Figure 594, Cooper B-Line, Figure B3134W, Carpenter and Patterson, Figure 258, or the equal product of another manufacturer.

8. Delivery shall be specified in terms of number of days from receipt of order.

9. The manufacturer/vendor/shipper must use care in preparing socket clamp washers for shipment and in handling during shipment and delivery, to insure that the socket clamp washers are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged bell joint clamps will not be accepted.

10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the socket clamp washers and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

11. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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3.14.11 Bent Eye Bolts

1. Bent Eye Bolts provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Bent Eye Bolts shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).

3. Bent Eye Bolts diameters shall be:

   (a) For ¾-inch threaded rod: ¾-inch diameter shank with a ¾-inch nominal inside diameter bolt hole.

   (b) For 1-inch threaded rod: ¾-inch diameter shank with a 1-inch nominal inside diameter bolt hole.

4. Bent Eye Bolts shall be provided in the following minimum lengths:

   (a) 4-inch thru 10-inch clamps shall be 4-inch minimum

   (b) 12-inch and larger clamps shall be 5-inch minimum

5. Bent Eye Bolts shall be constructed of high strength low alloy steel, per ASTM A588, grade B, Unified National Coarse (UNC) rolled thread.

6. Bent Eye Bolts shall be provided with heavy hex nuts made of medium carbon steel, ASTM A194, grade 2H, and Unified National Coarse (UNC) thread.

7. Bent Eye Bolts shall have a minimum tensile strength of 50,000 PSI.

8. Bent Eye Bolts shall be as provided by PHD Manufacturing, Inc. - Figure 598B, Star National Products - Figures ¾"SST747 or ¾"SST757, Dresser Piping Specialties, Inc. – Style 442, or the equal product of another manufacturer.

9. Delivery shall be specified in terms of number of days from receipt of order.

10. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Particular attention must be directed at protecting the products from damage. Damaged products will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the products and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

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12. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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3.14.12Threaded Rods

1. Threaded rods provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Threaded rods shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).

3. Threaded Rod diameters shall be:

   (a) For 4-inch through 10-inch pipe: ¾-inch diameter.

   (b) For 12-inch through 16-inch pipe: 1-inch diameter.

4. Threaded Rods shall be provided in either 3-foot, 6-foot, or 12-foot lengths.

5. Threaded Rods shall be constructed of 4140-alloy steel, per ASTM A193, grade B7, Unified National Coarse (UNC) rolled thread.

6. Threaded Rods shall have a minimum tensile strength of 62,500 PSI.

7. Threaded Rods shall be provided with heavy hex nuts made of medium carbon steel, ASTM A194, grade 2H, and Unified National Coarse (UNC) thread.

8. Threaded Rods shall be provided with case hardened steel washers made of C1006 steel, grade 2, Rockwell hardness B55, with the following dimensions:

	Nominal Inside Diameter (In Inches)	Nominal Outside Diameter (In Inches)	Thickness (In Inches)
¾” Threaded Rod	13/16	2	.122 - .177
1” Threaded Rod	1	2-1/2	.136 - .192

- Washers may be provided with cadmium plating, another plating, or unplated.

9. Delivery shall be specified in terms of number of days from receipt of order.

10. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Particular attention must be at protecting the products from damage. Damaged products will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the threaded rods and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

12. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 3.15 TAPPING SLEEVES

3.15.1 General

1. All Tapping Sleeves provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. All Tapping Sleeves in this section shall have all parts cast and assembled in North America or meet the requirements of the American Iron and Steel (AIS) as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

3. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).

4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at

protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

6. All tapping sleeves shall be NSF 61 certified.

7. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

3.15.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the gate valve showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying

component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

7. The manufacturer and/or vendor shall furnish a certified statement that all butterfly valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

8. The manufacturer and/or vendor shall furnish a warranty for the butterfly valves that states that the butterfly valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole butterfly valve for a minimum ten (10) year time period from time of delivery.

9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.15.3 Stainless Steel Tapping Sleeves

1. Tapping Sleeves shall, as a minimum, meet all specifications as in Paragraphs 3.15.1, 3.15.2, and the following:

2. Tapping sleeves shall be constructed of Grade 18-8, Type 304 stainless steel with removable stainless steel fasteners.

3. Tapping sleeves shall be provided with a ¾" NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before tapping.

4. Bolt Lugs shall be 3/16" minimum thickness.

5. Tapping sleeves shall be provided with gaskets made of gridded styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounded for water service and shall meet ASTM D2000-80M 4AA607.

    (a) The sleeve gasket shall provide 360 degree full circumferential support over the full length of the sleeve.

    (b) The sleeve gasket shall have heavy gauge stainless steel armors, a minimum of 2-1/4" wide, bonded in place to span the gap between the tapping sleeve sections.

    (c) The outlet gasket shall be made of Nitrile (Buna-N).

6. The flange shall be made of Grade 18-8, Type 304 Stainless Steel. The flange shall conform to AWWA C207 Class D ANSI 150 lb. The flange shall be recessed to accept standard AWWA tapping valves. The bolt holes shall straddle the pipe center line. Iron flanges shall not be accepted.

7. Tapping sleeves shall be rated 150 PSI working pressure and 225 PSI minimum test pressure.

8. All welds used in the construction of the tapping sleeve shall conform to all American Welding Society (AWS) codes. All welds shall be fully passivated in order to restore the stainless steel to its original corrosive resistant characteristics.

9. Tapping sleeves shall be provided with a Grade 18-8, Type 304 Stainless Steel outlet. The outlet shall be double welded, at two places, the flange and the sleeve to provide maximum strength.

3.15.4 Ductile Iron Tapping sleeves

1. Tapping Sleeves shall, as a minimum, meet all specifications as in Paragraphs 3.15.1, 3.15.2, and the following:

2. Tapping sleeves shall be constructed of high strength ductile iron conforming to ASTM A-536 grade 65-45-12. The bolt holes shall straddle the pipe center line.

3. Tapping sleeves shall be mechanical joint conforming to ANSI A21.11/AWWA C-111, unless otherwise specified.

4. Tapping sleeves shall be provided with a ¾" NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before tapping.

5. Tapping sleeves shall be provided with gland and body components made of grade 60-42-10 ductile iron conforming to ASTM A536-84.

6. Tapping sleeve outlet gasket shall be made of Nitrile (Buna-N).

7. The tapping sleeve outlet flange dimensions shall comply with ANSI B16.1 class 125 and with MSS SP-60. The flange shall be recessed to accept standard AWWA tapping valves.

8. Tapping sleeves shall be rated 150 PSI working pressure and 225 PSI minimum test pressure.

9. Exterior Coating shall be Fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 and shall be applied to the interior and exterior of the fitting.

10. Markings

    (a) Fittings shall be marked with the weight.

(b) Fittings shall have distinctly cast upon them the pressure rating, the manufacturer's identification, nominal diameter of the openings, and the number of degree or fraction of the circle on all bends.

11. Testing

All tests shall be made in accordance with the methods prescribed by the above mentioned AWWA standards judgment.

3.15.5 Stainless Steel Tapping Sleeves Makes and Models Approved for use by the Commission

The following stainless steel tapping sleeves have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Dresser Industries, Inc. - style 630,
2. Ford Meter Box Company - style FTSS,
3. Romac Industries, Inc. - style SSTIII,
4. Smith Blair – 622,
5. or the approved equal product of another manufacturer.

3.15.6 Ductile Iron Tapping Sleeves Makes and Models Approved for use by the Commission

The following ductile iron tapping sleeves have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Clow – Model F-5205,
2. Mueller – Models H-615 & H-616,
3. U.S. Pipe – Models H-615 & H-616,
4. or the approved equal product of another manufacturer.

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Section 3.16 JOINT ACCESSARIES

3.16.1 General

1. All Joint Accessories or Kits provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

3. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the product(s).

4. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.

5. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s)

and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

3.16.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the product(s) showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each finished product(s), and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all the product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the product(s t that states that the product(s shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the product(s for a minimum one (1) year time period from time of delivery.

8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (a) Approved means the contractor can supply the material as shown on the drawing(s).

   (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

3.16.3 Delivery

1. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

3.16.4 Mechanical Joint Restraint for Ductile Iron Fittings and Valves

1. Mechanical Joint Restraint for Ductile Iron Fittings shall, as a minimum, meet all specifications as in Paragraphs 3.15.1, 3.15.2, and the following:

2. Mechanical Joint Restraint for Ductile Iron Fittings provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

3. Mechanical Joint Restraint for Ductile Iron Fittings and Valves shall conform to the American Water Works Association Standard C-111 (latest edition) for: "Rubber Gasket Joints for Ductile Iron Pipes and Fittings".

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4. All Mechanical Joint Restraint for Ductile Iron Fittings and Valves shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

5. Mechanical Joint Restraint for Ductile Iron Fittings shall be provided with gland and body components made of grade 60-42-10 ductile iron conforming to ASTM A536-84. The casting shall be flat, with no protrusions, where the torque limiting twist-off nuts actuates the restraining wedges.

6. Mechanical Joint Restraint for Ductile Iron Fittings shall be incorporated into the design of the follower gland. The restraining mechanism shall consist of individually actuated wedges that increase their resistance to pull out as pressure or external forces increase.

7. Mechanical Joint Restraint for Ductile Iron Fittings shall be capable of full mechanical joint deflection during assembly and the flexibility of the joint shall be maintained after burial.

8. The joint restraint ring and its wedging components shall be made of grade 60-42-10 ductile iron conforming to ASTM A536-84.

   (a) The wedge shall be ductile iron, heat-treated to a minimum hardness of 370 B H N.

   (b) The joint restraint ring shall be provided with torque limiting twist-off nuts of high strength, low alloy, corrosion resistant, Cor-Ten steel. The twist-off nuts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Twist-off nuts shall be Unified National Coarse (UNC) rolled thread.

9. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C-111/AZ1.11 and ANSI/AWWA C-153/A21.53 of the latest revision. Torque limiting twist-off nuts shall be used to insure proper actuation of the restraining wedge.

10. Mechanical Joint Restraint for Ductile Iron Fittings shall be available in the four through forty-eight inch sizes.

11. Mechanical Joint Restraint for Ductile Iron Fittings shall have a rated working pressure as follows:

    (a) 4-inch – 8-inch = 350 PSI

(b) 10-inch – 16-inch = 300 PSI

(c) 20-inch – 36-inch = 200PSI

(d) 42-inch – 48-inch = 175 PSI

12. Mechanical Joint Restraint for Ductile Iron Fittings shall be listed by Underwriters Laboratories up through the twenty-four-inch size and approved by Factory Mutual up through the twelve-inch size.

13. Mechanical Joint Restraint for Ductile Iron Fittings shall be provided with tee-head bolts, washers, and nuts of high strength, low alloy, and corrosion resistant Cor-Ten steel. Tee head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged.

14. Mechanical Joint Restraint for Ductile Iron Fittings shall be individually packaged and contain proper size rubber gasket and bolts.

3.16.5 Flange Gasket and Hardware for Ductile Iron Pipe, Fittings, & Valves

1. Flange Gaskets and Hardware provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Flange gaskets for 12-in diameter flanges or less shall be Type E or “full-face” with bolt holes cut to match ANSI B16.1 drilling.

3. Flange gaskets 14-inch through 64-inch diameter shall be Type F or “ring gaskets” with inside and outside dimensions as specified in AWWA C115, Table A.1.

4. Flange gaskets shall be cut from sheet stock by a qualified gasket distributor to the dimensions included in AWWA C115, Table A.1. No field-cut or field-modified gaskets shall be allowed.

5. Flange gaskets for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:

   (a) Flange gaskets shall be manufactured from premium quality red rubber made from natural rubber and styrene butadiene rubber (SBR) with a smooth finish.

   (b) Thickness: 1/8-inch

(c) Hardness (Durometer) (Shore A) +/-5: 75

(d) Minimum Tensile Strength (ASTM D142): 700-psi

(e) Compression Set at 158ºF (ASTM Method B): 22-hrs. 40% maximum

(f) Pressure Rating max.: 250-psi

(g) P x T min. (psi x T˚F): 20,000

6. Flange gaskets for severe pressure (greater than 150-psi or as required by the Commission) applications shall have documented physical properties, as follows:

   (a) Flange gaskets shall be manufactured from premium quality compressed sheet stock of non-asbestos aramid fibers with a Nitrile binder.

   (b) Thickness: 1/8-inch

   (c) Minimum Tensile Strength across grain (ASTM F152): 2000-psi

   (d) Compressibility Range (ASTM F36): 8-16%

   (e) Recovery (ASTM F36): 50%

   (f) Creep Relaxation Range (ASTM F38): 20%

   (g) Gasket Maintenance Factor Range – *m* (ASTM F586): 4.2

   (h) Minimum Seating Stress Range – *y* (ASTM F586): 2931-psi

   (i) Seal Initiation Stress Range, G_b (ROTT): 400-psi

   (j) Gasket Stress/Tightness Ratio Range, *a* (ROTT): 0.35

   (k) Unloading Gasket Stress Range, G_s (ROTT): 20-psi

   (l) P x T min. (psi x T˚F): 52,500

7. All flange bolts and nuts shall be provided with flat washers so that the epoxy coating is not damaged during installations.

8. Flange bolts for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:

   (a) All flange bolts length shall be selected so that three full threads, as a minimum, protrude from the hex nut and washer after assembly,

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(b) Bolts shall be Unified National Coarse (UNC) Class 2B rolled thread.

(c) Flange bolts shall be made of Type 304 stainless steel.

(d) Flange bolts shall be in accordance with ASTM A193 Grade B8, Class 2 all sizes, latest revision or ASTM F593C Condition CW1 sizes up to 5/8-inch or F593D Condition CW2 for sizes ¾-inch and greater, latest revision,

(e) Minimum Tensile Strength (ASTM A193): 105 through 125-ksi

(f) Minimum Tensile Strength (ASTM F593): 85 through 150-ksi

(g) Minimum Yield Strength (ASTM A193): 65 through 100-ksi

(h) Minimum Yield Strength (ASTM F593): 45 through 65-ksi

(i)

9. Flange nuts for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:

   (a) Flange nuts shall be Unified National Coarse (UNC) Series Class 2B heavy-duty hex nuts.

   (b) Flange nuts shall be made of Type 304 stainless steel.

   (c) Flange nuts shall be in accordance with ASTM A194 Grade 8, Class 2 all sizes, latest revision or ASTM F594C Condition CW1 sizes up to 5/8-inch or F594D Condition CW2 for sizes ¾-inch and greater, latest revision,

   (d) Minimum Proof Stress (ASTM A194): 80-ksi

   (e) Minimum Proof Stress (ASTM F594): 92 through 108-ksi

   (f) Brinnell Hardness (ASTM A194): min. 126, max. 300

   (g) Rockwell Hardness (ASTM F594): min. B80, max. C32

   (h) At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling

10. Flat washers to be used with flange bolts and nuts for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:

    (a) Flat washers shall be made of Type 304 stainless steel, type A SAE or ASME

11. Flange bolts, nuts, and flat washers shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers Type A SAE or ASME so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

12. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

13. To assist in assembly of flanged joints, an adhesive-backed flange gaskets may be used. Adhesive backing material shall be: 467MP High Performance Adhesive Transfer Tape, manufactured by 3M Industrial Adhesives and Tapes Division, St. Paul, Minnesota, or an approved equal.

3.16.6 Gasket Joint Restraint for Ductile Iron Pipe

1. Gasket Joint Restraint for Ductile Iron Pipe provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. The Gasket Joint Restraint for Ductile Iron Pipe shall conform to AWWA C-111 (most current revision) for Rubber-Gaskets Joints for Ductile Iron Pressure Pipe and Fittings.

3. Gasket Joint Restraint shall be for rubber ring joint (Tyton).

4. The restraint provided shall be a boltless, integral retaining system, and shall be rated for 350 PSI.

3.16.7 Mechanical Joint Restraint Approved for use by the Commission

The following Mechanical Joint Restraints have been approved for use by the Commission. Any change in any component(s) of the Mechanical Joint Restraint that

does not allow for interchangeability of the component(s) shall result in the Mechanical Joint Restraint no longer being approved and removed from this list.

1. EBAA Iron Sales, Inc. – Series 1100,
2. Ford Meter Box Company, Inc. – Series 1400,
3. Romac – Roma Grip,
4. Tyler/Union – TUF Grip, or
5. Equal provided the Mechanical Joint Restraint are manufactured as per these specifications.

3.16.8 Flange Gasket for Distribution System (operating pressure 150-psi or less) Applications Approved for use by the Commission

The following Flange Gaskets suppliers have been approved for use by the Commission. Any change in any component(s) of the flange gasket that does not allow for interchangeability of the component(s) shall result in the flange gasket no longer being approved and removed from this list.

1. 22-Red SBR rubber, manufactured by Garlock Sealing Technologies, Palmyra, New York,
2. Flange-Tyte SBR rubber, Manufactured by U.S. Pipe and Foundry Co., Birmingham, AL,
3. Toruseal by American Cast Iron Pipe Company, Birmingham, AL, or
4. Equal provided the Flange Gaskets are manufactured as per these specifications.

3.16.9 Flange Gasket for Severe Pressure (operating pressure greater than 150-psi) Applications Approved for use by the Commission

The following Flange Gaskets suppliers have been approved for use by the Commission. Any change in any component(s) of the flange gasket that does not allow for interchangeability of the component(s) shall result in the flange gasket no longer being approved and removed from this list.

1. Durlon 8500, manufactured by Gasket Resources, Inc., Exton, Pennsylvania,
2. Blue-Gard 3000, manufactured by Garlock Sealing Technologies, Palmyra, New York,
3. Klingersil 4430, manufactured by Thermoseal, Inc., Sidney, Ohio,

4. SF3300 manufactured by Flexitallic, Ltd, Deer Park, Texas, or

5. Equal provided the Flange Gaskets are manufactured as per these specifications.

3.16.10 Gasket Joint Restraint Approved for use by the Commission

The following Mechanical Joint Restraints have been approved for use by the Commission. Any change in any component(s) of the Mechanical Joint Restraint that does not allow for interchangeability of the component(s) shall result in the Mechanical Joint Restraint no longer being approved and removed from this list. Gasket Joint Restraint for rubber ring joint (Tyton) shall be as manufactured by

1. United States Pipe and Foundry Company – Field Lok 350 Gasket (4" – 24"),

2. Specification Rubber Products, Inc. – Barracuda Gaskets (4" – 24"), or

3. Equal provided the Gasket Joint Restraint is manufactured as per these specifications.

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Section 3.17 ADAPTERS

3.17.1 Bolt-thru Mechanical Joint Restraint (Foster Adapter)

1. The bolt-thru mechanical joint restraint shall be made of ductile iron conforming to ASTM A536, 80-55-06.

2. The bolt-thru mechanical joint restraint shall connect valves and/or fittings at a linear distance not to exceed one and one-half (1-1/2) inches and without attachment to pipe.

3. The bolt-thru mechanical joint restraint shall be provided with an NSF 61 asphaltic seal coat in accordance with ANSI A21/AWWA C-110, Section 4.3 of latest the revision.

4. The bolt-thru mechanical joint restraint shall be provided with mechanical joint gaskets made of styrene butadiene rubber (SBR) compounded for water service and shall conform to the latest revision of AWWA C111/ ASTM f-477.

5. The bolt-thru mechanical joint restraint shall be provided with tee-head bolts, washers, and nuts of high strength, low alloy, and corrosion resistant Cor-Ten steel. Tee head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged.

6. The bolt-thru mechanical joint restraint may be ordered with longer bolt packs to restrain full bodied fittings and certain butterfly valves, etc. with thicker flanges.

7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

8. Delivery shall be specified in terms of number of days from receipt of order.

9. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the couplings are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged couplings will not be accepted.

10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

11. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 3.18 ANTI-SEIZE LUBRICANTS

3.18.1 Anti-Seize Lubricants

1. Anti-seize lubricants provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Anti-seize lubricants shall be a nickel anti-seize compound capable of achieving the required bolt torque and sealing stress, and future disassembly with minimal manual input.

3. Anti-seize compound shall be as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer.

4. Delivery shall be specified in terms of number of days from receipt of order.

5. The manufacturer/vendor/shipper must use care in preparing above products for shipment and in handling during shipment and delivery, to insure that the above product are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged products will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

7. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

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(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 3.19 PROTECTIVE COATINGS

3.19.1 General

1. Protective primer, protective coating tape, and/or protective outer wrap shall be provided in accordance with ANSI/AWWA C-217 the latest the revision and these Material Specifications.

2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

3. Delivery shall be specified in terms of number of days from receipt of order.

4. The manufacturer/vendor and/or shipper must use care in preparing the product(s) for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged product(s) will not be accepted and returned to manufacturer/vendor at the manufacturer/vendor's cost.

5. The manufacturer/vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

6. References

   The manufacturer/vendor shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

3.19.2 Protective Primer

1. Protective Primer shall be a petrolatum based primer that exhibits preferential wetting capabilities to readily coat wet or dry surfaces and cavities prior to the application of protective wrap.

2. Protective Primer shall be provided in accordance with of ANSI/AWWA C-217 the latest the revision.

3. The Specific Gravity of the Protective Primer shall be 0.8 - 0.9.

4. Protective Primer is required be delivered in the following containers. At time of order the specific containers will be identified;

   (a) cartons of 2 or 4 one gallon cans

   (b) 12 one quart cans, or

   (c) 5 gallon pails.

5. Protective Primer for below grade installations shall be Trenton Wax-Tape primer (Brown), Tapecoat Enviroprime, Denso Paste, or the equal product of another manufacturer.

6. Protective Primer for above ground, in chambers, or other facilities shall be Trenton Temcoat 3000 primer (Brown) or the equal product of another manufacturer.

3.19.3 Protective Coating Tape

1. Protective Coating Tape shall be a prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces.

2. Protective Coating Tape shall be provided in accordance with of ANSI/AWWA C-217 the latest the revision.

3. Protective Coating Tape shall be impervious to continuous moisture levels.

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Material Specifications

4. Protective Coating Tape shall be for use with: bare metal, wood and concrete.

5. Protective Coating Tape shall be compatible with asphalt, coal tar, polyethylene, polypropylene, FBE and urethanes

6. Protective Coating Tape shall have a minimum thickness of 45-mils.

7. Protective Coating Tape shall be resistant to bacteria.

8. Protective Coating Tape shall be provided with a minimum shelf life of one (1) year.

9. Protective Coating Tape shall be delivered in the following size rolls. At time of order the specific size rolls will be identified;

   (a) Protective Tape for Underground 2″ x 9′ rolls

   (b) Protective Tape for Underground 4″ x 9′ rolls

   (c) Protective Tape for Underground 6″ x 9′ rolls

   (d) Protective Tape for Underground 6″ x 18′ rolls

   (e) Protective Tape for Underground 9″ x 18′ rolls

   (f) Protective Tape for Underground 12″ x 18′ rolls

   (g) Protective Tape for Above ground 2″ x 9′ rolls

   (h) Protective Tape for Above ground 4″ x 9′ rolls

   (i) Protective Tape for Above ground 6″ x 9′ rolls

   (j) Protective Tape for Above ground 6″ x 18′ rolls

   (k) Protective Tape for Above ground 9″ x 18′ rolls

   (l) Protective Tape for Above ground 12″ x 18′ rolls.

10. Protective Coating Tape for above ground and in chambers or other facilities shall harden as opposed to remaining pliable for below grade.

11. Protective Coating Tape for below grade installations shall be Trenton - # 1 Wax-Tape, TC - Envirotape, Denso – Denso Tape, or the equal product of another manufacturer.

12. Protective Coating Tape for above ground and in chambers or other facilities shall be Trenton - # 2 Wax-Tape or the equal product of another manufacturer.

3.19.4 Protective Coating Outer Wrap

1. Protective Coating Outer Wrap shall be a clear flexible plastic film designed to provide extra mechanical protection for surfaces coated with protective coating tape.

2. Protective Coating Outer Wrap shall be provided in accordance with of ANSI/AWWA C-217 the latest the revision.

3. Protective Coating Outer Wrap shall have a minimum thickness of 1-mil.

4. Protective Coating Outer Wrap shall be delivered in the following size rolls. At time of order the specific size rolls will be identified;

   (a) Protective Tape Outer wrap for Underground 4″ x 50′ rolls

   (b) Protective Tape Outer wrap for Underground 6″ x 50′ rolls

   (c) Protective Tape Outer wrap for Underground 9″ x 50′ rolls

   (d) Protective Tape Outer wrap for Underground 12″ x 50′ rolls

5. Protective Coating Outer Wrap for below grade installations shall be Trenton Poly Ply, TC Envirostretchwrap, Denso – Densopol/Densoclad Tapes, or the equal product of another manufacturer.

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Material Specifications

Section 3.20 FILL MATERIAL

3.20.1 Bank-run Gravel Aggregate

1. Bank run gravel shall be a granular material, well graded from fine to coarse with a maximum size of 3-inch and shall meet or exceed the Massachusetts Highway Department (MHD) specifications for Gravel Aggregate.

2. Bank-run gravel shall be obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.

3. Bank-run gravel shall not contain vegetation, masses or roots, or individual roots more than 18” long or more than 1/2” in diameter.

4. Bank-run gravel shall be substantially free from loam and other organic matter, clay, frost, frozen lumps, clay, and other fine or harmful substances.

5. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
3/8 inch	70 maximum
No. 10	50 maximum
No. 200	5 maximum

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Material Specifications

3.20.2 Screened Gravel Aggregate

1. Screened gravel shall be a granular material, well graded with hard, durable, particles of proper size and gradation.

2. Screened gravel shall not contain vegetation, masses or roots, or individual roots.

3. Screened gravel shall be free from sand, loam and other organic matter, clay, excess fines and deleterious materials, frost, and frozen lumps.

4. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
1/2 inch	95 minimum
3/8 inch	40 - 70
No. 4	5 maximum

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Material Specifications

3.20.3 Structural Gravel Aggregate

1. Structural gravel shall be gravel, sandy gravel, or gravely sand of proper size and gradation.

2. Structural gravel shall not contain vegetation, masses or roots, or individual roots.

3. Structural gravel shall be free from organic material, loam, wood, clay, trash, snow, ice, frost, frozen lumps, and other objectionable material.

4. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
6-inch	100
No. 4	20 - 95
No. 40	0 - 60
No. 4	8 maximum

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Material Specifications

3.20.4 Common Borrow/Fill

1. Common borrow/fill shall be inert, inorganic natural soils and/or rock, not having more than 5% by weight passing the No. 200 sieve.

2. Common borrow/fill shall have maximum stone size not greater than 6-inch and material shall be well graded throughout entire size range.

3. Common borrow/fill shall be free from clay, organic material, roots, leaves, trash, snow, ice, frozen soil, and other objectionable material that may be compressible or which cannot be compacted properly.

4. Common borrow/fill shall not contain broken concrete, masonry, rubble, asphalt pavement, ceramic tiles, or other similar materials.

5. Common borrow/fill shall be free of ice or frost and no aggregations of soil particles frozen.

6. Common borrow/fill shall have a moisture content within plus or minus 4% optimum moisture content at the borrow/fill source.

7. Common borrow/fill shall have physical properties, as approved by the Commission, such that it can be readily spread and compacted.

8. Common borrow/fill shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
½ inch	50 - 85
No. 4	40 - 55
No. 50	8 - 28
No. 200	0 - 10

3.20.5 Select Common Borrow/Fill

Select common borrow/fill shall be as specified for Common Borrow/Fill except the material shall contain no stones larger than 2-inch in its largest dimension.

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Material Specifications

3.20.6 Crushed Stone ¾-Inch

1. Crushed stone shall consist of sound, durable crushed rock or durable crushed gravel stone, angular in shape and free from structural defects, comparatively free of chemical decay, and free of any foreign material including, but not limited to ice, snow, sand, clay, loam, or other deleterious or organic material.

2. Crushed stone shall be maximum size passing a ¾-inch sieve and retained on a 3/8-inch sieve.

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Material Specifications

3.20.7 Crushed Stone 2-Inch

1. Crushed stone shall consist of sound, durable crushed rock or durable crushed gravel stone, angular in shape and free from structural defects, comparatively free of chemical decay, and free of any foreign material including, but not limited to ice, snow, sand, clay, loam, or other deleterious or organic material.

2. Crushed stone shall be maximum size passing a 2-inch sieve and retained on a 1-inch sieve.

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Material Specifications

3.20.8 Dense Grade Crushed Stone

1. Dense Grade Crushed Stone shall be crusher run coarse aggregates of crushed stone combined with fine aggregates uniformly premix with a predetermined quantity of water.

2. The crusher run coarse aggregates shall consist of hard, durable particles of stone. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.

3. The crusher run coarse aggregates shall have a percentage of wear, by the Los Angeles test of not more than 45.

4. Fine aggregates shall consist of natural or crushed sand.

5. The composite material shall be free from clay, loam or other plastic material, and shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
2 inch	100
1-1/2 inch	70 - 100
¾ inch	50 - 85
No. 4	30 - 55
No. 50	8 - 24
No. 200	3 - 10

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Material Specifications

3.20.9 Sand

1. Aggregate for sand shall consist of clean, inert, hard, durable grains of quartz or other hard durable rocks and free from vegetable matter, lumps or balls of clay and other deleterious substances.

2. Sand shall confirm to ASTM C33 for fine aggregate.

3. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
1/2 inch	100
3/8 inch	85 - 100
No. 4	60 - 100
No. 16	35 - 80
No. 50	10 - 55
No. 200	2 - 10

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Material Specifications

3.20.10Excavatable Flowable Fill

1. Excavatable Flowable fill shall be 100 PSI maximum.
2. Excavatable Flowable shall consist of Portland cement conforming to ASTM C-150, Type II.
3. Excavatable Flowable may have coarse and fine aggregate consisting of well graded crushed stone.
4. Excavatable Flowable shall have **NO** fly ash.
5. Excavatable Flowable shall have clean water free from oils, acid, and organic matter.

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Material Specifications

3.20.11 Non-Excavatable Flowable Fill

1. Non-Excavatable Flowable fill shall be 150 PSI minimum.
2. Non-Excavatable Flowable fill shall consist of Portland cement conforming to ASTM C-150, Type II.
3. Non-Excavatable Flowable fill may have coarse and fine aggregate consisting of well graded crushed stone.
4. Non-Excavatable Flowable fill shall have **NO** fly ash.
5. Non-Excavatable Flowable fill shall have clean water free from oils, acid, and organic matter.

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Material Specifications

3.20.12Concrete for Fill

1. Concrete shall be 2500 PSI
2. Concrete shall be of Portland cement conforming to ASTM C-150, Type II,
3. Concrete shall have coarse aggregate consisting of well graded crushed stone with a maximum size of 2-inch
4. Concrete shall have clean water free from oils, acid, and organic matter.

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Material Specifications

3.20.13Concrete for Thrust Blocks

1. Concrete shall be 4000 PSI
2. Concrete shall be of Portland cement conforming to ASTM C-150, Type II,
3. Concrete shall have coarse aggregate consisting of well graded crushed stone with a maximum size of ¾-inch
4. Concrete shall have clean water free from oils, acid, and organic matter.

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Material Specifications

CHAPTER 4 WATER SERVICES, AND APPURTANANCES,

Section 4.1 DUCTILE IRON PUSH-ON JOINT WATER SERVICE PIPE

1. Ductile Iron water service pipe shall be at least 6-inches in diameter.

2. Ductile Iron water service pipe, ductile iron valves, and ductile iron appurtenances shall be as specified in Section 3.1 of these Specifications.

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Material Specifications

Section 4.2 COPPER TUBE WATER SERVICE PIPE

4.2.1 General

1. Copper tube water service pipe provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Copper tube water service pipe as a minimum shall conform to the most current American Water Works Association Standard C-800, all addenda thereto and American Section of the International Association for Testing Materials (ASTM) B88, all addenda thereto.

3. Copper tube water service pipe shall be seamless, type "K", and copper alloy UNS C12200.

4. Copper tube water service pipe shall be NSF 61 compliant.

5. Copper tube water service pipe shall be ¾-inch, 1-inch, 1-1/4-inch, 1-1/2-inch, and 2-inch diameter.

   (a) Please note ¾-inch and 1-1/4-inch diameters are for repair work only.

   (b) The minimum diameter for new service pipe is 1-inch

   (c) 1-1/2 and 2-inch are for new service pipe.

6. Copper tube shall be delivered in the following lengths as required by the Commission at time of order:

   (a) ¾-inch and 1-inch shall be in 40-foot and/or 60-foot rolls

   (b) 1-1/4-inch, 1/-1/2-inch, and 2-inch shall be in 20-foot straights, 40-foot and/or 60-foot rolls

   - Please note that rolls of copper tube shall be soft copper and straights of copper tube shall be hard

7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

(c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

(d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

8. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the hydrants.

9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

10. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

4.2.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

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Material Specifications

(a) Cross sectional drawings of the hydrant showing overall dimensions,

(b) Material specifications for each component,

(c) Coating applied to each component, if applicable,

(d) Weight of each component and total weight for each bury depth, and

(e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a warranty for the copper tube that states that the copper tube shall be free from all defects in material and workmanship under normal use of the product for a minimum thirty (30) year time period from time of delivery. The manufacturer shall replace and/or repair defective copper tube for a minimum thirty (30) year time period from time of delivery.

7. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed hydrant have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-502. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (a) Approved means the contractor can supply the material as shown on the drawing(s).

   (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

4.2.3 Copper Tube Approved for use by the Commission

The following manufacturers and products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Cambridge-Lee – Standard Tube
2. Cerro Flow – Cerro Tube
3. Great Lakes Copper – Great Lakes Tube
4. Mueller – Certified Tube
5. Equal provided the products are manufactured as per these specifications.

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Material Specifications

Section 4.3 TAPPING SADDLES

4.3.1 General

1. Tapping saddles provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Tapping saddles as a minimum shall conform to the most current American Water Works Association Standard C-800, all addenda thereto and American Section of the International Association for Testing Materials (ASTM) A536 and ASTM A703, all addenda thereto

3. Bodies shall be constructed of high strength ductile iron per ASTM A536.

4. Tapping saddle outlets shall have Mueller CC thread.

5. Bands shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel lugs and sidebars welded to the band(s) per ASTM A703. Single bands shall be 3-1/4-inch minimum width and double bands shall be 2-inches minimum width each.

6. Lugs and sidebars shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel fasteners welded to the lugs and sidebars. A minimum of two (2) lugs per single side bar or one (1) lug per side bar, when tapping saddles are provided with two (2) side bars, shall be provided.

7. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

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Material Specifications

9. All welds used in the construction of the tapping saddles shall conform to all American Welding Society (AWS) codes. All welds shall be fully passivated in order to restore the stainless steel to its original corrosive resistant characteristics.

10. Tapping saddles shall be provided with gaskets constructed of Virgin STYRENE BUTADIENE RUBBER (SBR) compound for water service and must meet or exceed ASTM-D-2000-AA-415.

11. Ranges must be clearly labeled on the package as well as on each tapping saddle.

12. Range diameter information must be provided from vendor on the tapping saddle bid.

13. Coatings shall be fusion bonded epoxy (10 – 12 mils), nylon 11 (10 – 12 mils)

14. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

    (a) North America shall mean the United States, Canada, and Mexico,

    (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

    (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

    (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

    (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

15. Delivery shall be specified in terms of number of days from receipt of order.

16. The manufacturer/vendor/shipper must use care in preparing tapping saddle for shipment and in handling during shipment and delivery, to insure that the tapping saddle are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged tapping saddle will not be accepted.

17. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the tapping saddle and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

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Material Specifications

4.3.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the hydrant showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight for each bury depth, and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a warranty for the tapping saddles that states that the tapping saddles shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective tapping saddles for a minimum one (1) year time period from time of delivery.

7. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed hydrant have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-800. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

   (a) Approved means the contractor can supply the material as shown on the drawing(s).

   (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

   (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

4.3.3 Tapping Saddles Approved for use by the Commission

The following manufacturers and products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Ford - FC202,
2. Mueller - DR2S,
3. Romac - 202NS
4. Smith Blair – 317A or,
5. Equal provided the products are manufactured as per these specifications.

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Material Specifications

Section 4.4 WATER SERVICE APPURTENANCES

4.4.1 General

1. Water service appurtenances i.e. valves and fittings provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Water service appurtenances i.e. valves and fittings, shall conform to the most current American Water Works Association Standard C-800, all addenda thereto.

3. All valves and fittings, which come in contact with water, shall be made from Lead Free brass.

   (a) This brass alloy is commercially called "Enviro Brass II", "Federalloy", "Selenium Free", or "Red-Hed Lead Free Brass"

   - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
   - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
   - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
   - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.

   (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.

   (c) Lead Free brass is defined as having the following content:

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	85.0-91.0
Tin (Sn)	4.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-6.0
Bismuth (Bi)	1.6-3.5.2
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0

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Material Specifications

4. All castings shall be clearly identified as being cast from Lead Free Brass.

   (a) "EB", "EBII", "NL", or "LF" are acceptable identifiers, and must be cast in high relief or deeply engraved.

   (b) Lead Free identifiers other than "EB", "EBII", "NL", or "LF" are subject to Commission review and approval.

5. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

6. All water service valves and fittings shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

7. Valves and fittings shall be designed to withstand working pressure of a minimum of 150 PSI. The manufacturer shall factory test all valves and fittings (100%) to a minimum of 150 PSI.

8. Corporation Stop Valves may rotate 360 degrees in either direction or rotate ¼ turn only and **OPEN LEFT,** counter-clockwise.

9. Curb Stop Valves shall rotate ¼ turn only and **OPEN LEFT,** counter-clockwise.

10. Valves, fittings, and other service line materials shall be as manufactured by the manufacturers of equivalent products are specified in Section 3.2.10 Table of Equivalencies and Item Number Details or the approved equal of another manufacturer.

11. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

    (a) North America shall mean the United States, Canada, and Mexico,

    (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

    (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

    (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

12. The manufacturer and/or vendor must use care in preparing materials for shipment and in handling during shipment and delivery, to insure receipt without damage. Damaged materials will not be accepted.

4.4.2 Ball Type Corporation Stops for New Installations (Items # 1, 2, 3, & 4)

1. Corporations shall include a Tee Head Adapter. Tee head adapters shall be secured to the corporation with a stainless steel set screw or rolled pin. Cotter pins are not acceptable.

2. Corporations shall have AWWA/CC (corporation cock) Taper Thread Inlet x Mueller 110 Compression Outlet.

3. The outlet thread (male) of compression joint must be capable of installation using a Mueller B-101 Drilling and Tapping Machine using an inserting tool for corporation stop, inside thread CTS Mueller 110 Conductive Compression Connection according to the following table:

INSERTING TOOL SIZE	MUELLER PART NUMBER
¾"	680600
1"	680601
1¼"	
1½"	680421
2"	680422

4. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.

5. ALL corporations shall be subject to a sustained hydraulic pressure of 200 PSI and tested in both the open and closed positions for leakage and ease of turning.

4.4.3 Ball Type Curb Stops used at Property Line (Items # 5, 6, 7, & 8)

1. Curb stops shall have Mueller 110 Compression – both ends

2. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.

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4.4.4 Ball Type Curb Stops for Service Replacements (Items # 9, 10, 11, & 12)

1. Curb stops shall have Female Iron Pipe Thread (FIP) Inlet x Mueller 110 Compression Outlet.

2. Equality of the outlet joint to the "Mueller 110 Compression" is mandatory. The "Quick Joint" (Ford), "McQuick Compression" (McDonald), and "CB Compression" (Cambridge) have been determined to be equal. (changed 08/11/03)

4.4.5 Straight Ball Meter Valves (Items # 13, 14, 15, & 16)

1. Straight ball meter valves shall have Mueller 110 Compression Inlet x Elliptical Meter Flange Outlet (Items 15 & 16) or Meter Swivel Nut (Items 13 & 14).

2. Equality of the outlet joint to the "Mueller 110 Compression" is mandatory. The "Quick Joint" (Ford), "McQuick Compression" (McDonald), and "CB Compression" (Cambridge) have been determined to be equal.

3. Straight ball meter valves shall be supplied with locking tabs.

4. Straight ball meter valves shall be provided with factory installed handles made of water works brass 85-5-5-5.

4.4.6 Straight Ball Meter Valves to Locate meter near wall (Items # 36, & 37)

1. Straight ball meter valves shall have Female Iron Pipe (FIP) X Elliptical Meter Flange (Items 36 & 37).

2. Straight ball meter valves shall be supplied with locking tabs.

3. Straight ball meter valves shall be provided with factory installed handles (85-5-5-5 brass).

4.4.7 Angled Ball Meter Valves (Items # 17, 18, 19, & 20)

1. Angled ball meter valves shall have Mueller 110 Compression Inlet x Meter Swivel Nut (Items 17 & 18) or Elliptical Meter Flange (Items 19 & 20).

2. Equality of the outlet joint to the "Mueller 110 Compression" is mandatory. The "Quick Joint" (Ford), "McQuick Compression" (McDonald), and "CB Compression" (Cambridge) have been determined to be equal.

3. Angled ball meter valves shall be supplied with locking tabs.

4. Angled ball meter valves shall be provided with factory installed handles (85-5-5-5 brass).

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4.4.8 Quick Joint Couplings (Items # 21, 22, 23, & 24)

1. Quick joint couplings shall have Mueller 110 Compression end – both ends

2. Equality of the outlet joint to the "Mueller 110 Compression" is mandatory. The "Quick Joint" (Ford), "McQuick Compression" (McDonald), and "CB Compression" (Cambridge) have been determined to be equal.

4.4.9 Handles for Meter Ball Valves (Items # 28, 29, 30 & 31)

1. Handles shall be water works brass 85-5-5-5.

2. Handle shall be provided with brass nut and bolt.

3. Meter Ball Valves the handle shall be a straight lever and a minimum of 4-1/4" long.

4.4.10 90-degree Elbows (Items # 32 & 33)

1. 90-degree elbow shall be 1-1/2-inch or 2-inch

2. 90-degree elbow shall have Mueller 110 Compression inlet x MIP on the outlet end

3. Equality of the outlet joint to the "Mueller 110 Compression" is mandatory. The "Quick Joint" (Ford), "McQuick Compression" (McDonald), and "CB Compression" (Cambridge) have been determined to be equal.

4.4.11 Elliptical Flange (Items # 34 & 35)

1. Elliptical Flange shall 1-1/2-inch or 2-inch.

2. Elliptical flange shall have FIP threads.

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4.4.12 Service Line Materials Table of Equivalencies

1. For lead free brass goods add the following to the listed Catalog Numbers below.

   (a) Ford add “NL” as a suffix to the catalog number

   (b) Red Hed supplies lead free only brass goods

   (c) Mueller add “EB” as a suffix to the catalog number.

   (d) McDonald add “7” as a prefix to the catalog number.

   (e) Cambridge add “NL” as a prefix to the catalog number.

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SECTION	ITEM #	SIZE IN & OUT	CATALOG NUMBER					NOTES
			FORD	RED HED	MUELLER	MCDONALD	CAMBRIDGE	
4.2.2	1	1"	FB1000-4-Q-TA-NL	RHSB43821	B25008N	4104BQ 1"	311-A4H4	COMB CORP & CURB STOP CC x Q
	2		FB1000-5-Q-TA-NL	NA	NA	NA	NA	CC x Q
	3	1½"	FB1000-6-Q-TA-NL	RHSB43824	B25008N 1½"	4104BQ 1½"	311-A6H6	CC x Q
	4	2"	FB1000-7-Q-TA-NL	RHSB43825	B25008N 2"	4104BQ 2"	311-A7H7	CC x Q
4.2.3	5	1"	B44-444-Q-NL	RHSB41512	B25209N	6100Q 1"	202-H4H4	CURB STOP Q x Q
	6	1¼"	B44-555-Q-NL	RHSB41513	NA	6100Q 1¼" x 1"	202-H5H5	Q x Q
	7	1½"	B44-666-Q-NL	RHSB41514	B25209N 1½"	6100Q 1½"	202-H6H6	Q x Q
	8	2"	B44-777-Q-NL	RHSB41515	B25209N 2"	6100Q 2"	202-H7H7	Q x Q
4.2.4	9	1"	B41-444-Q-NL	RHSB40812	B25172N	6102Q 1"	202-H4F4	CURB STOP FIP x Q
	10	1¼"	B41-555-Q-NL	RHB40813	NA	NA	202-H5F5	FIP x Q
	11	1½"	B41-666-Q-NL	RHB40814	B25172N 1½"	6102Q 1½"	202-H6F6	FIP x Q
	12	2"	B41-777-Q-NL	RHB40815	B25172N 2"	6102Q 2"	202-H7F7	FIP x Q
4.2.5	13	1 x ¾"	B43-342W-Q-NL	NA	B24350N	6100MWQ 1"	NA	STR. METER VALVE Q x SWIVEL
	14	1¼ x 1"	B43-454W-Q-NL	NA	B24350N	NA	NA	Q x SWIVEL
	15	1½"	BF43-666W-QNL	NA	B24335N 1½"	6100MWQ 1½"	212-H6MF6H	Q x MTR FLGE
	16	2"	BF43-777W-QNL	NA	B24335N 2"	6100MWQ 2"	212-H7MF7H	Q x MTR FLGE
4.4.6	36	1½"	BF13-666W-NL	NA	B24337N 1½"	6101MW 1½"	212-F6MF6H	FIP x MTR FLGE
	37	2"	BF13-777W-NL	NA	B24337N 2"	6101MW 2"	212-F7MF7H	FIP x MTR FLGE
4.2.7	17	1 x ¾"	BA43-342W-QNL	NA	B24258N	4602BQ 1 x ¾"	210-H4T3H	ANGLE METER VALVE Q x SWIVEL
	18	1 x 1"	BA43-444W-QNL	NA	B24258N	4602BQ 1"	210-H4T4H	Q x SWIVEL
	19	1½"	BFA43-666W-QNL	NA	B24276N 1½"	4602BQ 1½"	210-H6MF6H	Q x MTR FLGE
	20	2"	BFA43-777W-QNL	NA	B24276N 2"	4602BQ 2"	210-H7MF7H	Q x MTR FLGE

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SECTION NUMBER	ITEM #	SIZE IN & OUT	CATALOG NUMBER					NOTES
			FORD	RED HED	MUELLER	MCDONALD	CAMBRIDGE	
4.2.8	21	1"	C44-44-QNL	RH41212	H15403	4758Q 1"	119-H4H4	COUPLING Q x Q
	22	1¼"	C44-55-QNL	RH41213	H15403N	4758Q 1¼"	119-H5H5	Q x Q
	23	1½"	C44-66-QNL	RH41214	H15403N 1½"	4758Q 1½"	119-H6H6	Q x Q
	24	2"	C44-77-QNL	RH41215	H15403N 2"	4758Q 2"	119-H7H7	Q x Q
4.4.9	28	¾" & 1"	HB34	NA	B-20298	6120B 1"	NA inc. w/ valve	Brass Handle
	29	1¼"	HH67S	NA	B-20298	6120B 1¼"	NA inc. w/ valve	Brass Handle
	30	1½"	HH67S	NA	B-20298	6120B 1½"	NA inc. w/ valv	Brass Handle
	31	2"	HH67S	NA	B-20298	6120B 2"	NA inc. w/ valv	Brass Handle
4.4.10	32	1½"	L84-66-QNL	NA	H15531N 1½"	4779M-22 1½"	105-H6M6NL 1½"	Elbow
	33	2"	L84-77-QNL	NA	H1553N 2"	4779M-22 2"	105-H6M6NL 2"	Elbow
4.4.11	34	1½"	CF31-66NL	NA	H10129N 1½"	610F 1½"	421-6-NL 1½"	Ellip. Flange
	35	2"	CF31-77NL	NA	H10129N 2"	610F 2"	421-6-NL 2"	Ellip. Flange
3.2.8	25	3 ½’	NA	NA	NA	NA	NA	Buffalo style curb box in street for 1-inch valves
	26	6’	NA	NA	NA	NA	NA	Buffalo style curb box @ property for 1-incn valves
	27	3 ½’	NA	NA	NA	NA	NA	Buffalo style curb box in street for 1-1/2 to 2-inch valves
	27a	6’	NA	NA	NA	NA	NA	Buffalo style curb box @ property for 1-1/2 to 2-incn valves

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Section 4.5 WATER SERVICE BOXES

4.5.1 General

1. Water service boxes provided to the Commission or installer shall be Buffalo/slide style and manufactured, tested, inspected and delivered in full compliance with this Specification.

2. The Water service boxes shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements.

3. Water service boxes shall be strong, durable, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

   (a) An HS20 load rating is required.

   (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.

   (c) Water service boxes covers and seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.

4. The Commission may require water service boxes be subjected to proof load testing as follows:

   (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.

   (b) Water service boxes shall show no detrimental deformation or cracks when a proof load of 25,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

   (c) Permanent deformation shall not exceed 1/8-inch.

   (d) All testing shall be at the supplier's expense.

5. Water service boxes top sections, bottom sections, covers, and enlarged bases shall be provided with individual permanent markings that are easily discernable and show the following:

   (a) Name of the producing foundry and country of manufacture preceded by the words "Made in", such as "Made in USA"

   (b) AASHTO designation or ASTM designation number

(c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,

(d) Heat identification and cast date (MM/DD/YY),

(e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

6. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

7. All water service boxes tops, bottoms, and covers shall be coated with an approved petroleum asphaltic seal coat.

8. The manufacturer/vendor/shipper must use care in preparing valves boxes for shipment and in handling during shipment and delivery, to insure that the valves boxes are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged valves boxes will not be accepted.

9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the valve and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

4.5.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

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2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the product(s) showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer and/or vendor of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer and/or vendor shall furnish a letter certifying the product(s) meet all the requirements of the AIS, an explanation, in the letter, of how the product(s) meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor shall furnish a certified statement that all product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer and/or vendor shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer and/or vendor shall replace and/or repair defective parts or the whole product(s) for a minimum one (1) year time period from time of delivery.

8. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements, American Society of Testing and Materials (ASTM)

A48, Class 35B, and as the Commission may require the National Institute of Standards Technology (NIST) standards – Proof Load Testing.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

4.5.3 Buffalo Style Service Box (Items # 25, 26, 27, & 27a) for New and Existing Services

1. The Buffalo Style Service Box shall be heavy cast iron extension (adjustable) type, slide style, with arch pattern base and a recessed cover.

2. The Buffalo Style Service Box shall be 5-feet tall, with an approximate 24-inch top, an approximate 48-inch bottom, and weigh at least 41-pounds with top section, bottom section, and cover.

3. For ¾-inch to 1-inch ball type corporations and ball type curb stops the arch shall be at least 5-inches tall with a 3-inch by 3-inch arch.

4. For 1-1/2-inch to 2-inch ball type corporations and ball type curb stops an enlarged base is be required and the arch shall be at least 7-inches tall with a 4-inch by 4-inch arch.

5. The inside diameter of the upper section shall be at least 3-inches. The inside diameter of the bottom section shall be at least 2-1/2-inches.

6. The Buffalo Style Service Box shall be provided with a heavy duty, flush fit, cast iron cover that has a brass pentagon head nut, and the word "WATER" cast into the cover.

7. The Buffalo Style Service Box shall have a heavy coat of Asphalt-base paint.

4.5.4 Buffalo Style Water Service Boxes Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

8. Bibby Ste-Croix:

   (a) Water Service Box complete: V042 (95E)

   (b) Top section only: S201,

   (c) Bottom section only: V213,

   (d) Enlarged base: V313,

   (e) Heavy duty cover: V243, and

   (f) Brass bolt: V312

9. Bingham and Taylor:

   (a) Water Service Box complete: 94-F (Fig. 4901)

   (b) Top section only: F (Fig. 4901),

   (c) Bottom section only: 94 (Fig. 4901),

   (d) Enlarged base: 14-E (Fig. 4980)

   (e) Heavy duty cover: 4901-B, and

   (f) Brass bolt: 4951, or

10. Equal provided the products are manufactured as per these specifications.

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Section 4.6 Water Meters: 5/8-inch – 1-inch

4.6.1 General

1. Water Meters shall conform to the American Water Works Association Standard C-700 (latest edition) for: "Cold Water Meter—Positive Displacement Type, Bronze Main Case".

   (a) The register shall be supplied mounted to the meter body.

   (b) Registers may be mechanical or solid state

2. The Water Meter shall be supplied and warranted as a complete assemble unit that include the meter body, encoder register, and 8-foot cord.

3. All water meters shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

4. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

5. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer and/or vendor with the provisions of

the specifications, shall be paid for by the manufacturer and/or vendor, and shall be deductible from the price paid for the water meters.

6. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

7. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.

8. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

4.6.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the Water Meters showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each finished product(s), and

   (e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer and/or vendor of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

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4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer and/or vendor shall furnish a certified statement that all Water Meters of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer and/or vendor shall furnish a certified statement, by an accredited third party certification organization, that the water meter is suitable for contact with drinking water in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

8. The manufacturer and/or vendor shall furnish a warranty for the water meters that states that the water meters shall be free from all defects in material and workmanship under normal use in accordance with the following requirements:

   (a) Lead free bronze housing for a minimum twenty (20) year time period from time of delivery,

   (b) Encoder registers which are supplied with the water meters for a minimum ten (10) year time period from time of delivery,

   (c) The supplier of the Water Meter unit shall be fully responsible for all components and warrantees of the Water Meter unit and shall replace and/or repair defective parts or the whole water meter.

9. The manufacturer and/or vendor shall furnish a warranty for the water meters accuracy that states that the water meters shall meet or exceed AWWA Standard C-700, latest edition, under normal use in accordance with the following requirements:

   (a) 5/8-inch by ¾-inch for a minimum five (5) year time period from time of delivery or 100,000-cubic feet (750,000-gallons), whichever occurs first,

   (b) 1-inch for a minimum five (5) year time period from time of delivery or 133,333-cubic feet (1,000,000-gallons), whichever occurs first,

   (c) The manufacturer and/or vendor shall replace and/or repair defective parts or the whole water meter.

10. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed water meter have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-700. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

11. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

12. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

4.6.3 Meter Body

1. The main meter body shall be rated for a minimum 150 psi continuous working pressure.

2. Measuring chamber shall be a nutating disc.

3. Coupling connections shall be standard National Pipe Thread (NPT) with the following connection types required:

    (a) 5/8-inch by ¾-inch: Male Thread Ends (MTE),

    (b) 1-inch: MTE,

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4. A frost-protection type cast iron base plate is required for 5/8-inch and 1-inch meters and shall be attached with stainless screws.

   (a) The base plate shall be coated with epoxy paint.

   (b) A minimum of two (2) base screws will contain an eyelet suitable for inserting a wire tamper-evident seal.

5. All brass components which come in contact with water shall be made from Lead Free brass.

   (a) This brass alloy is commercially referred to as "Enviro Brass II", "Federalloy", "Selenium Free", or "Red-Hed Lead Free Brass"

   - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
   - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
   - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
   - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.

   (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.

   (c) Lead Free brass is defined as having the following content:

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	85.0-91.0
Tin (Sn)	4.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-6.0
Bismuth (Bi)	1.6-3.5.2
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0

6. The meter body casting shall be clearly and deeply engraved with a unique 8 digit serial number which can be readily translated to determine the date of manufacture and shall be clearly identified as being cast from Lead Free Brass.

(a) "EB", "EBII", "NL", or "LF" are acceptable identifiers, and must be cast in high relief or deeply engraved.

(b) Lead Free identifiers other than "EB", "EBII", "NL", or "LF" are subject to Commission review and approval.

7. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

4.6.4 Mechanical Register

1. The register shall be an encoder type with an encoded output, tamper-resistant (tamper-evident seal pin or seal wire screw), magnetically driven, and permanently sealed against moisture (1-100% operating humidity) and dirt.

2. Registers shall be a direct-read mechanical odometer wheel that registers in cubic feet.

   (a) 5/8-inch through 1-inch shall be six (6) digits to the cubic foot decimal point with up to four (4) digits allowed after the decimal point.

3. Compatibility is required with any UI-1203 (such as provided by Sensus) protocol three (3) wire input devices.

4. The register shall have a minimum 8-foot encoded potted lead wire for attachment to external electronics.

4.6.5 Solid State Register

1. The register shall be a solid state LCD display tamper-resistant (tamper-evident seal pin or seal wire screw), magnetically driven, and permanently sealed against moisture and dirt.

2. The register shall have no internal battery.

3. Registers shall be direct-read LCD numeric; registering in cubic feet.

   (a) 5/8-inch through 1-inch shall be six (6) digits to the cubic foot decimal point with up to four (4) digits allowed after the decimal point.

4. Compatibility is required with any UI-1203 (such as provided by Sensus) protocol three (3) wire input devices.

5. The register shall have a minimum 8-foot encoded potted lead wire for attachment to external electronics

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4.6.6 Manuals, Spare Parts, Tools, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.

2. The manufacturer and/or vendor shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the water meter components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.

3. The manufacturer and/or vendor shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.

4. The manufacturer and/or vendor shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of meters.

5. The manufacturer and/or vendor shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.

6. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.

4.6.7 Water Meter Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Badger Meter, Inc.:

   (a) 5/8-inch by ¾-inch w/ MTE: Model 25 w/ HR-E Encoder Register,

   (b) 1-inch w/ MTE: Model 55 w/ HR-E Encoder Register,

2. Neptune:

   (a) 5/8-inch by ¾-inch w/ MTE: T-10 Pro Read Register,

(b) 1-inch w/ MTE: T-10 Pro Read Register,

(c) 5/8-inch by ¾-inch w/ MTE: w/ E-CODER Solid State Register

(d) 1-inch w/ MTE: w/ E-CODER Solid State Register

3. Equal provided the products are manufactured as per these specifications.

Section 4.7 Single Jet Water Meters – 5/8-inch X ¾-inch, 1-inch, 1-1/2-inch, 2-inch, 3-inch, and 4-inch and Replacement Registers

4.7.1 General

1. Water Meters shall conform to the American Water Works Association Standard C-712 (latest edition) for: "Cold-Water Meters-Single-jet Type" and the following.

2. The Water Meter shall be supplied and warranted as a complete assembled unit that includes the meter body, liquid crystal display (LCD) register and 3-foot cord or longer with an Itron connector compatible with Encoder-Receiver-Transmitters (ERT).

3. Water meters shall operate accurately with no requirements for straight runs of pipe before or after the meter.

4. Water meters shall operate without any leakage or damage to any part at a minimum continuous working pressure of 230-PSI (16-Bar).

5. Water meters shall be bid without strainers. The water meter operations shall be unaffected by sand or other particulate in the flow path. The manufacturer must warranty the meter operation and accuracy with no strainer installed.

6. All water meters shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,

(c) Incidental parts may be purchased/obtained from other counties to provide a finished product, in accordance with these Material Specifications, and

(d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

8. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer and/or vendor with the provisions of the specifications, shall be paid for by the manufacturer and/or vendor, and shall be deductible from the price paid for the water meters.

9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

10. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

4.7.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All

components shall be provided in accordance to these drawings. The drawings shall show the following:

(a) Cross sectional drawings of the Water Meters showing overall dimensions,

(b) Material specifications for each component,

(c) Coating applied to each component, if applicable,

(d) Rated working pressure and hydrostatic test pressure of each finished product(s), and

(e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

4. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

5. The manufacturer and/or vendor shall furnish a certified statement that all Water Meters of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

6. The manufacturer and/or vendor shall furnish a certified statement, by an accredited third party certification organization, that the water meter is suitable for contact with drinking water in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

7. The manufacturer and/or vendor shall furnish a warranty for the water meters that states that the water meters shall be free from all defects in material and workmanship under normal use in accordance with the following requirements:

   (a) Lead free bronze main case for a minimum twenty (20) year time period from time of delivery,

   (b) Registers which are supplied with the water meters for a minimum five (5) year time period from time of delivery,

   (c) All other components which are supplied with the water meter for a minimum of five (5) year time period from time of delivery,

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(d) The supplier of the Water Meter unit shall be fully responsible for all components and warrantees of the Water Meter unit and shall replace and/or repair defective parts or the whole water meter.

8. The manufacturer and/or vendor shall furnish technical documentation for the water meters performance and accuracy that states that the water meters shall meet or exceed AWWA Standard C-712, latest edition, under normal use in accordance with Table 1, below.

   (a) The manufacturer and/or vendor shall furnish a warranty for the 5/8-inch X 3/4-inch, 1-inch, 1-1/2-inch, 2-inch, 3-inch, and 4-inch water meters accuracy that states that the water meters shall meet or exceed AWWA Standard C-712, latest edition, and in accordance with Table 1 below for a minimum five (5) year time period from time of delivery,

   (b) The manufacturer and/or vendor shall replace and/or repair defective parts or the whole water meter.

9. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed water meter have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-712. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification, if applicable, “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the material as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

(c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

4.7.3 Meter Body – Main Case

1. The meter body shall be lead free brass as defined elsewhere in these specifications.

   (a) 5/8-inch X ¾-inch meters shall have composite meter chamber.

   (b) 1-inch and larger shall have all brass meter chambers.

2. The meter body case shall have the meter serial number, size, an arrow indicating direction of flow, and identification of the main case as being lead free permanently cast, etched, or stamped on the main case.

   (a) The unique multi digit serial number shall be readily translated to determine the date of manufacture.

   (b) The size and an arrow indicating direction of flow shall be cast in raised characters on the main case.

3. The main case shall be of top loading design to facilitate meter access.

   (a) 5/8-inch X ¾-inch meters shall have the cover fastened to the main case by standard torx head bolts such that standard tools can be used to remove the cover.

   (b) 1-inch and larger meters shall have the cover fastened to the main case by standard hex-head bolts such that standard tools can be used to remove the cover.

4. Meters shall utilize only one (1) measuring element, which shall be an impeller style, to achieve the performance required in the table below.

   (a) No meters using two (2) or more measuring elements, such as combination meters or compound meters shall be accepted.

   (b) 100% of water flow must be directly measured by the single-jet element to achieve performance in above table.

   (c) Propeller type or proportional meters shall not be accepted.

5. Meters must meet the performance specifications summarized below as well as all defined by the AWWA 712, latest edition. These requirements are summarized in Table 1;

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Table 1

ITEM	Meter Size	Register Type/ telemetry type	Low Flow GPM at least at 95% accuracy	Accuracy Range 98.5-101.5%	Maximum Pressure Loss Over Accuracy Range	Max Lay Length in Inches (including spool or extension if needed)
1	5/8 X 3/4 inch	LCD/900 MHZ RF	1/8 gpm	0.25-22 gpm	15 PSI	7.5 INCH
2	5/8 X 3/4 inch	LCD/INTEGRAL CELLULAR	1/8 gpm	0.25-22 gpm	15 PSI	7.5 INCH
3	5/8 X 3/4 inch (extended flow range)	LCD/ REMOTE CELLULAR***	1/16 gpm	0.125 - 30 gpm	15 PSI	7.5 INCH
4	5/8 X 3/4 inch (extended flow range)	LCD/900 MHZ RF plus REMOTE Register with onboard CELLULAR	1/16 gpm	0.125 - 30 gpm	15 PSI	7.5 INCH
5	1 inch	LCD/900 MHZ RF	1/8 gpm	0.5-70 gpm	15 PSI	10.75 INCH
6	1 inch	LCD/INTEGRAL CELLULAR	1/8 gpm	0.5-70 gpm	15 PSI	10.75 INCH
7	1 inch	LCD/ REMOTE CELLULAR***	1/8 gpm	0.5-70 gpm	15 PSI	10.75 INCH
8	1-1/2 inch	LCD/900 MHZ RF	1/4 gpm	0.5-105 gpm	15 PSI	8 INCH
9	1-1/2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.5-105 gpm	15 PSI	8 INCH
10	1-1/2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.5-105 gpm	15 PSI	8 INCH
11	1-1/2 inch	LCD/900 MHZ RF	1/4 gpm	0.5-105 gpm	15 PSI	13 INCH*
12	1-1/2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.5-105 gpm	15 PSI	13 INCH*
13	1-1/2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.5-105 gpm	15 PSI	13 INCH*
14	2 inch	LCD/900 MHZ RF	1/4 gpm	0.75-165 gpm	15 PSI	10 INCH
15	2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.75-165 gpm	15 PSI	10 INCH
16	2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.75-165 gpm	15 PSI	10 INCH
17	2 inch	LCD/900 MHZ RF	1/4 gpm	0.75-165 gpm	15 PSI	17 INCH*
18	2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.75-165 gpm	15 PSI	17 INCH*
19	2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.75-165 gpm	15 PSI	17 INCH*
20	3 inch	LCD/900 MHZ RF	1/2 gpm	0.75-350 gpm	15 PSI	12 INCH
21	3 inch	LCD/INTEGRAL CELLULAR	1/2 gpm	0.75-350 gpm	15 PSI	12 INCH
22	3 inch	LCD/ REMOTE CELLULAR***	1/2 gpm	0.75-350 gpm	15 PSI	12 INCH
23	3 inch	LCD/900 MHZ RF	1/2 gpm	0.75-350 gpm	15 PSI	17 INCH**
24	3 inch	LCD/INTEGRAL CELLULAR	1/2 gpm	0.75-350 gpm	15 PSI	17 INCH**
25	3 inch	LCD/ REMOTE CELLULAR***	1/2 gpm	0.75-350 gpm	15 PSI	17 INCH**
26	4 inch	LCD/900 MHZ RF	3/4 gpm	1.5-500 gpm	15 PSI	14 INCH
27	4 inch	LCD/INTEGRAL CELLULAR	3/4 gpm	1.5-500 gpm	15 PSI	14 INCH
28	4 inch	LCD/ REMOTE CELLULAR***	3/4 gpm	1.5-500 gpm	15 PSI	14 INCH
29	4 inch	LCD/900 MHZ RF	3/4 gpm	1.5-500 gpm	15 PSI	20 INCH**
30	4 inch	LCD/INTEGRAL CELLULAR	3/4 gpm	1.5-500 gpm	15 PSI	20 INCH**
31	4 inch	LCD/ REMOTE CELLULAR***	3/4 gpm	1.5-500 gpm	15 PSI	20 INCH**
32	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only				
33	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only with 3' Itron ERT Connector				
34	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only with wired remote anntenna (15 to 25 ft); length at customer's request				

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35	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only with wired remote antenna (15 to 25ft); length at customer's request and also with a two wire configurable (SCADA compatible) pulse output
36	universal ****	universal IV REMOTE Register for attachment to 3 wire industry standard AMR encoded meter output
37	universal ****	15ft to 50ft (length at customer's request) LCD Cellular Network equipped register only
38	universal ****	universal mounting bracket and housing for register
39	various	mounting plate and housing for register specific for Badger M series meters

* Spool pieces for 1 1/2 and 2 inch meters will have a 1" NPT test port (with plug) built in

** Spool pieces for 3 and 4 inch meters will have a 2" NPT test port (with plug) built in

***Remote is a wired Transmission Endpoint with at least a 15 foot cord and up to 25 foot as requested

**** will work at least on any size Metron model d or newer top loading spectrum and enduro meter and on badger M25 or M70 Series Bases

6. Coupling connections shall be standard National Pipe thread (NPT) with the following connection types required:

   (a) 5/8-inch X ¾-inch: Male Thread Ends (MTE)

   (b) 1-inch: MTE

7. Coupling connections shall be casing flanges with the following connection types required:

   (a) 1-1/2-inch: Two (2) bolt oval flange ends,

   (b) 2-inch: Two (2) bolt oval flange ends,

   (c) 3-inch: Four (4) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy

   (d) 4-inch: Eight (8) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy

8. Water meters shall be supplied with flange gaskets and all fasteners necessary for installation.

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9. All fasteners shall be made of Grade 316 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 316 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 316+ stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

10. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

11. All brass components which come in contact with water shall be made from Lead Free brass.

    (a) This brass alloy is commercially referred to as “Enviro Brass II”, “Federalloy”, “Selenium Free”, “Red-Hed Lead Free Brass”, or “Silicon Red Brass”

    - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
    - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
    - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
    - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.
    - Silicon Red Brass is a Lead Free copper alloy, UNS Copper Alloy C69430.

    (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.

    (c) Lead Free brass is defined in Table 2 as having the following elemental content(s):

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Table 2

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	81.75-91.0
Tin (Sn)	0.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-14.0
Bismuth (Bi)	0.0-3.5
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0
Silicon (Si)	0.0-4.0

12. The meter body casting shall clearly identify the casting as being Lead Free Brass.

    (a) "EB", "EBII", "NL", or "LF" are acceptable identifiers, and must be cast in high relief or deeply engraved.

    (b) Lead Free identifiers other than "EB", "EBII", "NL", or "LF" are subject to Commission review and approval.

13. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

4.7.4 Registers

1. The registers shall be a solid state liquid filled crystal display (LCD) or solid state LCD with built-in cellular technology for reading data upload to a web based cloud environment and in accordance with these Material Specifications.

2. The registers housing and lid, if applicable, shall be made of bronze or polymer.

3. The registers shall be sealed permanently against moisture and dirt with an IP68 rating.

4. The registers shall be a solid state electronic LCD type.

5. The registers shall be magnetically driven. No intermediate gearing shall be allowed.

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6. The registers shall be tamper proof and secured to the main case in such a manner that tampering can be easily determined.

7. The registers shall be configurable for either cubic feet or gallons upon request before or after being installed by the manufacturer or the Commission.

8. The registers lens window shall be polycarbonate plastic and in accordance with the following:

   (a) The lens window shall be break resistant and scratch resistant,

   (b) No liquid filled registers shall be accepted,

   (c) UV rated cure adhesive for sealing,

   (d) Self-healing dielectric gel is required for all wire connections (potting),

   (e) The registers shall be able to withstand 100% humidity (submersible), and

   (f) The display shall have a minimum range of -4-degrees Fahrenheit (F) to +176-degrees F with an Extended Range Option available.

9. The registers shall have on-board data logging with programmable intervals from 1-minute to 1-hour and on-board memory of at least 32,000-data points.

10. The registers shall be field serviceable without interruption of the meter's operation

11. The register box must be securely attached to the main case and be securely held in place.

12. The name of the manufacturer and the units of measure shall be clearly visible and identifiable and located on the exterior of the register, register box or lid.

13. The register shall be supplied mounted to the meter body.

14. All internal components shall be of non-corrosive materials as described in AWWA C712 standard.

15. The Registers output for radio frequency (RF) shall be compatible with ITRON-60W Encoder Receive Transmitter (ERT) and unless requested or otherwise approved come with a 15-foot or longer cord terminating with an Itron connector, as indicated in Table 1 above.

16. Registers with two-way cellular based communications shall allow for data log retrieval by a device connecting by either IrDA, Bluetooth, or equal in the event that the cellular data is not available, as indicated in Table 1 above.

(g) Such device to be available from and supported by the meter manufacturer for a period of at least 10-years.

(h) Upon request a second output for either pulse or 4-20ma shall be available, as indicated in Table 1 above.

17. The maximum indications of the digits on the first display number and the minimum capacity of the register shall be as indicated in Table 3

Table 3

Meter Size	Maximum Allowable Indication of Initial Dial		Minimum allowable Capacity of Register (In million cubic-feet and million gallons)	
	Cubic Feet	Gallons	Cubic Feet	Gallons
5/8-inch X ¾-inch	0.1	1.0	1.0	10
1-inch	0.1	1.0	1.0	10
1-1/2-inch	10	100	10	100
1-1/2-inch	10	100	10	100
2-inch	10	100	10	100
2-inch	10	100	10	100
3-inch	10	100	10	100
3-inch	10	100	10	100
4-inch	100	1000	10	100
4-inch	100	1000	10	100

4.7.5 Manuals, Spare Parts, Tools, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.

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2. The manufacturer and/or vendor shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the water meter components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.

3. The manufacturer and/or vendor shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.

4. The manufacturer and/or vendor shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of meters.

5. The manufacturer and/or vendor shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.

6. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.

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4.7.6 Water Meter Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Metron-Farnier.:
   (a) 5/8-inch X ¾-inch w/ NPT MTE: Model - S-30-D (Brass)
   (b) 1-inch w/ NPT MTE; Model – Spectrum S-50-DL
   (c) 1-1/2-inch w/ Two bolt oval flange ends: Model - Spectrum S-88-D,
   (d) 2-inch w/ Two bolt oval flange ends: Model Spectrum S-130-D,
   (e) 3-inch w/ Four bolt round flange ends: Model Spectrum S-175-D,
   (f) 4-inch w/ Eight bolt round flange ends: Model Spectrum S-500-D, or
2. Equal provided the products are manufactured as per these specifications.

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Section 4.8 Single Jet Water Meters – 6-inch and 8-inch

4.8.1 General

1. Water Meters shall conform to the American Water Works Association Standard C-712 (latest edition) for: "Cold-Water Meters-Single-jet Type" and the following.

2. The Water Meter shall be supplied and warranted as a complete assembled unit that includes the meter body, liquid crystal display (LCD) register and 3-foot cord or longer with an Itron connector compatible with Encoder-Receiver-Transmitters (ERT).

3. Water meters shall operate accurately with no requirements for straight runs of pipe before or after the meter.

4. Water meters shall operate without any leakage or damage to any part at a minimum continuous working pressure of 230-PSI (16-Bar).

5. Water meters shall be bid without strainers. The water meter operations shall be unaffected by sand or other particulate in the flow path. The manufacturer must warranty the meter operation and accuracy with no strainer installed.

6. Water meters for dual fire and domestic applications shall be Factory Mutual (FM) approved.

7. All water meters shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

8. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

9. Inspection:

   (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.

   (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer and/or vendor with the provisions of the specifications, shall be paid for by the manufacturer and/or vendor, and shall be deductible from the price paid for the water meters.

10. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

11. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.

12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

4.8.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the Water Meters showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

(d) Rated working pressure and hydrostatic test pressure of each finished product(s), and

(e) Country of origin for each component.

3. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.

4. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

5. The manufacturer and/or vendor shall furnish a certified statement that all Water Meters of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

6. The manufacturer and/or vendor shall furnish a certified statement, by an accredited third party certification organization, that the water meter is suitable for contact with drinking water in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.

7. The manufacturer and/or vendor shall furnish a warranty for the water meters that states that the water meters shall be free from all defects in material and workmanship under normal use in accordance with the following requirements:

   (a) Lead free bronze main case for a minimum twenty (20) year time period from time of delivery,

   (b) Registers which are supplied with the water meters for a minimum five (5) year time period from time of delivery,

   (c) All other components which are supplied with the water meter for a minimum of five (5) year time period from time of delivery,

   (d) The supplier of the Water Meter unit shall be fully responsible for all components and warrantees of the Water Meter unit and shall replace and/or repair defective parts or the whole water meter.

8. The manufacturer and/or vendor shall furnish technical documentation for the water meters performance and accuracy that states that the water meters shall meet or exceed AWWA Standard C-712, latest edition, under normal use in accordance with Table 1, below.

   (a) The manufacturer and/or vendor shall furnish a warranty for the 6-inch and 8-inch water meters accuracy that states that the water meters shall meet or exceed

AWWA Standard C-712, latest edition, and in accordance with Table 1 below for a minimum five (5) year time period from time of delivery,

(b) The manufacturer and/or vendor shall replace and/or repair defective parts or the whole water meter.

9. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed water meter have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-712. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification, if applicable, "Approved", "Approved as Noted", or "Rejected-Resubmit" and return to the manufacturer and/or vendor.

    (e) Approved means the contractor can supply the material as shown on the drawing(s).

    (f) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

    (g) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

4.8.3 Meter Body – Main Case

1. The meter body shall be lead free brass as defined elsewhere in these specifications and shall have all brass meter chambers.

2. The meter body case shall have the meter serial number, size, an arrow indicating direction of flow, and identification of the main case as being lead free permanently cast, etched, or stamped on the main case.

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(a) The unique multi digit serial number shall be readily translated to determine the date of manufacture.

(b) The size and an arrow indicating direction of flow shall be cast in raised characters on the main case.

3. The main case shall be of top loading design to facilitate meter access and shall have the cover fastened to the main case by standard hex-head bolts such that standard tools can be used to remove the cover.

4. Meters shall utilize only one (1) measuring element, which shall be an impeller style, to achieve the performance required in the table below.

   (a) No meters using two (2) or more measuring elements, such as combination meters or compound meters shall be accepted.

   (b) 100% of water flow must be directly measured by the single-jet element to achieve performance in above table.

   (c) Propeller type or proportional meters shall not be accepted.

5. Meters must meet the performance specifications summarized below as well as all defined by the AWWA 712, latest edition. These requirements are summarized in Table 1;

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Table 1

ITEM	Meter Size	Register Type/ telemetry type	Low Flow GPM at least at 95% accuracy	Accuracy Range 98.5-101.5%	Maximum Pressure Loss Over Accuracy Range	Max Lay Length in Inches (including spool or extension if needed)
1	6 inch	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
2	6 inch (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
3	6 inch (extended flow range)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	15 gpm	15 - 3500 gpm	7 PSI	24 INCH
4	6 inch (extended flow range) (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	15 gpm	15 - 3500 gpm	7 PSI	24 INCH
5	8 inch	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
6	8 inch (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
7	8 inch (extended flow range)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	15 gpm	15 - 3500 gpm	7 PSI	24 INCH
8	8 inch (extended flow range) (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	15 gpm	15 - 3500 gpm	7 PSI	24 INCH

***Remote is a wired Cellular Transmission Antenna Endpoint with at least a 15-foot cord and up to 25-foot as requested

6. 6-inch and 8-inch meters shall have a 2-inch NPT test port (with plug) tapped in to the main body.

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7. Cellular devices shall include ten (10) years of pre-paid cellular service.

8. Coupling connections shall be casing flanges with the following connection types required:

   (a) 6-inch: Eight (8) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy

   (b) 8-inch: Eight (8) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy

9. Water meters shall be supplied with flange gaskets and all fasteners necessary for installation.

10. All fasteners shall be made of Grade 316 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 316 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 316+ stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

11. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

12. All brass components which come in contact with water shall be made from Lead Free brass.

    (a) This brass alloy is commercially referred to as “Enviro Brass II”, “Federalloy”, “Selenium Free”, “Red-Hed Lead Free Brass”, or “Silicon Red Brass”

    - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
    - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
    - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
    - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.

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- Silicon Red Brass is a Lead Free copper alloy, UNS Copper Alloy C69430.

(b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.

(c) Lead Free brass is defined in Table 2 as having the following elemental content(s):

Table 2

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	81.75-91.0
Tin (Sn)	0.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-14.0
Bismuth (Bi)	0.0-3.5
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0
Silicon (Si)	0.0-4.0

13. The meter body casting shall clearly identify the casting as being Lead Free Brass.

    (a) "EB", "EBII", "NL", or "LF" are acceptable identifiers, and must be cast in high relief or deeply engraved.

    (b) Lead Free identifiers other than "EB", "EBII", "NL", or "LF" are subject to Commission review and approval.

14. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

4.8.4 Registers

1. The registers shall be a solid state liquid filled crystal display (LCD) or solid state LCD with both a built in RF output to a three (3) wire AMR standard setup and built-in cellular technology with either an onboard or wired remote antenna for reading data upload to a web based cloud environment and in accordance with these Material Specifications.

2. The registers housing and lid, if applicable, shall be made of bronze or polymer.

3. The registers shall be sealed permanently against moisture and dirt with an IP68 rating.

4. The registers shall be a solid state electronic LCD type.

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5. The registers shall be magnetically driven. No intermediate gearing shall be allowed.

6. The registers shall be tamper proof and secured to the main case in such a manner that tampering can be easily determined.

7. The registers shall be configurable for either cubic feet or gallons upon request before or after being installed by the manufacturer or the Commission.

8. The registers lens window shall be polycarbonate plastic and in accordance with the following:

   (a) The lens window shall be break resistant and scratch resistant,

   (b) No liquid filled registers shall be accepted,

   (c) UV rated cure adhesive for sealing,

   (d) Self-healing dielectric gel is required for all wire connections (potting),

   (e) The registers shall be able to withstand 100% humidity (submersible), and

   (f) The display shall have a minimum range of -4-degrees Fahrenheit (F) to +176-degrees F with an Extended Range Option available.

9. The registers shall have on-board data logging with programmable intervals from 1-minute to 1-hour and on-board memory of at least 32,000-data points.

10. The registers shall be field serviceable without interruption of the meter's operation

11. The register box must be securely attached to the main case and be securely held in place.

12. The name of the manufacturer and the units of measure shall be clearly visible and identifiable and located on the exterior of the register, register box or lid.

13. The register shall be supplied mounted to the meter body.

14. All internal components shall be of non-corrosive materials as described in AWWA C712 standard.

15. The Registers output for radio frequency (RF) shall be compatible with ITRON-60W Encoder Receive Transmitter (ERT) and unless requested or otherwise approved come with a 15-foot or longer cord terminating with an Itron connector, as indicated in Table 1 above.

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16. Registers with two-way cellular based communications shall allow for data log retrieval by a device connecting by either IrDA, Bluetooth, or equal in the event that the cellular data is not available, as indicated in Table 1 above.

    (g) Such device to be available from and supported by the meter manufacturer for a period of at least 10-years.

    (h) Upon request a second output for either pulse or 4-20ma shall be available, as indicated in Table 1 above.

17. The maximum indications of the digits on the first display number and the minimum capacity of the register shall be as indicated in Table 3

Table 3

Meter Size	Maximum Allowable Indication of Initial Dial		Minimum allowable Capacity of Register (In million cubic-feet and million gallons)	
	Cubic Feet	Gallons	Cubic Feet	Gallons
6-inch	100	1000	99	999
8-inch	100	1000	99	999

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4.8.5 Manuals, Spare Parts, Tools, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.

2. The manufacturer and/or vendor shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the water meter components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.

3. The manufacturer and/or vendor shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.

4. The manufacturer and/or vendor shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of meters.

5. The manufacturer and/or vendor shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.

6. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.

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4.8.6 Water Meter Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Metron-Farnier.:

   (a) 6-inch w/ Eight bolt round flange ends: Model Enduro E-2800-D,

   (b) 8-inch w/ Eight bolt round flange ends: Model Enduro E-2800-D, or

2. Equal provided the products are manufactured as per these specifications.

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Section 4.9 Encoder-Receiver-Transmitters

4.9.1 General

1. Encoder Receiver Transmitters (ERT) shall conform to the American Water Works Association Standard C-712 (latest edition) for: "Cold-Water Meters-Single-jet Type" and the following.

2. All devices must be readable by drive by systems we have including the following Itron Mobile Collection (MC) devices:

3. MC3 with MV-RS v8.0 or higher and FCS with v2.2 or higher MC Lite with MV-RS v8.1or higher and FCS with v2.3 or higher

4. All devices must have data logging capability to store at least 30 days of hourly consumption information that can be read either by mobile or fixed network.

5. The read data information must be presented in a manner it can be handled by ltron's MV-RS and/or FCS applications.

6. Transmission Parameters:

7. Data message:

8. Transmissions of meter register value cut cable and or communication error tamper(s), reverse flow, and leak status messages, as well as low battery indicator must be transmitted in an interval not greater than ten seconds in mobile mode.

9. All the information above and at least the last 6 time synchronized consumption intervals must transmit at least every five minutes.

10. A 12 bit message that contains a single, cumulative meter reading value along with the meter serial number, commodity type and checksum and tamper flags must be transmitted every 60 seconds in fixed network mode

11. Transmitter frequencies:

    (a) 908 - 924 MHz in Mobile drive by mode

    (b) 903 - 926.8 MHz in fixed network mode

12. Must operate in bubble-up mode and not require a license from the Federal Communications Commission FCC Part 15.247

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13. Operating temperature for basement applications must be -40°C to +60°C Humidity limits: 0 to 100% (submersible)

14. Compatibility: Badger Meter s with ADE Registers, Siemens Mag Meters, M aster Meter Octave and other "Sensus Protocol" Meters

15. Warranty: 100% for minimum of 10 years

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Section 4.10 CONCRETE METER VAULTS

4.10.1 General

1. Concrete Meter Vaults provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. All vaults interior dimensions must allow a clear working space around the meters of at least 18-inches.

3. All vaults must be adequately reinforced to bear traffic and have an H-20 load rating per AASHTO HS-20-44.

4. All vaults shall be constructed with shiplap joints.

5. All vaults shall be watertight and sealed with butyl rubber gaskets as follows:

   (a) Seal bell and spigot joints of vault sections with butyl rubber flexible rope-like gasket material.

   (b) Butyl rubber flexible rope-like gasket material shall conform to ASTM C990.

   (c) Butyl rubber flexible rope-like gasket material shall be produced from blends of butyl rubber, refined hydro carbons, resins, and plasticized compounds reinforced with inert mineral filler and be solvent free.

   (d) Each gasket shall have a self-adhesive nature.

   (e) Each gasket shall be 1-inch diameter.

   (f) Each gasket shall be furnished in coils.

6. All vaults shall have two (2) removable tops with lift rings made with ¾-inch galvanized rebar and have a 3-inch loop. The lift rings shall be located at the four (4) corners of each top piece.

7. All vaults shall have manhole rungs installed under each manhole opening.

8. Manhole rungs shall be made of reinforced steel, copolymer polypropylene, and 14-inch wide. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung. Manhole rungs shall meet all OSHA requirements.

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9. All vaults shall have manhole rungs installed 12-inches apart, so that the top foothold is within 12-inches of the manhole cover, the bottom foothold is within 12-inches of the vault floor, and the footholds are 7-inches from the vault wall.

10. All vaults shall have an adequate floor sump beneath one of the manhole openings. The sump shall be 12 through 14-inches diameter by 3-inches deep.

11. The sump/drain shall not be connected to a sewer.

12. All vault floors shall be pitched to the drain.

13. Delivery shall be specified in terms of number of days from receipt of order.

14. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

15. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

16. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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4.10.2 Standard Concrete Meter Vault for Ductile Iron Water Service Pipe

1. Standard Concrete Meter Vaults for ductile iron water service pipes shall, as a minimum, meet all specifications as in Paragraphs 4.10.1 and the following:

2. Standard Concrete Meter Vaults for ductile iron water service pipes shall be provided in accordance with Standard **Meter Vault for Ductile Iron Water Service Pipe Detail (W-13.3)**, of these Material Specifications.

3. Concrete Meter Vaults for 8-inch service pipe shall be provided with inside dimensions of 10-feet long, 6-feet wide, and 6.5-feet tall.

4. Knockouts for the pipe shall be provided on each end shall be tapered with the center at least 2-feet above the floor and 2-feet from the same wall.

5. The knockout diameter shall be at least 12-inches.

6. Two (2) 30-inch manhole openings shall be provided and each shall be located on the same side of the top at each end across from the knockouts.

7. The walls, top, and bottom shall be 6-inches thick.

8. The Standard Concrete Meter Vaults shall be delivered in four (4) sections, as follows:

   (a) Bottom riser with monolithic floor; 3-feet-9-inches high.

   (b) Upper riser (without a top); 3-feet-3-inches high.

   (c) Two-piece top; 6-inches high.

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4.10.4 Oversize Concrete Meter Vault for Ductile Iron Water Service Pipe

1. Oversize Concrete Meter Vaults for ductile iron water service pipes shall, as a minimum, meet all specifications as in Paragraphs 4.9.1 and the following:

2. Oversize Concrete Meter Vaults for ductile iron water service pipes shall be provided in accordance with **Oversize Meter Vault for Ductile Iron Water Service Pipe Detail (W-13.3)**, of these Material Specifications.

3. Oversize Concrete Meter Vaults for ductile iron water service pipe shall be provided with inside dimensions of 11-feet, 2-inches long, 8-feet wide, and 6.5-feet tall.

4. Two (2) tapered knockouts for the pipes shall be provided on each end with the centers at least 2-feet above the floor and 2-feet from the outer walls of the pit.

5. The knockout diameter shall be at least 12-inches.

6. Two (2) 30-inch manhole openings shall be provided and each shall be located on the same side of the top at each end across from the knockouts.

7. The walls and bottom shall be 6-inches thick. The top shall be 8-inches thick.

8. The Oversize Concrete Meter Vaults shall be delivered in four (4) sections, as follows:

   (a) Bottom riser with monolithic floor; 3-feet-9-inches high.

   (b) Upper riser (without a top); 3-feet-3-inches high.

   (c) Two-piece top; 8-inches high.

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4.10.6 Concrete Meter Vaults Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Standard Concrete Meter Vault:

   (a) Arrow Concrete Products. – Standard 6-feet x 10-feet x 6.5-feet, or

   (b) Equal provided the products are manufactured as per these specifications.

2. Oversize Concrete Meter Vault:

   (a) Arrow Concrete Products. – Oversize 8-feet x 11.17-feet x 6.5-feet, or

   (b) Equal provided the products are manufactured as per these specifications.

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Section 4.11 MANHOLE FRAMES AND COVERS FOR WATER VAULTS

4.11.1 General

1. Manhole frame and covers provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. The manhole frame and cover shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 Class 35B strength of materials requirements.

3. Manhole frames and covers shall be strong, durable, even grained cast iron, ductile iron, or Fiber Reinforced Polymer smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

   (a) An HS20 load rating is required.

   (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.

   (c) Ductile iron shall conform to ASTM A 536 Grade 80-55-06.

   (d) Fiberglass Reinforced Polymer shall conform to ASTM C 1028.

   (e) Manhole covers and frame seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.

4. The Commission requires that the Manhole Frame and Covers be subjected to proof load testing as follows:

   (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.

   (b) The Manhole Frame and Covers shall show no detrimental deformation or cracks when a proof load of 40,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

   (c) Permanent deformation shall not exceed 1/8-inch.

   (d) All testing shall be at the supplier's expense.

5. Manhole covers shall have a diamond pattern cast on the top.

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6. Manhole Frame and Cover shall be provided with individual permanent markings that are easily discernable and show the following:

   (a) Name of the producing foundry and country of manufacture preceded by the words "Made in", such as "Made in USA"

   (b) AASHTO designation or ASTM designation number

   (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,

   (d) Heat identification and cast date (MM/DD/YY),

   (e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,

   (c) Manufactured shall mean raw material formed into a finished product,

   (d) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.

8. Delivery shall be specified in terms of number of days from receipt of order.

9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

10. The manufacturer/vendor/shipper must use care in preparing products for shipment and in handling during shipment and delivery, to insure that the water meters are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged manhole frame and covers will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the manhole frame and cover and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AASHTO and ASTM Standards.

4.11.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All finished product(s) shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the finished product(s) showing overall dimensions,

   (b) Material specifications for each component of the finished product(s),

   (c) Coating applied to each component of the finished product(s), if applicable,

   (d) Weight of each component and total weight for each finished product(s), and

   (e) Country of origin for each component.

3. If applicable, the manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying type of coating, color of coating, manufacturer of coating, part number of the coating, and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the finished product(s) meets all the requirements of the AIS, an explanation, in the letter, of how the finished product(s) meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all finished product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the finished product(s) that states that the finished product(s) shall be free from all defects in material, coatings, and workmanship under normal use of the product from time of delivery for a minimum ten (10) year time period.

8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the AASHTO M105 35B, ASTM A48 35B, and NIST. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product(s), in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the finished product(s) as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the finished product(s) as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct finished product(s) to be used.

4.11.3 Standard Manhole Frame 32-inch by 8-inch

1. Standard Manhole Frame 32-inch by 8-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 32-inch by 8-inch shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:

3. Standard Manhole Frame 32-inch by 8-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Standard Manhole Frame 32-inch by 8-inch shall have a minimum dimensions shall be in accordance with **32" X 8" Water Frame Only Detail (W-13.6).**

5. Standard Manhole Frame 32-inch by 8-inch shall have a minimum 30-inch diameter access opening.

6. Standard Manhole Frame 32-inch by 8-inch shall have a maximum height of 8-inches.

4.11.4 32-inch Standard Water Manhole Cover

1. 32-inch Standard Water Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. 32-inch Standard Water Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:

3. 32-inch Standard Water Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 32-inch Standard Water Manhole Cover shall have a minimum dimensions shall be in accordance with **32" Standard Water Manhole Cover Detail (W-13.7).**

5. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.

6. The word "WATER" shall be raised relief.

7. 32-inch Standard Water Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 31-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-3/4-inch thick (plus or minus 1/16-inch).

8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

4.11.5 24-inch Replacement Water Manhole Cover

1. 24-inch Replacement Water Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. 24-inch Replacement Water Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:

3. 24-inch Replacement Water Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 24-inch Replacement Water Manhole Cover shall have a minimum dimensions shall be in accordance with **24" Replacement Water Cover Detail (W-13.8).**

5. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.

6. The word "WATER" shall be raised relief.

7. 24-inch Replacement Water Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).

8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

4.11.6 Replacement 26-inch Water Manhole Cover

1. 26-inch Replacement Water Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. 26-inch Replacement Water Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:

3. 26-inch Replacement Water Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 26-inch Replacement Water Manhole Cover shall have a minimum dimensions shall be in accordance with **26" Replacement Water Cover Detail (W-13.9).**

5. The word "WATER" shall be raised relief.

6. 26-inch Replacement Water Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2inch long, a 26-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/8-inch thick (plus or minus 1/16-inch).

7. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

4.11.7 Composite Locking 24-inch or 32-inch Water Cover

1. Composite Locking Manhole Covers provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Composite Locking Manhole Covers shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following exceptions and additions:

3. Composite Locking Manhole Covers provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

4. Composite Locking Manhole Covers shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 and have a HS20 load rating.

5. Composite Locking Manhole Covers shall be strong, durable, even from fiber reinforced polymer (FRP). It shall consist of a FRP matrix consisting of between 45% to 70% fiber reinforcement by weight. Fiber reinforcement shall consist of fiberglass, carbon, aramid, basalt and/or natural fibers. The polymer matrix shall be thermoset consisting of a polyester, vinylester, epoxy, polyurethane, and/or hybrid chemical composition. The resin matrix must be thermoset. Composite Locking 24-inch Manhole Covers shall be smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

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6. Composite Locking Manhole Covers shall be of uniform quality, with a dimensional tolerance of 1/16 of an inch. The finished product will feature a strength to weight ratio of 750:1. There shall be no possibility of corrosion welding between the cover and the frame, preventing damage to the infrastructure when opening. Gasket system shall be integrated to reduce traffic shock and abatement of noise and malodors. Static Coefficient of Friction shall be 0.6 or greater, as described in ASTM C1028 Standard, in both wet and dry applications.

7. Composite Locking Manhole Covers shall be shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.

8. The Commission requires that the Composite Locking 24-inch Manhole Covers shall be subjected to proof load testing as follows:

   (d) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.

   (e) Composite Locking Manhole Covers shall be shall show no detrimental deformation or cracks when a proof load of 50,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

   (f) Permanent deformation shall not exceed 1/8-inch.

   (g) All testing shall be at the supplier's expense.

9. Composite Locking 24-inch Manhole Covers shall have a non-slip pattern cast on the top.

10. Composite Locking Manhole Covers shall be provided with individual permanent markings that are easily discernable and show the following:

    (h) Name of the producing manufacturer and country of manufacture preceded by the words "Made in", such as "Made in USA"

    (i) AASHTO designation or ASTM designation number

    (j) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,

    (k) Manufacturing date (MM/DD/YY),

11. The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

12. The word “WATER” shall be raised relief.

13. Composite Locking 24-inch Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

14. Composite Locking 24-inch Manhole Cover dimensions shall be in accordance with **24” Composite Locking Water Cover Detail (W-13.10).**

15. The Composite Locking 24-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two ¼-turn penta head laches on each side of the cover, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).

16. Composite Locking 32-inch Manhole Cover shall fit any of the Standard 32-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

17. Composite Locking 32-inch Manhole Cover dimensions shall be in accordance with 32**” Composite Locking Water Cover Detail (W-13.11)**

18. The Composite Locking 32-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two ¼-turn penta head laches on each side of the cover, a 1-1/2-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).

19. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

4.11.8 Coatings

No coatings are required for manhole frame and covers or covers.

4.11.9 Water Manhole Frame and Covers Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the

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component(s) shall result in the product no longer being approved and removed from this list.

1. East Jordan Iron Works

   (a) Standard MHF 32-inch by 8-inch, Part #: 2008 11

   (b) Standard MHC 32-inch, Part #: 2006 81

   (c) Replacement MHC 24-inch, Part #: 1246 75

   (d) Replacement MHC 26-inch, Part #: 2110 24

   (e) Composite Locking MHC 24-inch, Part #: COM 2401 __

   (f) Composite Locking MHC 32-inch, Part #: COM 2401 __

2. Approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.

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Section 4.12 PLASTIC PIT METER SETTER FOR COLD CLIMATES

1. Plastic Pit Meter Setters provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Plastic Pit Meter Setters shall be constructed of 20-inch or 36-inch diameter high quality, high-density polyethylene pipe. Unless otherwise approved by the Commission, pit dimensions for the following meter sizes shall be:

   (a) 5/8-inch meter; shall be 20-inch diameter by 48-inches deep.

   (b) 5/8-inch by 3/4-inch meter; shall be 20-inch diameter by 48-inches deep.

   (c) 3/4-inch meter; shall be 20-inch diameter by 48-inches deep.

   (d) 3/4-inch by 1-inch meter; shall be 20-inch diameter by 48-inches deep.

   (e) 1-1/2-inch meter; shall be 36-inch diameter by 48-inches deep.

   (f) 2-inch meter; shall be 36-inch diameter by 48-inches deep.

3. Plastic Pit Meter Setters inlet valve shall be a lead free meter angle valve.

   (a) 5/8-inch to 1-inch meters require a quick connection on the outlet side of the meter valve.

   (b) 1-1/4-inch to 2-inch require a flange connection on the outlet side of the meter valve.

4. Plastic Pit Meter Setters outlet valve shall be a lead free angle cartridge dual check valve.

   (a) 5/8-inch to 1-inch meters require a quick connection on the inlet side of the check valve.

   (b) 1-1/4-inch to 2-inch require a flange connection on the inlet side of the check valve.

5. Plastic Pit Meter Setters shall include copper tube, K type risers.

6. Plastic Pit Meter Setters shall include a male iron pipe connection on both the inlet and outlet connection of the risers.

7. Delivery shall be specified in terms of number of days from receipt of order.

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8. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

10. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 4.13 FRAME AND LIDS FOR PLASTIC METER PIT SETTER

1. Frame

   (a) Frames shall be made of cast iron or ductile iron and have a 25,000 PSI tensile strength.

   (b) Frames for plastic meter setters for 5/8-inch through 1-inch shall have tile size of 20-inches and a lid size of 12-inches.

   (c) Frames for plastic meter setters for 1-1/2-inch through 2-inch shall have tile diameter of 36-inches and a lid diameter of approximately 12-1/2-inches.

   (d) Frames shall be provided with double lids.

   (e) Frames shall provide a recessed lip to allow the top lid to remain flush with the top of the frame.

2. Lids

   (a) Inner lids shall be plastic.

   (b) Inner lids shall be approximately11-1/2-inches in diameter.

   (c) Top lids shall be plastic.

   (d) Top lids shall be approximately12-1/2-inches in diameter.

   (e) Top lids shall be provided with a worm type locking device.

   (f) Top lids shall be provided with a standard 27/32-inch brass pentagon nut.

   (g) Top lids shall be provided with a 2-inch hole and plug for an automatic meter reading device.

   (h) Top lids shall have “WATER METER” printed clearly on them. The printings shall be permanently made on to the lids.

3. Delivery shall be specified in terms of number of days from receipt of order.

4. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

5. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and

all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

6. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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CHAPTER 5 CROSS CONNECTION DEVICES,

Section 5.1 BACKFLOW PREVENTERS

5.1.1 General

1. Cross Connection Devices provided to the Springfield Water and Sewer Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with the Commission's Specifications.

2. The Cross Connection Devices shall conform to AWWA C-110 (most current revision) Standard for Double Check Valve Backflow Prevention Assembly and/or AWWA C-511 (most current revision) Standard for Reduced Pressure Principle Backflow Preventer.

   (a) Devices are the back flow preventer only.

   (b) Assemblies are from the manufacturer and include two shut off valves and the back flow preventer.

3. Devices may have either bronze, stainless steel, cast iron or ductile iron bodies.

   - Ductile and Cast Iron bodies shall be epoxy coated

4. All devices and assemblies shall be lead free.

5. All shut off valves shall be slow closing, have tamper switches, and open close indicators in accordance with National Fire Protection Association (NFPA) 13.

6. All devices and assemblies shall be rated for a minimum of 175-PSI.

7. Devices installed on hot water lines with elevated temperatures shall be approved for hot water use.

8. Cross Connection Devices shall be delivered with proof of testing by the University of California (USC) and/or the American Society of Sanitary Engineering (ASSE), as set forth in Massachusetts Drinking Water Regulations 310 CMR 22.22.

9. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), or meet the requirements of the Buy American Act (BAA),as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,

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(c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

(d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the BAA language, and all guidance issued by the Government Accountability Office (GAO), or

(f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

10. Delivery shall be specified in terms of number of days from receipt of order.

11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

13. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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5.1.2 Fire Systems

1. Fire Systems without Chemicals Added

   (a) At a minimum, based on the degree of health hazard, a double check valve devise or assembly is required on all new systems and shall be provided in accordance with Section 5.1.1and with the following:

   - Devices and assemblies 2-inches and larger require a double check valve detector assembly (DCDA).
   - Devices and assemblies less than 2-inches do not require a detector meter.

   (b) The DCDA or device shall be provided with a water meter that reads in cubic feet and a double check in the bypass line.

   (c) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.

   - The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
   - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.

   (d) 3-inch and larger assemblies may be provided with Ductile Iron Outside Spindle and Yoke (OS&Y) Gate Valves in accordance with Section 3.6.4 of these Specifications or ductile iron butterfly valves.

   - The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
   - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.

2. Fire Systems with Chemicals Added

   (a) A reduced pressure zone (RPZ) backflow preventer devise or assembly is required on all new systems with chemicals added and shall be provided in accordance with Section 5.1.1 and with the following:

   - Devices and assemblies 2-inches and larger require a RPZ detector assembly (RPDA).
   - Devices and assemblies less than 2-inches do not require a detector meter.

   (b) The RPDA or device shall be provided with a water meter that reads in cubic feet and a RPZ in the bypass line.

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(c) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.

- The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
- Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.

(d) 3-inch and larger assemblies may be provided with Ductile Iron Outside Spindle and Yoke (OS&Y) Gate Valves in accordance with Section 3.6.4 of these Specifications or butterfly valves.

- The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
- Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with ball type test cocks or plugs.

(e) The RPZ backflow preventer shall be provided with two independent check valves with an intermediate relief valve.

(f) The RPZ backflow preventer shall be provided with a drain sized to the manufacturer's discharge rate list.

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5.1.3 Irrigation Systems

1. At a minimum, a testable pressure vacuum breaker devise or assembly is required on all new systems and shall be provided in accordance with Section 5.1.1 and with the following:

   (a) Pressure Vacuum breakers may be rated for 150-PSI or greater.

   (b) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.

   - The valves shall have FIP threads.
   - Threaded outlets on the shut off valves for testing the back flow assemblies shall be provided with ball type test cocks.

   (c) The pressure vacuum breaker shall be provided with a bronze body with MIP threads.

   (d) The pressure vacuum breaker shall be provided with a stainless steel spring loaded single float and disc with an independent first check.

   (e) The pressure vacuum breaker shall be provided with shut-off valves and ball type test cocks. The shut-off handles may be brass or stainless steel.

2. A double check valve assembly is also acceptable and shall be provided in accordance with Section 5.1.2 above. If the service is metered no detector meter is required.

3. A reduced pressure zone (RPZ) backflow preventer is also acceptable and shall be provided in accordance with Section 5.1.2above. If the service is metered no detector meter is required.

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5.1.4 Metered Process, Commercial, or Industrial Systems

1. At a minimum, reduced pressure zone (RPZ) backflow preventer devise or assembly is required on all new systems and shall be provided in accordance with the General Section above and with the following:

   (a) Detector meters are not required on metered connections.

   (b) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.

   - The valves and device shall have all threaded connections.
   - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.

   (c) 3-inch and larger assemblies shall be provided with Ductile Iron Outside Spindle and Yoke (OS&Y) Gate Valves in accordance with Section 3.6.4 of these Material Specifications.

   - The valves and device shall have all flange connections.
   - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with ball type test cocks or plugs.

   (d) The RPZ backflow preventer shall be provided with two independent check valves with an intermediate relief valve.

   (e) The RPZ backflow preventer shall be provided with a drain.

5.1.5 Threaded Connections

1. All threaded connections shall be provided with a hose connection vacuum breaker.

   (a) The hose connection vacuum breaker shall be provided with a single check valve with an atmospheric vacuum breaker vent.

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5.1.6 Backflow Preventers Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

Assembly Description	Watts	Ames	FEBCO
Assemblies without Detector			
Up to 2" Double Check Assembly (Bronze Body)	007	2000B	850
Up to 2" Double Check Assembly	719	200B	
Up to 2" Reduced Pressure Zone Assembly	009	4000B	825Y
Up to 2" Reduced Pressure Zone Assembly	919	400B	860
1" or 2" Testable Vacuum Breaker	800M4QT	A200	765
Double Check Assemblies with Detector			
2" Double Check Detector Assembly (Bronze Body)	007DCDA	3000B	
2-1/2" - 3" Double Check Detector Assembly (Iron Body)	007DCDA		858
3" - 10" Double Check Detector Assembly (Iron Body)	709DCDA		806YD & 856
2-1/2" - 8" Double Check Detector Assembly w/ B-fly	757 BF	M300 BF Maxim & C300 BF Colt	
2-1/2" - 8" Double Check Detector Assembly w/ B-fly	757N BF	M300N BF Maxim & C300N BF Colt	
2-1/2" - 10" Double Check Detector Assembly	757	M300 Maxim & C300 Colt	
2-1/2" - 10" Double Check Detector Assembly	757N	M300N Maxim & C300N Colt	
2-1/2" - 12" Double Check Detector Assembly	774DCDA	3000SS Silver Bullet	
Reduced Pressure Zone Assemblies with Detector			
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	909RPDA	4000CIV	826YD
2-1/2" - 6" Reduced Pressure Zone Detect. Ass. w/ B-fly	957RPDA BF	M400 BF Maxim & C400 BF Colt	
2-1/2" - 6" Reduced Pressure Zone Detect. Ass. w/ B-fly	957NRPDA BF	M400N BF Maxim & C400N BF Colt	
2-1/2" - 6" Reduced Pressure Zone Detect. Ass. w/ B-fly	957ZRPDA BF	M400Z BF Maxim & C400Z BF Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	957RPDA	M400 Maxim & C400 Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	957NRPDA	M400N Maxim & C400N Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	957ZRPDA	M400Z Maxim & C400Z Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	994RPDA	4000SS	

2. Or the approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.

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5.1.7 Enclosures – Permanent

1. Enclosures shall meet all American Society of Sanitary Engineers (A.S.S.E.) 1060 requirements.

2. Enclosures shall be kept in dry shipping containers until installation.

3. Acceptable materials for enclosures shall be aluminum or fiberglass for small enclosures.

4. Insulation thickness for enclosures shall be sufficient to withstand freezing.

5. Adhesive applied stock or material secured by mechanical fasteners may be cause for rejection.

6. Structural members for enclosures shall be aluminum, or fiberglass. Wood or particleboard shall not be allowed.

7. The roof, walls, and access panels for enclosures shall be constructed of specified materials in specified thickness.

8. Heaters shall be provided with heaters and sized to prevent freezing of backflow preventers, meters, valves, and/or piping.

9. Enclosures shall allow the device(s) to be installed at least three (3) to four (4) feet above the floor, eighteen (18) inches from any wall, ceiling, or other device and with clear access to the BFP and/or meter if installed in same enclosure.

10. Delivery shall be specified in terms of number of days from receipt of order.

11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

13. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

5.1.8 Enclosures – Seasonal

1. Enclosures shall be kept in dry shipping containers until installation.

2. Acceptable materials for enclosures including structural members for enclosures may be epoxy coated steel, aluminum, polyethylene, or fiberglass. Wood or particleboard shall not be allowed.

3. Insulation is not required as these are seasonal water services.

4. The enclosures shall be forest green.

5. The enclosures may be attached to the pad with minimum1-inch angle iron frame and at least four (4) 3/8-inch by 5-inch L anchors or two lockable steel latches on each end of the enclosure flange.

6. A drain with animal proof screen shall be provided.

7. The enclosures shall be a minimum size of 48-inches long, 24-inches wide, and 32-inches high, a maximum of 54-inches long, 44-inches wide, and 38-inches high, or as otherwise approved by SWSC during the submittal process. Please note the enclosures submitted must fit on the pads and must enclose the complete meter and backflow preventer assembly described herein.

8. Enclosure shall be lockable and may be hinged.

9. The roof, walls, and access panels for enclosures shall be constructed of specified materials in specified thickness.

10. Delivery shall be specified in terms of number of days from receipt of order.

11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

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13. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(a) Name of Municipality/Utility

(b) Total amount of product bid on and amount delivered

(c) Date the bid was accepted and date the product was delivered

(d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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CHAPTER 6 TEMPORARY BYPASS PIPE AND APPURTENANCES

Section 6.1 TEMPORARY WATER MAINS, VALVES, FITTINGS, AND SERVICES

6.1.1 General

1. Temporary water mains, valves, fittings, water service hose, and hose fittings provided to the Commission or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Temporary water mains, valves, water service hose, and hose fittings shall be suitable for potable water, and certified to NSF 61 standards.

3. Temporary water mains, fittings, and valves shall be galvanized steel, polyvinylchloride (PVC) plastic, or polyethylene (PE) of the highest quality, and suitable for all conditions of use, unless otherwise approved by the Engineer or SWSC.

4. PVC used to make temporary PVC water mains, couplings, and fittings shall meet or exceed the minimum requirements of ASTM D 1784, and the following:

   (a) PVC shall be 1120 defined as type 1, grade1, class 12454-B

   (b) Tensile strength: 7,000-PSI minimum

   (c) Modulus of Elasticity: 400,000-PSI minimum

   (d) Impact Strength (Izod): 0.65-ft-lbs per 1-inch of notch

   (e) Deflection Temperature: 158-degrees F minimum

   (f) Flammability: self-extinguishing

5. Temporary water service hose, and hose fittings shall be rated for 200 PSI.

6. All joints shall be non-permanent restrained either groove and spine or Victaulic, unless otherwise approved by the E&TS. Glued joints are not allowed unless approved by the E&TS. All joints shall be water tight.

7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

(b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

(c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

(d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

8. The manufacturer/vendor/shipper must use care in preparing temporary water mains, valves, hydrants, water service hose, and hose fittings for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged product(s) will not be accepted.

9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

6.1.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the product(s) showing overall dimensions,

   (b) Material specifications for each component,

   (c) Coating applied to each component, if applicable,

   (d) Weight of each component and total weight, and

   (e) Country of origin for each component.

3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation,

primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product(s) meet all the requirements of the AIS, an explanation, in the letter, of how the product(s) meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

6. The manufacturer shall furnish a certified statement that all product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole product(s) for a minimum one (1) year time period from time of delivery.

8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements, American Society of Testing and Materials (ASTM) A48, Class 35B, and as the Commission may require the National Institute of Standards Technology (NIST) standards – Proof Load Testing.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

(a) Approved means the contractor can supply the material as shown on the drawing(s).

(b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.

(c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

6.1.3 Temporary PVC Water Mains

1. Temporary PVC water mains shall be a restrained joint type/spline connected, high impact polyvinyl chloride (PVC) with grooved ends to be connected with specially designed couplings, splines, and O-ring seals. Couplings, splines, and O-ring seals shall be supplied with the pipe.

2. Temporary PVC water mains shall be designed to meet or exceed the minimum requirements of ASTM D 2241.

3. Temporary PVC water mains shall be a minimum Standard Dimension Ratio (SDR) 17 and rated for 250 PSI.

4. Temporary PVC water mains shall be provided in 20-foot length, minimum.

5. Temporary PVC water mains shall be provided with the following dimensions::

Nominal Diameter in inches	Actual Outside Diameter in inches	Minimum Wall Thickness in inches	Weight in lbs/foot
2-inch	2.375	0.140	0.69
4-inch	4.5	0.265	2.5
6-inch	6.625	0.390	5.18

6.1.4 Temporary PVC Couplings

1. Temporary PVC water mains shall be provided with PVC couplings that are designed to meet or exceed the minimum requirements of ASTM D 3139, and the following:

(a) PVC couplings shall provide joint restraint by means of a nylon spline inserted into a space created when a groove on the pipe and a groove in the coupling are aligned.

(b) PVC couplings shall be a minimum Standard Dimension Ratio (SDR) 17 and rated for 250 PSI.

(c) PVC couplings shall contain a non-permanent pre-lubricated O-ring seal on each end.

(d) PVC couplings shall be NSF-61 listed.

2. O-ring seals shall meet or exceed ASTM F-477 and made from either Nitrile Butadiene Rubber (NBR) or Polyisoprene Rubber (IR).

3. Splines shall be nylon, round, and for 2-inch temporary pipe, couplings, fittings, and valves the diameter of the spline shall be 0.188-inches. For 4-inch and 6-inch temporary pipe, couplings, fittings, and valves the diameter of the nylon splines shall be 0.25-inches.

6.1.5 Temporary Couplings for Plain End PVC Mains

1. Temporary couplings for used to join plain end PVC water mains shall be a bolted mechanical assembly rated for a minimum of 250-PSI.

2. The body of the coupling shall be ductile iron in accordance with ASTM A-536, grade 65-45-12.

3. The body shall have integral gripping teeth that provide connection to the pipe.

4. The body shall be painted with enamel paint.

5. The rubber gasket shall be pre lubricated and be a grade T nitrile compound conforming to ASTM D-2000, designation 5BG615A14B24.

6. Bolts and nuts shall be provided with flat washers. The hardware shall be Zinc plated carbon steel. Minimum tensile strength of bolts shall 110,000- PSI.

6.1.6 Temporary PVC Fittings

1. Temporary PVC fittings shall be designed to meet or exceed the minimum requirements of ASTM D 3139, and the following:

2. PVC fittings shall be provided with spline grooved ends for use with temporary PVC water mains and PVC couplings.

3. PVC fittings shall be a minimum Standard Dimension Ratio (SDR) 17 and rated for 250 PSI.

4. PVC fittings shall be NSF-61 listed.

5. Other ends may be allowed and must be approved by E&TS before purchase.

6.1.7 Temporary Valves

1. Temporary valves for PVC water mains shall be butterfly valves rated for 250-PSI.

2. The body of the valve shall be PVC 1120 defined as type 1, grade1, class 12454-B meet or exceed the minimum requirements of ASTM D 1784.

3. The vane/disc shall be enclosed in a ductile iron housing in accordance with ASTM A-536, grade 65-45-12.

4. The vane/disc shall be ductile iron in accordance with ASTM A-536, grade 65-45-12.

5. The vane/disc shall be rubber encapsulated with grade T nitrile compound conforming to ASTM D-2000, designation 5BG615A14B24.

6. The valves shall have removable handles.

6.1.8 Temporary Water mains, Couplings, Fittings, and Valves, and Model Numbers Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Aquamine, LLC (A Victaulic Company)

   (a) 2-inch water main: 290021725

   (b) 4-inch water main: 290041725

   (c) 6-inch water main: 290061725

   (d) 2-inch coupling: 290400002

   (e) 4-inch coupling: 290400004

   (f) 6-inch coupling: 290400006

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(g) 2-inch butterfly valve: 295000002

(h) 4-inch butterfly valve: 295000004

(i) 6-inch butterfly valve: 295000006

(j) 2-inch X 2-inch X 2-inch tee: 291700002

(k) 4-inch X 4-inch X 4-inch tee: 291700004

(l) 6-inch X 6-inch X 6-inch tee: 291700006

(m) 4-inch X 4-inch X 2-inch reducing tee: 291800442

(n) 6-inch X 6-inch X 2-inch reducing tee: 291800662

(o) 6-inch X 6-inch X 4-inch reducing tee: 291800664

(p) 4-inch X 2-inch reducer: 291900042

(q) 6-inch X 2-inch reducer: 291900062

(r) 6-inch X 4-inch reducer: 291900064

(s) 2-inch end caps: 291500002

(t) 4-inch end caps: 291500004

(u) 6-inch end caps: 291500006

(v) 2-inch 90-degree bend: 291000002

(w) 4-inch 90-degree bend: 291000004

(x) 6-inch 90-degree bend: 291000006

(y) 2-inch 450-degree bend: 291200002

(z) 4-inch 45-degree bend: 291200004

(aa) 6-inch 45-degree bend: 291200006

2. Certa-lok, Yelomine Pipe

(a) 2-inch water main: 216213

(b) 4-inch water main: 218217

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(c) 6-inch water main: 219214

(d) 2-inch coupling: 715020

(e) 4-inch coupling: 715044

(f) 6-inch coupling: 715068

(g) 2-inch butterfly valve: NOT AVAILABLE (NA)

(h) 4-inch butterfly valve: NA

(i) 6-inch butterfly valve: NA

(j) 2-inch X 2-inch X 2-inch tee: _____

(k) 4-inch X 4-inch X 4-inch tee: _____

(l) 6-inch X 6-inch X 6-inch tee: _____

(m) 4-inch X 4-inch X 2-inch reducing tee: _____

(n) 6-inch X 6-inch X 2-inch reducing tee: _____

(o) 6-inch X 6-inch X 4-inch reducing tee: _____

(p) 4-inch X 2-inch reducer: _____

(q) 6-inch X 2-inch reducer: _____

(r) 6-inch X 4-inch reducer: _____

(s) 2-inch end caps: _____

(t) 4-inch end caps: _____

(u) 6-inch end caps: _____

(v) 2-inch 90-degree bend: _____

(w) 4-inch 90-degree bend: _____

(x) 6-inch 90-degree bend: _____

(y) 2-inch 450-degree bend: _____

(z) 4-inch 45-degree bend: _____

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(aa) 6-inch 45-degree bend: _____

3. Equal provided the products are manufactured as per these specifications.

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CHAPTER 7 SEWER MAINS AND APPURTENANCES

Section 7.1 SEWER PIPE

7.1.1 Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. All pipe furnished shall be either in 13-foot, 18-foot or 20-foot lengths. Straight pipe shall be furnished in lengths according to ASTM D3034.

3. All pipe and fittings furnished shall be clearly marked on the outside indicating name, manufacturer, nominal diameter, ASTM, schedule, and/or pipe or pressure class designation.

4. PVC pipe provided for depths between 4-feet and 15-feet shall be:

   (a) sizes 4-inch to 15-inch shall conform with ASTM D3034 for solid wall PVC. The PVC pipe shall have an SDR ratio of 35 and a pipe stiffness of 46 psi.

   (b) 18-inch and above shall conform with ASTM F679 for large diameter pipes. The PVC pipe shall have an SDR ratio of 35 and a pipe stiffness of 46 psi.

5. PVC pipe provided for depths between 16-feet and 30-feet shall be:

   (a) sizes 4-inch to 15-inch shall conform with ASTM D3034 for solid wall PVC. The PVC pipe shall have an SDR ratio of 26 and a pipe stiffness of 115 psi.

   (b) 18-inch and above shall conform with ASTM F679 for large diameter pipes. The PVC pipe shall have an SDR ratio of 26 and a pipe stiffness of 115 psi.

6. The pipe manufacturer shall be required to meet all the requirements for PVC Solid Wall Pipe as stated in ASTM D3034 or ASTM F679 whichever is applicable. Specifically, the manufacturer shall perform stiffness, deflection, acid resistances and joint and fitting tightness tests on PVC sanitary sewer pipe and will be required to show certification for such test(s) and at the option of Commission. The pipe manufacturer will be required to perform such test(s) in the presence of the Commission's representative.

7. PVC pipe shall have bell and spigot push-on joints. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.

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8. Sewer lines shall be green in color or as approved by the Commission.

9. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

10. Delivery shall be specified in terms of number of days from receipt of order.

11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

13. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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7.1.2 Polyvinyl Chloride (PVC) Sewer Fittings

1. Polyvinyl Chloride (PVC) fittings provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. In addition to Section 7.1.1 of these Material Specifications, PVC fittings shall be provided as follows:

3. PVC wyes shall be furnished in lengths of not more than 3-ft. Saddle wyes are not allowed.

4. PVC fittings and accessories for sewers shall have bell and/or spigot configurations compatible with the pipe. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.

5. Delivery shall be specified in terms of number of days from receipt of order.

6. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

8. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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7.1.3 Sewer Service Connections

1. Sewer Service Connections, when not connected to a sewer manhole or wye, may be provided to the Commission or Installer, and shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. In addition to Section 7.1.1 of these Material Specifications, Sewer Service Connections shall be provided as follows:

3. Sewer Service Connections shall consist of a PVC hub, rubber sleeve and stainless steel band.

4. Sewer Service Connection shall be a compression fit into the cored wall of a mainline pipe. Hub shall be made from heavy-duty PVC material.

5. Sewer Service Connection shall be provided with a stainless steel clamping assembly and shall be made from minimum 301 grade stainless steel.

6. Sewer Service Connections gaskets shall be installed by the manufacturer. The manufacturer shall use a water-based solution during assembly. Pipe lube is not allowed.

7. The Sewer Service Connection's rubber sleeve and gasket, when applicable, shall meet the requirements of ASTM F477, ASTM D3139 or ASTM D3212.

8. Sewer Service Connections shall be manufactured by Inserta Tee or acceptable equivalent product.

9. Delivery shall be specified in terms of number of days from receipt of order.

10. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

12. References

    The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (e) Name of Municipality/Utility

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(f) Total amount of product bid on and amount delivered

(g) Date the bid was accepted and date the product was delivered

(h) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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7.1.4 Ductile Iron Push-on Joint for Sewer Pipe

1. Ductile Iron (DI) Pipe provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. In addition to Section 3.1.1 of these Material Specifications, DI Pipe shall be provided as follows:

3. Ductile iron pipe shall conform to AWWA C151 standards and shall be supplied in industry 18-foot and 20-foot lengths.

4. Delivery shall be specified in terms of number of days from receipt of order.

5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

7. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product.

7.1.5 Ductile Iron Fittings for Sewer Pipe

1. Ductile Iron (DI) fittings provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. In addition to Section 3.12.1 of these Material Specifications, DI fittings shall be provided as follows:

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3. Pipe fittings shall be ductile iron with pressure rating of 350 PSI for 24-in and smaller piping and 250 PSI for 30-in and larger piping.

4. Fittings shall meet the requirements of AWWA C110 or AWWA C153 as applicable.

5. PVC fittings and accessories for sewers shall have bell and/or spigot configurations compatible with the pipe. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.

6. Delivery shall be specified in terms of number of days from receipt of order.

7. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

8. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

9. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 4.1 SANITARY SEWER MANHOLES

4.1.1 General

1. Pre-cast Concrete Manholes provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Materials' quality, manufacturing process and finished sections are subject to inspection and approval by the Commission at either place of manufacture or at work site.

3. Materials will be examined for compliance with ASTM standards, these Materials Specifications, and approved manufacturer's drawings. The Commission will also take note regarding appearance, dimensions, blisters, cracks and other anomalies, if any.

4. The Commission reserves the right to reject any manhole or structure that fails to meet any requirements specified herein. Rejection may occur at place of manufacture, at work site, or following installation and will not cause the Commission to incur any additional costs.

5. Minor repairs to pre-cast concrete sections, if required, are not accepted unless authorized by the Commission.

6. Materials and equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts and manufacturer's service.

7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

8. Delivery shall be specified in terms of number of days from receipt of order.

9. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

11. References

12. The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    (a) Name of Municipality/Utility

    (b) Total amount of product bid on and amount delivered

    (c) Date the bid was accepted and date the product was delivered

    (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

4.1.4 Pre-cast Concrete Manholes

1. Pre-cast concrete shall be manufactured with concrete that meets the following requirements:

    (a) Minimum compressive strength shall be 5,000 PSI at 28 days.

    - Pre-cast concrete sections shall not be shipped until after concrete has attained a minimum 5,000 PSI compressive strength.

    (b) Maximum water-to-cement ratio shall be 0.40 by weight.

    (c) Minimum cement content shall be 600 lbs of cement per cubic yard of concrete.

    (d) Shall conform to American Concrete Institute (ACI) 318 and ACI 350R.

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(e) When "fy" exceeds 40,000 psi, "z" (ACI 318) shall not exceed 95 kips/in, "fs" shall be completed and shall not exceed 50 percent of "fy".

(f) Products shall be designed to support their own weight, weight of soil at 130-PCF, and a live load equal to AASHTO HS-20 applied to top slab.

2. Lifting lugs or holes in each pre-cast section shall be provided for proper handling. Lifting lugs shall be provided for the top and bottom slab.

3. Pre-cast concrete manholes base sections, riser sections, transition top sections, flat slab tops and grade rings shall conform to ASTM C478.

4. Pre-cast concrete manholes bottom slab thickness, riser wall thickness, shall be as follows:

Diameter (feet)	Wall Thickness (inches)	Base Thickness (inches)	Max Pipe* (RCP) Diameter Allowed (inches)	Max Pipe* (DI/PVC) Diameter Allowed (inches)
4	5	6	18	24
5	6	8	30	36
6	7	8	36	48

* Pipe diameter may vary depending on number of penetrations.

5. Pre-cast concrete manholes top section shall be eccentric cone where cover over pipe exceeds 4-ft. Top section shall be a flat slab where cover over top of pipe is 4-ft or less.

6. Pre-cast concrete manholes base, riser and transition top sections shall have bell and spigot or joints tongue and groove joints.

7. Pre-cast concrete manhole base, riser, transition top, flat slab top and grade ring shall be designed for a minimum H-20 loading plus earth load. Earth load is 130 Pounds per Cubic Foot (PCF).

8. Pre-cast concrete manhole shall be marked on the inside of each pre-cast section with the date of manufacture, name and trademark of manufacturer.

9. Pre-cast concrete manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).

10. Base slab and walls shall be cast together to form a monolithic base section.

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11. Structure walls shall be designed for a lateral pressure based on an equivalent fluid unit weight of 90-Pounds per Cubic Foot (PCF). Pressure diagram shall originate at finished ground surface. Lateral pressure from vehicles shall be included in accordance with AASHTO.

12. Discontinuities in structures produced by openings and joints shall be considered in the design. Additional reinforcing around openings shall be provided. Frame openings shall carry full design loads to support walls.

13. Manhole shall be designed against flotation with ground water level at finished ground surface. Floatation prevention shall be achieved by dead weight of manhole and soil load above it. Skin friction, soil friction, or weight of equipment in manhole, if any, cannot be considered in the design against floatation.

14. Manhole shall be designed with a minimum number of joints. Maximum number of structure sections, including top slab, shall be four.

15. Pre-cast concrete manholes shall be constructed with a bell and spigot or tongue and groove joint.

16. Access openings, wall sleeves, and knockouts shall be provided at locations where indicated by the Commission or shown on Design Drawings and as follows:

    (a) Integrally cast knockout panels shall be sized for intended pipe sizes. Knockout panels shall have no steel reinforcing.

    (b) Pre-cast manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).

    (c) Horizontal wall joints shall be located 18-inches minimum from horizontal centerline of wall openings.

17. Manhole rungs shall be reinforced steel, copolymer polypropylene, 14-in wide, M.A. Industries Inc, PF Series or equal. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung. Manhole rungs shall meet all OSHA requirements.

18. Wall sleeves shall be provided by the pre-cast concrete manufacturer.

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Section 7.2 DAMP PROOF COATING

1. Damp proofing provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Damp proofing shall be of bituminous material and shall conform to ASTM D449

3. Damp proofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by W.R. Grace and Company; Meadows Trowel Mastic (Type 3), or equal products of another manufacturer.

4. Delivery shall be specified in terms of number of days from receipt of order.

5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

7. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 7.3 BRICK MASONRY

7.3.1 General

1. Bricks for masonry provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Bricks for masonry shall be sound, hard, uniformly burned, regular and uniform in shape and size. Under burned or salmon brick are not acceptable. Only whole brick shall be used.

3. Bricks for masonry shall be clay, shale, or similarly naturally occurring earthy substance and subjected to a heat treatment process at elevated temperatures.

4. Delivery shall be specified in terms of number of days from receipt of order.

5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

7. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

7.3.2 Bricks for Channels and Shelves

1. Bricks for channels and shelves shall conform to ASTM C32, Grade SS.

2. Bricks for channels and shelves tested so that the mean of five tests for absorption shall not exceed 8 percent and no individual brick exceed 11 percent.

7.3.3 Bricks for Frame and Cover Adjustment

Bricks intended for use in raising manhole frames to finished grade shall conform to ASTM C62.

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Section 7.4 MORTAR

1. Mortar provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. Mortar shall be composed of 1 part Portland cement, 2 parts sand, and hydrated lime not to exceed 10-lbs to each bag of cement.

3. Portland cement shall be ASTM C150, Type II; hydrated lime shall conform to ASTM C207.

4. Sand shall be washed, cleaned, screened, well graded with all particles passing a No. 4 sieve and conform to ASTM C33.

5. Delivery shall be specified in terms of number of days from receipt of order.

6. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

8. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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Section 7.5 MANHOLE FRAMES AND COVERS FOR SANITARY SEWERS

7.5.1 General

1. Manhole frame and covers provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. The manhole frame and cover shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 Class 35B strength of materials requirements.

3. Manhole frames and covers shall be strong, durable, even grained Cast iron, Ductile iron, or Fiber Reinforced Polymer smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

   (a) An HS20 load rating is required.

   (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.

   (c) Ductile iron shall conform to ASTM A 536 Grade 80-55-06.

   (d) Fiber Reinforced Polymer shall conform to ASTM C 1028

   (e) Manhole covers and frame seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.

4. The Commission requires that the Manhole Frame and Covers be subjected to proof load testing as follows:

   (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.

   (b) The Manhole Frame and Covers shall show no detrimental deformation or cracks when a proof load of 40,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

   (c) Permanent deformation shall not exceed 1/8-inch.

   (d) All testing shall be at the supplier's expense.

5. Manhole covers shall have a diamond pattern cast on the top.

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6. Manhole Frame and Cover shall be provided with individual permanent markings that are easily discernable and show the following:

   (a) Name of the producing foundry and country of manufacture preceded by the words "Made in", such as "Made in USA"

   (b) AASHTO designation or ASTM designation number

   (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,

   (d) Heat identification and cast date (MM/DD/YY),

   (e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

7. The product(s) shall have all parts cast or manufactured and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,

   (c) Manufactured shall mean raw material formed into a finished product,

   (d) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.

8. Delivery shall be specified in terms of number of days from receipt of order.

9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

10. The manufacturer/vendor/shipper must use care in preparing products for shipment and in handling during shipment and delivery, to insure that the water meters are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged manhole frame and covers will not be accepted.

11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the manhole frame and cover and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AASHTO and ASTM Standards.

7.5.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All finished product(s) shall be provided in accordance to these drawings. The drawings shall show the following:

   (a) Cross sectional drawings of the finished product(s) showing overall dimensions,

   (b) Material specifications for each component of the finished product(s),

   (c) Coating applied to each component of the finished product(s), if applicable,

   (d) Weight of each component and total weight for each finished product(s), and

   (e) Country of origin for each component.

3. If applicable, the manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying type of coating, color of coating, manufacturer of coating, part number of the coating, and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the finished product(s) meets all the requirements of the AIS, an explanation, in the letter, of how the finished product(s) meets the AIS requirements, and signed by the Owner or President of the Company.

5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

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6. The manufacturer shall furnish a certified statement that all finished product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

7. The manufacturer shall furnish a warranty for the finished product(s) that states that the finished product(s) shall be free from all defects in material, coatings, and workmanship under normal use of the product from time of delivery for a minimum ten (10) year time period.

8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the AASHTO M105 35B, ASTM A48 35B, and NIST. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product(s), in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.

    (a) Approved means the contractor can supply the finished product(s) as shown on the drawing(s).

    (b) Approved as Noted means the contractor can supply the finished product(s) as shown on the drawing(s), but with the changes as noted.

    (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct finished product(s) to be used.

7.5.3 Standard Manhole Frame 24-inch by 4-inch

1. Standard Manhole Frame 24-inch by 4-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 24-inch by 4-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Standard Manhole Frame 24-inch by 4-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Standard Manhole Frame 24-inch by 4-inch shall have a minimum dimensions shall be in accordance with **24" X 4" Sewer Frame Only Detail (S-02.51).**

5. Standard Manhole Frame 24-inch by 4-inch shall have a minimum 21-3/4-inch diameter access opening.

6. Standard Manhole Frame 24-inch by 4-inch shall have a maximum height of 4-inches.

7.5.4 Standard Manhole Frame 24-inch by 6-inch

1. Standard Manhole Frame 24-inch by 6-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 24-inch by 6-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Standard Manhole Frame 24-inch by 6-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Standard Manhole Frame 24-inch by 6-inch shall have a minimum dimensions shall be in accordance with **24" X 6" Sewer Frame Only Detail (S-02.52).**

5. Standard Manhole Frame 24-inch by 6-inch shall have a minimum 21-3/4-inch diameter access opening.

6. Standard Manhole Frame 24-inch by 6-inch shall have a maximum height of 6-inches.

7.5.5 Standard Manhole Frame 24-inch by 8-inch

1. Standard Manhole Frame 24-inch by 8-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 24-inch by 8-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Standard Manhole Frame 24-inch by 8-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Standard Manhole Frame 24-inch by 8-inch shall have a minimum dimensions shall be in accordance with **24" X 8" Sewer Frame Only Detail (S-02.53).**

5. Standard Manhole Frame 24-inch by 8-inch shall have a minimum 21-3/4-inch diameter access opening.

6. Standard Manhole Frame 24-inch by 8-inch shall have a maximum height of 8-inches.

7.5.6 Replacement Manhole Frame 26-inch by 6-inch

1. Replacement Manhole Frame 26-inch by 6-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Replacement Manhole Frame 26-inch by 6-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Replacement Manhole Frame 26-inch by 6-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Replacement Manhole Frame 26-inch by 6-inch shall have a minimum dimensions shall be in accordance with **26" X 6" Sewer Frame Only Detail (S-02.54).**

5. Replacement Manhole Frame 26-inch by 6-inch shall have a minimum 24-inch diameter access opening.

6. Replacement Manhole Frame 26-inch by 6-inch shall have a maximum height of 6-inches.

7.5.7 Standard Manhole Frame 32-inch by 6-inch

1. Standard Manhole Frame 32-inch by 6-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 32-inch by 6-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Standard Manhole Frame 32-inch by 6-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Standard Manhole Frame 32-inch by 6-inch shall have a minimum dimensions shall be in accordance with **32" X 6" Sewer Frame Only Detail (S-02.55).**

5. Standard Manhole Frame 32-inch by 6-inch shall have a minimum 30-1/4-inch diameter access opening.

6. Standard Manhole Frame 32-inch by 6-inch shall have a maximum height of 6-1/2-inches.

7.5.8 Standard Manhole Frame 32-inch by 8-inch

1. Standard Manhole Frame 32-inch by 8-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 32-inch by 8-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Standard Manhole Frame 32-inch by 8-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. Standard Manhole Frame 32-inch by 8-inch shall have a minimum dimensions shall be in accordance with **32" X 8" Sewer Frame Only Detail (S-02.56).**

5. Standard Manhole Frame 32-inch by 8-inch shall have a minimum 30-inch diameter access opening.

6. Standard Manhole Frame 32-inch by 8-inch shall have a maximum height of 8-inches.

7.5.9 24-inch Standard Sewer Manhole Cover

1. 24-inch Standard Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. 24-inch Standard Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. 24-inch Standard Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 24-inch Standard Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **24" Standard Sewer Cover Detail (S-02.61).**

5. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.

6. The word "SEWER" shall be raised relief.

7. 24-inch Standard Sewer Manhole Covers shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).

8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

7.5.10 32-inch Standard Sewer Manhole Cover

1. 32-inch Standard Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. 32-inch Standard Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. 32-inch Standard Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 32-inch Standard Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **32" Standard Sewer Cover Detail (S-02.62).**

5. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.

6. The word “SEWER” shall be raised relief.

7. 32-inch Standard Sewer Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 31-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-3/4-inch thick (plus or minus 1/16-inch).

8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

7.5.11 26-inch Replacement Sewer Manhole Cover

1. 26-inch Replacement Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. 26-inch Replacement Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. 26-inch Replacement Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 26-inch Replacement Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **26” Replacement Sewer Cover Detail (S-02.63).**

5. The word “SEWER” shall be raised relief.

6. 26-inch Replacement Sewer Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2inch long, a 26-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/8-inch thick (plus or minus 1/16-inch).

7. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

7.5.12 30-inch Replacement Sewer Manhole Cover

1. 30-inch Replacement Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

2. 30-inch Replacement Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. 30-inch Replacement Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

4. 30-inch Replacement Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **30" Replacement Sewer Cover Detail (S-02.64).**

5. The word "SEWER" shall be raised relief.

6. 30-inch Replacement Sewer Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole at the center, a 29-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 2-inch thick (plus or minus 1/16-inch).

7. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

7.5.13 Composite Locking 24-inch or 32-inch Sewer Cover

1. Composite Locking Manhole Covers provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Composite Locking Manhole Covers shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following exceptions and additions:

3. Composite Locking Manhole Covers provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.

4. Composite Locking Manhole Covers shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 and have a HS20 load rating.

5. Composite Locking Manhole Covers shall be strong, durable, even from fiber reinforced polymer (FRP). It shall consist of a FRP matrix consisting of between 45% to 70% fiber reinforcement by weight. Fiber reinforcement shall consist of fiberglass, carbon, aramid, basalt and/or natural fibers. The polymer matrix shall be thermoset consisting of a polyester, vinylester, epoxy, polyurethane, and/or hybrid chemical composition. The resin matrix must be thermoset. Composite

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Locking 24-inch Manhole Covers shall be smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

6. Composite Locking Manhole Covers shall be of uniform quality, with a dimensional tolerance of 1/16 of an inch. The finished product will feature a strength to weight ratio of 750:1. There shall be no possibility of corrosion welding between the cover and the frame, preventing damage to the infrastructure when opening. Gasket system shall be integrated to reduce traffic shock and abatement of noise and malodors. Static Coefficient of Friction shall be 0.6 or greater, as described in ASTM C1028 Standard, in both wet and dry applications.

7. Composite Locking Manhole Covers shall be shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.

8. The Commission requires that the Composite Locking Manhole Covers shall be subjected to proof load testing as follows:

   (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.

   (b) Composite Locking Manhole Covers shall be shall show no detrimental deformation or cracks when a proof load of 50,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

   (c) Permanent deformation shall not exceed 1/8-inch.

   (d) All testing shall be at the supplier's expense.

9. Composite Locking Manhole Covers shall have a non-slip pattern cast on the top.

10. Composite Locking Manhole Covers shall be provided with individual permanent markings that are easily discernable and show the following:

    (a) Name of the producing manufacturer and country of manufacture preceded by the words "Made in", such as "Made in USA"

    (b) AASHTO designation or ASTM designation number

    (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,

    (d) Manufacturing date (MM/DD/YY),

11. The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and

location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

12. The word "SEWER" shall be raised relief.

13. Composite Locking Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

14. Composite Locking 24-inch Manhole Cover dimensions shall be in accordance with **24" Composite Locking Sewer Cover Detail (S-02.65).**

15. The Composite Locking 24-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two ¼-turn penta head laches on each side of the cover, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).

16. Composite Locking 32-inch Manhole Cover shall fit any of the Standard 32-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

17. Composite Locking 32-inch Manhole Cover dimensions shall be in accordance with 32**" Composite Locking Sewer Cover Detail (S-02.66)**

18. The Composite Locking 32-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two ¼-turn penta head laches on each side of the cover, a 1-1/2-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).

19. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

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7.5.14 Gasketed 24-inch Sewer Cover

1. Gasketed 24-inch Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Gasketed 24-inch Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Gasketed 24-inch Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

4. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.

5. The word "SEWER" shall be raised relief.

6. The Gasketed 24-inch Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2inch long, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).

7. The Gasketed 24-inch Manhole Cover shall also include a continuous, self-sealing gasket cemented in a machine groove on the underside of the cover or as otherwise approved by the Commission.

8. The Gasketed 24-inch Manhole Frame shall have a minimum 21-3/4-inch diameter access opening.

7.5.15 Gasketed 32-inch Sewer Cover

1. Gasketed 32-inch Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Gasketed 32-inch Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:

3. Gasketed 32-inch Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

4. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.

5. The word "SEWER" shall be raised relief.

6. The Gasketed 32-inch Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2inch long, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).

7. The Gasketed 32-inch Manhole Cover shall also include a continuous, self-sealing gasket cemented in a machine groove on the underside of the cover or as otherwise approved by the Commission.

8. The Gasketed 32-inch Manhole Frame shall have a minimum 21-3/4-inch diameter access opening.

7.5.16 Pressure (locking) Manhole Frame and Cover 26-inch by 7-inch

1. Pressure (locking) Manhole Frame and Covers 24-inch by 8-inch shall meet all the requirements of the Gasketed Manhole Frame and Covers 24-inch by 8-inch with the following exceptions:

2. The 26-inch Pressure (locking) Manhole Frame shall have a seat cast in the frame to support the cover.

3. The 26-inch Pressure (locking) Manhole Frame shall have a self-sealing gasket cemented in a machine groove on the topside of the frame or as otherwise approved by the Commission.

4. Cam locks or J-bar locks shall be provided to secure the cover to the frame.

5. If cam locks are provided the 26-inch Pressure (locking) Manhole Frame shall have a minimum of three (3) cam lock supports cast into the frame. Each cam lock shall be provided with stainless steel cams, nuts, and bolts to secure cover to the frame.

6. If cam locks are provided the 26-inch Pressure (locking) Manhole Cover shall have a rabbit cast or machined around the outer diameter of the cover to allow the cam locks to secure the cover to the frame.

7. If J-bar locks are provided the 26-inch Pressure (locking) Manhole Cover shall have a minimum of three (3) J-bar locks cast into the frame. Each J-bar lock shall be provided with stainless steel J-bars, nuts, and bolts to secure cover to the frame.

8. The 26-inch Pressure (Locking) Manhole Frame shall have a minimum 24-inch diameter access opening.

7.5.17 Pressure (locking) Manhole Frame and Cover 32-inch by 7-inch

1. Pressure (locking) Manhole Frame and Covers 32-inch by 7-inch shall meet all the requirements of the Gasketed Manhole Frame and Covers 32-inch by 7-inch with the following exceptions:

2. The 32-inch Pressure (locking) Manhole Frame shall have a seat cast in the frame to support the cover.

3. The 32-inch Pressure (locking) Manhole Frame shall have a self-sealing gasket cemented in a machine groove on the topside of the frame or as otherwise approved by the Commission.

4. Cam locks or J-bar locks shall be provided to secure the cover to the frame.

5. If cam locks are provided the 32-inch Pressure (locking) Manhole Frame shall have a minimum of three (3) cam lock supports cast into the frame. Each cam lock shall be provided with stainless steel cams, nuts, and bolts to secure cover to the frame.

6. If cam locks are provided the 32-inch Pressure (locking) Manhole Cover shall have a rabbit cast or machined around the outer diameter of the cover to allow the cam locks to secure the cover to the frame.

7. If J-bar locks are provided the 32-inch Pressure (locking) Manhole Cover shall have a minimum of three (3) J-bar locks cast into the frame. Each J-bar lock shall be provided with stainless steel J-bars, nuts, and bolts to secure cover to the frame.

8. The 32-inch Pressure (Locking) Manhole Frame shall have a minimum 30-inch diameter access opening.

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7.5.18 Coatings

No coatings are required for manhole frame and covers or covers.

7.5.19 Sewer Manhole Frame and Covers Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. East Jordan Iron Works

   (a) MHF 24-inch by 4-inch, Part #: 1244 11

   (b) MHF 24-inch by 6-inch, Part #: 1246 11

   (c) MHF 24-inch by 8-inch, Part #: 1248 11

   (d) MHF 26-inch by 6-inch, Part #: 2266 11

   (e) MHF 32-inch by 6-inch, Part #: 1322 13

   (f) MHF 32-inch by 8-inch, Part #: 2008 11

   (g) Standard MHC 24-inch, Part #: 1246 74

   (h) Standard MHC 32-inch, Part #: 2006 62

   (i) Replacement MHC 26-inch, Part #: 2111 23

   (j) Replacement MHC 30-inch, Part #: 2308 22

   (k) Replacement MHC Composite Locking 24-inch, Part # COM 2401 29

   (l) Replacement MHC Composite Locking 32-inch, Part # COM 3200 __

2. Approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.

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(m) Gasketed MHF&C 24-inch by 8-inch, Part #: 00124674C03GS

(n) Gasketed MHF&C 32-inch by 8-inch, Part #: 00200662C03GS

(o) Gasketed MHF&C 24-inch by 8-inch, Part #: 00124674C03GS

(p) Gasketed MHF&C 32-inch by 8-inch, Part #: 00200662C03GS

(q) Gasketed MHC 24-inch, Part #: 00124811GS

(r) Gasketed MHC 32-inch, Part #: 00200662GS

(s) Pressure (locking) MHF&C 26-inch by 7-inch, Part #: 42339048W01

(t) Pressure (locking) MHF&C 32-inch by 7-inch, Part #: 41420041W01

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Section 7.6 FLEXIBLE MANHOLE SLEEVES/SEALS

7.6.1 General

1. Manhole sleeves, gaskets, and sealants for Pre-cast Manholes provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Manhole sleeves, gaskets, and sealants for Pre-cast Manholes shall be furnished complete with lubricants, stainless steel stops, inserts, clamps, etc.

3. Manhole sleeves, gaskets, and sealants for Pre-cast Manholes shall assure water tightness and permanent seal.

4. Delivery shall be specified in terms of number of days from receipt of order.

5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

7. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

7.6.2 Flexible Sleeve/Seals from Pre-cast Concrete Manhole Manufacturer

Flexible sleeves/seals from Pre-cast Concrete Manhole Manufacturer shall be New Lok Joint Flexible Sleeve by Interpace, A-Lok Manhole sleeve by L & L Concrete Products, Press Wedge II by Pre-Seal Basket Corporation, or equal products of another manufacturer.

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7.6.3 Flexible Sleeve/Seals Field Applied

Flexible sleeves/seals Field Applied shall be K or N Seal boot, or equal products of another manufacturer.

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Section 7.7 NON-SHRINK GROUT

1. Non-Shrink Grout provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Grout shall be non-shrink and waterproof.

3. Grout shall be Hallemite, Waterplug, Embeco or approved equal. Plastic pipes shall have a water-stop gasket secured to pipe with a stainless steel clamp.

4. Delivery shall be specified in terms of number of days from receipt of order.

5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

7. References

   The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

   (a) Name of Municipality/Utility

   (b) Total amount of product bid on and amount delivered

   (c) Date the bid was accepted and date the product was delivered

   (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

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CHAPTER 8 SEWER PUMP STATIONS

Section 8.1 SUBMERSIBLE SEWAGE PUMP STATIONS

8.1.1 General

1. The submersible pumping station shall include all materials, equipment and incidentals required to install wastewater pumping stations with all related interior piping and electrical works as specified herein and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.

2. Pumps shall be designed for use in wastewater non-clog submersible pumping stations.

3. Reference to specific manufacturers is for the purpose of establishing a quality or parameter for specification writing and not to be considered proprietary.

4. One complete spare pump with motor, power and signal cable, attachments to the guide rails, and pipe connection adaptor for the wastewater pumping station is required.

5. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

   (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.

6.

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8.1.2 Submersible Sewage Pumps – Quality Criteria

1. The system shall be furnished by a single supplier who shall be responsible for the coordination of the system design and who shall assume complete responsibility for the proper installation and operation of the system. All parts shall be properly stamped for identification and location. Nameplates giving the name of the manufacturer, the rated capacity, head, speed and all other pertinent data shall be attached to each pump and motor.

2. All equipment furnished shall be new and unused, shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of 5 years.

3. All the equipment specified herein is intended to be standard equipment for pumping all material found in domestic wastewater.

8.1.3 Submersible Sewage Pumps and Pumping System

1. The design characteristics of the pump station shall be and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, and as specified herein, unless otherwise approved by the Commission.

2. Two non-clog submersible pumps shall be installed in the pumping station wet well. The two pumps shall be programmed to operate in an alternating lead/lag mode.

3. Pumps shall be automatically started from high level switch and automatically stopped from a low level switch. An alternating switch shall be provided in the control panel such that the operation of one pump shall switch the next automatic start to the other pump. The pumps shall also be capable of manual operation from the control panel.

4. Each of the two pumps shall be sized to handle the maximum flows, thus the pumping system shall provide 100% redundancy.

5. At least one pump shall be equipped with a backwash valve or flush valve. The flush valve shall be designed to allow a minimum of 30 seconds circulation of wastewater in the wet well to re-suspend and de-sludge settled solids.

6. The non-clog pumps and motors shall be designed and manufactured so they can operate completely submerged in the sewage and wastewater. Pump motors shall run indefinitely without overheating with motors un-submerged.

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7. The centrifugal pump impeller unit shall be attached to a common motor and pump shaft of stainless steel. Pump and motor housings shall be high quality gray iron castings. Impeller shall be single vane cast iron.

8. All fasteners, excluding joint accessories, shall be made of Grade 316 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 316 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 316 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

9. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

10. The pump-motor shaft shall be sealed by two mechanical tungsten carbide faced seals within an oil filled chamber to provide clean, constant lubrication. The shaft shall be supported by an upper ball radial and thrust bearing and a two row angular contact lower bearings both grease lubricated. The upper bearing shall be supported by an O-ring sealed, movable cap so that impeller clearance may be adjusted externally for most efficient operation.

11. The motor winding and rotor shall be mounted in a sealed, submersible type housing which is able to transmit heat from motor winding to outer housing. Motor winding shall be Class F insulated and securely held in the housing with machine screws so that it may be removed in the field without the use of heat or a press.

12. Pump motors shall be air filled and shall have cooling characteristics suitable to permit continuous operation in a totally, partially or non-submerged condition. Jacket water-cooling shall not be required. The pump and motor shall be capable of running without damage for extended periods. Pump and motor shall be explosion-proof, suitable for Class 1, Division 1, Group C or D applications. Motor shall be provided with pilot thermal sensors embedded in the stator windings. Pumps shall have factory installed moisture detectors (seal failure probes) in the seal chamber.

13. The impellers shall be of the semi-open, single vane, non-clog type with the forward ends of the blades generously rounded to avoid catching trash. The blades shall be tapered toward the periphery of the impeller to generate the maximum possible shutoff head, and the outer tips of the blades shall occupy only a negligible portion of the area of the impeller throat or periphery. The impellers shall be accurately balanced before assembling.

8.1.4 Pumps Station Chambers – Wet Well and Valve Vault

1. The Wet Well and Valve Vault of the pump station shall be and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, and as specified herein, unless otherwise approved by the Commission.

2. The underground pump station chambers shall of reinforced concrete construction.

3. Pre-cast concrete barrel sections and pre-cast bases shall conform to ASTM C478, and shall meet the following requirements.

4. No pump station chamber shall be less than 72-inches in diameter.

5. The wall thickness shall not be less than:

Diameter (inches)	72	84	96
Wall Thickness (inches)	7	8	9

6. Structure walls shall be designed for an equivalent water pressure of 90 Pounds per Square Foot (PSF). Pressure diagram shall originate at finished ground surface. Lateral pressure from vehicles shall be included in accordance with AASHTO.

7. Barrel sections shall have tongue and groove gasketed joints.

8. All sections shall be cured and shall not be shipped nor subjected to loading until after 5 days after fabrication and/or repair, or when the concrete compressive strength has attained 5,000 PSI, whichever is longer.

9. Pre-cast concrete barrel sections with pre-cast top slabs shall be designed for a minimum of H-20 loading plus the weight of the soil above. Cracked and/or chipped slabs will not be accepted unless manufacturer's proposed repair methods and manufacturer's guarantees are reviewed and approved by the Commission.

10. The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on the inside of each pre-cast section.

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11. Pre-cast concrete base shall be constructed and installed as recommended by the manufacturer and/or detailed by the design engineer. However, the thickness of the bottom slab of the pre-cast base shall not be less than the manhole barrel sections or the top slab, whichever is greater. Bolting of the structure to the base slab shall be with Type 304 stainless steel bolts.

12. The pre-cast base shall be firmly anchored to a reinforced concrete slab designed such that the pumping station is able to fully resist flotation when the groundwater elevation is at the finished ground surface level.

13. The design shall resist flotation and shall account for the dead weight of the structure and base in addition to soil load above the structure. Accounting for skin friction, soil friction, or weight of equipment in the structure is not allowed. Flotation safety factor shall be not less than 1.15.

14. Entrance hatches for the concrete chambers (both wet well and valve vault) shall be aluminum single leaf 30-in by 48-in, complete with upper guide holder, chain holder, and cable holder for pumps. Hatches shall be designed with lift assisting springs for easy opening and closing, and with hold-open arm with red vinyl grip handle that automatically locks cover in the open position against weight and wind. Hatches shall be equipped with a locking mechanism that can be unlocked only by the operator.

15. Hatches shall be designed for H-20 loading.

16. Manhole rungs shall be reinforced steel, copolymer polypropylene, 14-in wide, M.A. Industries Inc, PF Series or equal. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung. Manhole rungs shall meet all OSHA requirements.No rungs shall be allowed in the wet well chamber.

17. The wet well chamber shall be supplied with pump mounting plates with upper and lower rail supports attached to the concrete with stainless steel expansion bolts. Two (2) 2-inch stainless steel pipe or fiberglass I-beam rails shall be installed between the mounting plates. The rails shall be used to raise and lower the pumps into the stations. A stainless steel lifting cable shall be attached to the top of each station chamber and to the top of each pump assembly.

18. The valve vault shall be designed with a minimum internal vertical clearance of 7-feet.

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8.1.5 Pumps Station Controls and Ancillary Equipment

1. Sealed tilt type switches shall be supplied to control wet well level and alarm signal. The mercury switches shall be sealed in a solid polyurethane float for corrosion and shock resistance. The support wire shall have a heavy Neoprene jacket. A weight shall be attached to each cord above the float to hold each switch in place in the wet well. The weight shall be placed above or inside the float to effectively prevent sharp bends in the cord when the float operates. The float switches shall hang in the wet well supported only by the cord. Four float switches shall be used to control and signal level; one for high level alarm, one for pump turn-on, one for pump turn-off and one for low-level alarm.

2. The Commission may approve an alternate wet well level control set up utilizing an ultrasonic level transducer and one tilt type switch for high level alarm. The Commission may consider this method if the Commission is satisfied that physical and hydraulic conditions in the wet well do not impede the accuracy of the ultrasonic transducer readings. The Commission reserves the right to reject this method at its own discretion.

3. Level settings shall be as designed to ensure a minimum pumping cycle of 15 minutes under maximum flows.

4. Power cables shall be suitable for submersible pump and Class 1, Division 1, Group C or D applications. Cable sizing shall conform to National Electrical Code specifications for pump motors. Cable entry to each pump motor shall be designed for submersible pump applications. The cable entry junction box and motor shall be separated by a stator load sealing gland which shall isolate the motor interior from foreign materials gaining access through the pump top. The electrical power cords shall be sealed by use of a cord grip, with individual conductors additionally sealed into the cord cap assemblies with epoxy sealing compound.

5. The cord grip shall have a male tapered pipe thread, threaded into a female tapered pipe thread in a cord cap. The cord cap shall be sealed into the motor housing with an O-ring. The pumps shall be supplied with a sufficient length of cord to connect to junction boxes inside the station.

6. Level settings shall be as follows:

   (a) On wet well level rise, the "pump OFF" level mercury switch shall be energized. When the level reaches the "pump ON" level switch, it shall be energized and send a signal to the control panel and automatically turn on a pump. One pump shall operate until the wet well level drops down to the "pump off" and the switch automatically turns the pump off. Under normal operation, the duty and standby pumps shall alternate service after each pump cycle is complete and the in-service pump called to stop.

(b) If wet well level rises to the high water level or falls to the low water level, the alarm level switches shall be energized with an alarm signal that there is a malfunction at the Pumping Station. Upon high water level alarm, the duty pump shall be called to stop and the standby pump shall be started in its place. The high water alarm shall also disable the alternation circuit to prevent re-starting of the faulty pump. A momentary contact pushbutton shall be provided and mounted within the control panel to reset the alternator circuit once both pumps have become operational.

(c) Should the duty pump fail to start, the standby pump shall be automatically started after a one minute time delay, the failed duty pump shall be locked out, an alarm transmitted and the standby pump shall continue to operate through every cycle. Both pumps shall not be capable of running at the same time when operating in the automatic mode. Each pump shall be capable of being operated manually from the control panel. All level switches shall be adjusted for level setting from the surface.

7. Each float switch shall have a sufficient length of cord, be intended for submersible service and Class 1, Division 1, Group C or D applications, such that the switches can be connected to junction boxes inside the station.

8.1.6 Pumps Station Control Panels

1. The control panels shall be housed in the emergency generator building.

2. Unless approved by the Commission, power supply to the control panels shall be 480 Volts, 3-Phase, 60 Hz. A combination motor circuit protector / disconnect switch and magnetic starter with Class 10 overload protection, and two NO, two NC contacts shall be provided for each pump.

3. The motor circuit protector disconnect switch shall have short circuit rating of 22,000 AIC and shall be interlocked with the door handle of the control panel. An interlock relay shall be provided to automatically re-connect the control circuit in case of circuit breaker trip on one pump. Each pump control circuit shall be supplied with an H-O-A switch, on-off lights LED Type Cluster and running time meter.

4. An automatic alternator shall be provided to alternate the sequence of operation of the pumps on the completion of each pumping cycle. Terminal strips shall be provided for connecting pump and control wires. Additional terminals shall be provided to connect alarms. A transformer shall be supplied to provide 24-volt power to the control circuit. An essentially safe barrier relay shall be provided between each float level switch and the terminal strip in the pump control panel. Relays shall be GEM Safe-Pac Division of Delaval or equal.

5. Lockout-Tag out provision shall be provided. At a minimum, provisions shall be provided to padlock unit disconnect handles in the OFF position with up to three padlocks.

6. The following control panel mounted indicating lights and nameplates shall be included:

   (a) High Level

   (b) Low Level

   (c) Moisture in Motor No. 1

   (d) Moisture in Motor No. 2

   (e) Over-heating - Motor No. 1

   (f) Over-heating - Motor No. 2

7. All alarms shall be common to an output contact rated 5 amperes at 120 VAC. See SCADA requirements in Section---

8.1.7 Pumps Station Communication System

1. The pump station shall be equipped with radio contact and SCADA system for relay of alarms and monitoring signals to pump station operator.

2. Radio/SCADA systems must be compatible with the Springfield Water and Sewer Commission Operator's system, namely United Water (UW). Contact UW at (413) 732-0293 for coordination of design/procurement of communications equipment.

8.1.8 Pumps Station Piping and Valves

1. Ductile iron (DI) pipe shall be used for sewer pump station piping and shall be in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission.

2. DI pipe shall conform to AWWA C151, and shall in accordance with the Commission's Material Specifications for Water Pipe – Flanged Ductile Iron Pipe, unless otherwise approved by the Commission.

3. Gaskets shall be full-face rubber ethylene propylene diene Monomer (EPDM) rubber in accordance with ASTM standard D-1418 with cloth insertion, 1/8-in thick and shall conform to the dimensions shown in Table A.1 of AWWA C115, unless otherwise approved by the Commission.

4. Flanged joints shall be supplied with bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall conform to the same standard as the flange. Low carbon steel bolts and nuts shall conform to ASTM A307, Grade B.

5. Fittings shall be ductile iron, shall have the same pressure rating as the DI pipe, shall be in accordance with the Commission's Material Specifications for Ductile Iron Pipe Fittings and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission Fittings.

6. All pipe and fittings shall have a double thick cement mortar lining and bituminous seal coat on the inside, in accordance with AWWA C104.

7. All pipe and fittings shall have a bituminous seal coat on the outside, in accordance with AWWA C104.

8. The valves for isolation shall be flanged gate valves, and shall be in accordance with the Commission's Material Specifications for Gates Valves for pressure class 250, and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission

9. The check valves required for prevention of backflow shall be flanged, 250 psi working pressure, bronze-mounted, with bronze seat ring and bronze gate ring. Check valves shall comply with the applicable portions of AWWA Standard for Gate Valves. Valves shall be fitted with an extended hinge arm with outside lever and spring.

10. Sleeve type couplings for exposed ductile iron pipe shall be of steel construction and shall be in accordance with the Commission's Material Specifications for Couplings, and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission. Gaskets shall be of a composition resistant to wastewater components.

8.1.9 Pressure Gauges

1. Pump Station Pressure Gauges shall have a 4-1/2-in nominal diameter black case with phosphor bronze Bourdon tubes (beryllium copper bellows), 1/4-in NPT male connections, stainless steel rack and pinion movement micro-adjustment for calibration, white dials and black figures and threaded ring case. All gauges shall be furnished with factory mounted protective diaphragm attachment suitable for wastewater service. Gauges shall read 0 to 50 PSI unless otherwise required by design conditions and as approved by the Commission.

2. Pump Station Pressure Gauges shall be provided with copper nipples complete with "T"-handle cocks. Nipples shall be at least 2-in long and provided with elbows for easy installation and reading of the gauges.

3. Gauges shall be manufactured by U.S. Gauge, Feasterville, PA; Crosby-Ashton, Wrentham, MA; or approved equal.

8.1.10 Vent

1. Vent shall be Steel Schedule 40, ASTM A53, hot-dipped galvanized with threaded, 150 lb, hot-dipped galvanized malleable iron fittings.

2. Vent shall be provided with a stainless steel bug screen.

3. The Commission may consider an alternate, such as Schedule 80 PVC for material depending on Pump Station location, site accessibility and proximity to traffic. Approval of this alternative is at the sole discretion of the Commission.

8.1.11 Emergency Power Generation

1. Pump station shall be equipped with a stand-by emergency power generation source.

2. Power generators shall be provided to supply adequate power required to energize the pumps at full flow capacity, and the pump station electrical and incidental systems.

3. Type of fuel, storage capacity, and storage location shall be approved by the City of Springfield Fire Department.

4. Power generators shall be Cummins, Caterpillar, or approved equal.

8.1.12 Housing for the Emergency Power Generation

1. The housing shall be pre-cast concrete building and sized and configured to adequately house all equipment and incidentals specified herein including, but not limited to, the emergency power generator, pump station control panels, transfer switch, generator controls, heaters, SCADA and communication equipment, and anything else incidental to the pump station design and as required by the design engineer.

2. The building shall meet American Concrete Institute (ACI) 318-02, the Building Code Requirements for Structural Concrete IBC 2003, and City of Springfield Code Enforcement requirements, all the latest versions,

3. Minimum design criteria:

(a) Floor live load: as required by weight of generator. Minimum 150 psf

(b) Roof live load:60 psf unless otherwise directed by the design engineer

(c) Wind Load: 130 mph

(d) Load factors: Live = 1.7; Dead = 1.4

(e) Concrete minimum compressive strength: 5,000 psi @ 28 days, reinforcing steel shall meet ASTM A615, Grade 60

4. The housing shall be suitable for securing the power generator unit; shall provide weather and sound attenuation; and shall be designed to meet the cooling air flow, heat exchange, exhaust air, sound muffling, space heating and all else required by the emergency generator unit manufacturer.

5. The housing façade shall be brick, wood, vinyl, or other type of siding as approved by the Commission. The Commission shall select the building façade type that is most similar to the pump station area houses/buildings.

6. Roof shall consist of weather proof shingles and UV blockers, shall be resistive to cracking and splitting and shall be non-combustible providing a UL Class A fire rating.

7. Prefabricated housing units may be proposed for the Commission's consideration. The Commission reserves the right to approve or reject this alternative at its sole discretion.

8.1.13 Pump Station Site

Pump station site shall be in accordance with the Commission's Guidelines and Policies.

8.1.14 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.

2. Shop drawings detailing all materials, equipment performance information, and design drawings including structural, architectural, mechanical, civil and general. All design drawings shall be stamped by a professional engineer registered in the Commonwealth of Massachusetts.

3. Pumps manufacturer shall include rating curves and details of pump construction. The curves shall indicate head, discharge rate, pump efficiency, and horsepower characteristics throughout the full operating range.

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4. Stand-by power generator manufacturer shall include generator unit dimensions, weight, fuel consumption rates, radiator cooling air requirement, combustion air volume, heat radiated to room, noise level, and all else required for completing the pump station design.

5. A pump station testing, startup, and operation plan listing name of qualified pump station operator(s) who is responsible of testing, operating, maintaining, and monitoring the pump station.

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CHAPTER 9 LOW PRESSURE SANITARY SEWER SYSTEMS

Section 9.1 Low Pressure Sanitary Sewer (LPSS) Systems

9.1.1 Low Pressure Sanitary Sewer – General

1. The Low Pressure Sanitary Sewer System shall include all materials, equipment and incidentals required to install the low pressure system, the low pressure lateral, and the grinder pump station with all related piping, structures, boxes, pump stations, and electrical works as specified herein and in accordance with the **Low Pressure Sanitary Service / Main 2-1/2-inch Valve Box in Non-Paved Areas Detail (S-09.1)**, **Low Pressure Sanitary Sewer Pipe Trench Detail (S-09.2), Low Pressure Sanitary Sewer Service Lateral Detail (S-09.3), Low Pressure Sanitary Sewer Main Inline Flushing Structure Detail (S-09.4), and Low Pressure Sanitary Sewer Terminal flushing Structure Detail (S-09.5),** unless otherwise approved by the Commission.

2. Pumps shall be designed for use in wastewater non-clog submersible pumping stations.

3. Reference to specific manufacturers is for the purpose of establishing a quality or parameter for specification writing and not to be considered proprietary.

4. One complete spare pump with motor, power and signal cable, attachments to the guide rails, and pipe connection adaptor for the wastewater pumping station is required.

5. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;

   (a) North America shall mean the United States, Canada, and Mexico,

   (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,

   (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and

   (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or

6. The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.

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7. Delivery shall be specified in terms of number of days from receipt of order.

8. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.

9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.

10. References

    (a) The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

    - Name of Municipality/Utility
    - Total amount of product bid on and amount delivered
    - Date the bid was accepted and date the product was delivered
    - Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

11. This specification section is intended to establish the minimum criteria and requirements for private grinder pump stations to be installed on private property for sewer service for a location which cannot be served by gravity sewer.

12. The Commission is not responsible for the design, procurement, delivery, installation, and maintenance of grinder pump station units.

13. Each grinder pump station shall conform to all state, federal, and local regulations, and meet accepted standards for plumbing equipment for use near residences. It shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the National Sanitation Foundation seal.

14. Sewage grinder pump stations and appurtenances are private structures that are to be owned, operated, and maintained by the property Owner.

15. The grinder pump station supplier, or manufacturer, and project Engineer of Record shall participate in the installation and start-up testing of the grinder pump station.

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9.1.2 Low Pressure Sanitary Sewer – Mains < 3 inch Diameter

1. Pipe provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.

2. Pipe provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

3. All pipe and fittings furnished shall be clearly marked on the outside indicating name, manufacturer, nominal diameter, ASTM, schedule, and/or pipe or pressure class designation.

4. All materials used for the pressure portion of these systems must be pressure rated at a minimum of 160 psi operating pressure and suitable for the wastewater environment and resistant to corrosion.

5. All pipe and fittings shall be 100 percent hydrostatically tested to 150 psi in the factory.

6. All metal components and hardware shall be 304 stainless steel unless otherwise specified herein or approved by the SWSC.

7. Pipe and fitting material shall be one of the following SDR-21 PVC, Sch 40 PVC, or SDR-11 HDPE per ASTM D 3035. Final determination of the type and size is the responsibility of the project owner's consulting engineer (MA P.E.) and must be approved by the SWSC.

9.1.3 Low Pressure Sanitary Sewer – Mains < 3 inch Diameter – Pre-Insulated

1. Pre-Insulated Pipe provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 and Section 9.1.2 of these Material Specifications.

2. The insulation shall be a foamed in place closed cell polyurethane which completely fills the annular space between the carrier pipe and the exterior casing. The insulation shall have the following physical properties:

   (a) Minimum Density (lb./cu. ft.) 2.0 ASTM D-1621

   (b) Closed Cell ASTM D-2856

   (c) "K" Factor BTU/Hr. sq. ft. °F/in. 147 ASTM C-177

3. The exterior casing shall be High Density Polyethylene (H.D.P.E.) ASTM D-1248 with the following physical properties:

(a) ASTM D-3350…Resin Type III, Grade P34

(b) ASTM D-638…Ultimate Elongation 850%

(c) ASTM D-638…Tensile Yield Strength 3300 psi

(d) ASTM D-790…Tangent Flexural Modules 175,000 psi

4. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

   (a) Urecon Pre-Insulated Pipe,

   (b) Perma Pipe,

   (c) Tricon, or

   (d) Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.

9.1.4 Low Pressure Sewer System – Engineered Thermoplastic Fittings

1. Plastic fitting components provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with all applicable ASTM standards, this Specification, and Section 9.1.1 of these Material Specifications.

2. All pipe connections shall be made using compression fitting connections including a Buna-N O-ring for sealing to the outside diameter of the pipe. A split-collet locking device shall be integrated into all pipe connection fittings to securely restrain the pipe from hydraulic pressure and external loading caused by shifting and settling.

9.1.5 Low Pressure Sewer System – Service Lateral Kit

1. The Service Lateral Kit provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.

2. The Service Lateral Kit shall prevent backflow from the sewer main and into the grinder pump station.

3. The Service Lateral Kit shall be sized to match LPSS main pipe diameter.

4. The Service Lateral Kit (exclusive of piping) shall consist of three (3) compression fittings, one (1) combination curb stop/check valve assembly and one (1) curb box.

5. The Curb Stop and Check Valve Assembly shall be 316 stainless steel and have a two-piece cast 316 stainless steel housing, creating a unilateral body. All plastic compression fittings are to be molded from polypropylene and shall be tested for resistance to aging, pressure rating, tensile strength, and flexural strength. All components shall incorporate compression fitting connections for easy, reliable installation of piping. The lateral kit shall be rated for 150 psi service.

6. Curb Stop and Check Valve Assembly shall be designed for use with HDPE and PVC pressure sewer piping.

7. Curb Stop and Check Valve Assembly shall be an integrated stainless steel ball valve curb stop and check valve and be fully field serviceable with a top service port that allows access to check valve and hinge pin.

8. Curb Stop and Check Valve Assembly shall be designed and tested to 235 psi service pressure.

9. Curb Stop and Check Valve Assembly shall be pressure-tight in both directions. The ball valve actuator shall include position stop features at the fully opened and closed positions.

10. Curb Stop and Check Valve Assembly check valve shall be integral with the curb stop valve. The check valve will provide a full-ported 1-1/4" passageway and shall introduce minimal friction loss at maximum rated flow. The flapper hinge design shall provide a maximum degree of freedom and ensure seating at low back pressure.

11. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

    (a) Uni-Lateral E/One assembly — NB0184PXX or NC0193GXX, or

    (b) Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.

9.1.6 Terminal Flushing Structure

1. The Terminal Flushing Structure provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.

2. The Terminal Flushing Structure shall be standard pre-cast barrel section combinations of 1', 2', 3' or 4' lengths as needed.

3. Pre-cast reinforced concrete manhole sections conforming to ASTM c478.

4. Pre-cast reinforced manhole sections shall have design loading per AASHTO HS20-44, ACI 318-83; ASTM c478-82, c890-82, c913-71.

5. Pre-cast reinforced manhole sections shall be either tongue and groove joints or bell and spigot joints with the following gaskets:

   (a) Tongue & groove gasket shall be o-ring rubber gasket conforming to ASTM c443

   (b) Bell & spigot gasket shall be butyl rubber gasket joints conforming to ASTM c990

6. The Terminal Flushing Structure shall be provided with (2) coats of bituminous damp proofing.

7. Pre-cast reinforced concrete manhole concrete and reinforcing shall conform to the following:

   (a) Pre-cast concrete shall be 5,000 psi @ 28 days.

   (b) Admixtures, air & plasticizers per ASTM c233-82.

   (c) Reinforcing per ASTM a615 for wire fabric.

8. The Terminal Flushing Structure shall be provided with one (1) 316 stainless steel fully ported quarter turn ball valve, with a corrosion resistant handle and installed inside the manhole and the following:

   (a) A 1-inch MPT 316 stainless steel flushing connection and cap.

   (b) The LPSS pipe, fittings, and valves shall be restrained every 18-inches with ¾-inch threaded rod 1-1/2-inch wide X 1/8-inch thick anchor straps.

9.1.7 Inline Flushing Structure

1. The Inline Flushing Structure provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Sections 9.1.1 and 9.1.6 of these Material Specifications.

2. The Inline Flushing Structure shall be provided with two (2) 316 stainless steel fully ported quarter turn ball valve, with a corrosion resistant handle and installed inside the manholes.

9.1.8 Sanitary Sewer Manhole

1. The Sanitary Sewer Manhole provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 7.5 of these Material Specifications.

2. Frame shall be a standard 32-inch by 8-inch in accordance with **Sewer Frame and Cover Detail (S-02.56 and 02.62)**

9.1.9 Detectable Warning Tape

1. Detectable Warning Tape provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.

2. Detectable warning tape shall meet the following requirements:

   (a) "Caution Buried Force Main Below", green color for sewer

   (b) Minimum thickness of 5-mil, with a solid aluminum foil core.

   (c) Construction is 2-mil clear film, reverse print laminated to aluminum foil to 2-mil clear fill making the film permanently printed.

   (d) Minimum width of 3 inches

   (e) Color coded green for sewer

   (f) Tensile strength of 35 lfs/in (15,000psi)

   (g) Elongation of 80%

   (h) Adhesives with a value of Morton 548 or higher

   (i) Bottom layer of virgin PE

   (j) Top layer of virgin PET printability value of 45 dynes

   (k) Rated for direct burial

   (l) Proline part #103123083 or approved equal

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9.1.10 LPSS Service Lateral Valve Box

1. LPSS Service Lateral Valve Box provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification, Section 4.5, and Section 9.1.1 of these Material Specifications.

2. LPSS Service Lateral Valve Box shall have the word “SEWER” cast into cover.

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SPRINGFIELD WATER AND SEWER COMMISSION

STANDARD DETAILS

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SPRINGFIELD WATER AND SEWER COMMISSION

STANDARD DETAILS

Version 4 – November 1, 2020
Revised: August 12, 2021

William E. Leonard, Commissioner
Vanessa Otero, Commissioner
Daniel Rodriguez, Commissioner

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Springfield Water and Sewer Commission

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52. (W-13.7) 32-INCH STANDARD WATER COVER

53. (W-13.8) 24-INCH REPLACEMENT WATER COVER

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61. (W-14.0) THRUST BLOCK BEHIND FITTING

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71. (S-02.1) PRECAST CONCRETE SEWER PIPE CONNECTIONS

72. (S-02.2) END OF SEWER MAIN

73. (S-02.3) EXTERIOR DROP MANHOLE

74. (S-02.4) INTERIOR DROP MANHOLE

75. (S-02.51) 24-INCH X 4-INCH FRAME ONLY

76. (S-02.52) 24-INCH X 6-INCH FRAME ONLY

77. (S-02.53) 24-INCH X 8-INCH FRAME ONLY

78. (S-02.54) 26-INCH X 6-INCH FRAME ONLY

79. (S-02.55) 32-INCH X 6-INCH FRAME ONLY

Springfield Water and Sewer Commission

Standard Detail Drawings

80. (S-02.56) 32-INCH X 8 INCH FRAME ONLY

81. (S-02.61) 24-INCH STANDARD SEWER COVER

82. (S-02.62) 32-INCH STANDARD SEWER COVER

83. (S-02.63) 26-INCH REPLACEMENT SEWER COVER

84. (S-02.64) 30-INCH REPLACEMENT SEWER COVER

85. (S-02.65) 24-INCH COMPOSITE LOCKING COVER

86. (S-02.66) 32-INCH COMPOSITE LOCKING COVER

87. (S-03.0) UTILITY CROSSING DETAIL

88. (S-04.0) EXISTING SEWER MAIN TO BUILDING CONNECTION

89. (S-04.1) NEW SEWER MAIN TO BUILDING CONNECTION

90. (S-04.2) CLEAN OUT WITH SWEEP

91. (S-04.3) SEWER SERVICE CONNECTION WITH CHIMNEY GREATER THAN 12 FT DEEP

92. (S-04.4) BUILDING CONNECTION TO SEWER MAIN WITH CONFLICTS

93. (S-05.0) BUILDING AND MAINLINE SEWER REPAIR

94. (S-06.0) WETWELL AND VALVE VAULT PRECAST

95. (S-08.0) STANDARD EXTERNAL GREASE INTERCEPTOR

96. (S-09.1) LOW PRESSURE SANITARY SERVICE/MAIN 2-1/2” VALVE BOX IN NON-PAVED AREAS

97. (S-09.2) LOW PRESSURE SANITARY SEWER PIPE TRENCH DETAIL

98. (S-09.3) LPSS SERVICE LATERAL DETAIL

99. (S-09.4) LOW PRESSURE SANITARY SEWER MAIN INLINE FLUSHING STRUCTURE DETAIL

100. (S-09.5) LOW PRESSURE SANITARY SEWER MAIN TERMINAL FLUSHING STRUCTURE DETAIL

Springfield Water and Sewer Commission

Standard Detail Drawings

MAP DETAILS

101. (M-01.0) SPRINGFIELD WATER MAINS SERVICE AREA MAP

102. (M-02.0) LUDLOW WATER MAINS SERVICE AREA MAP

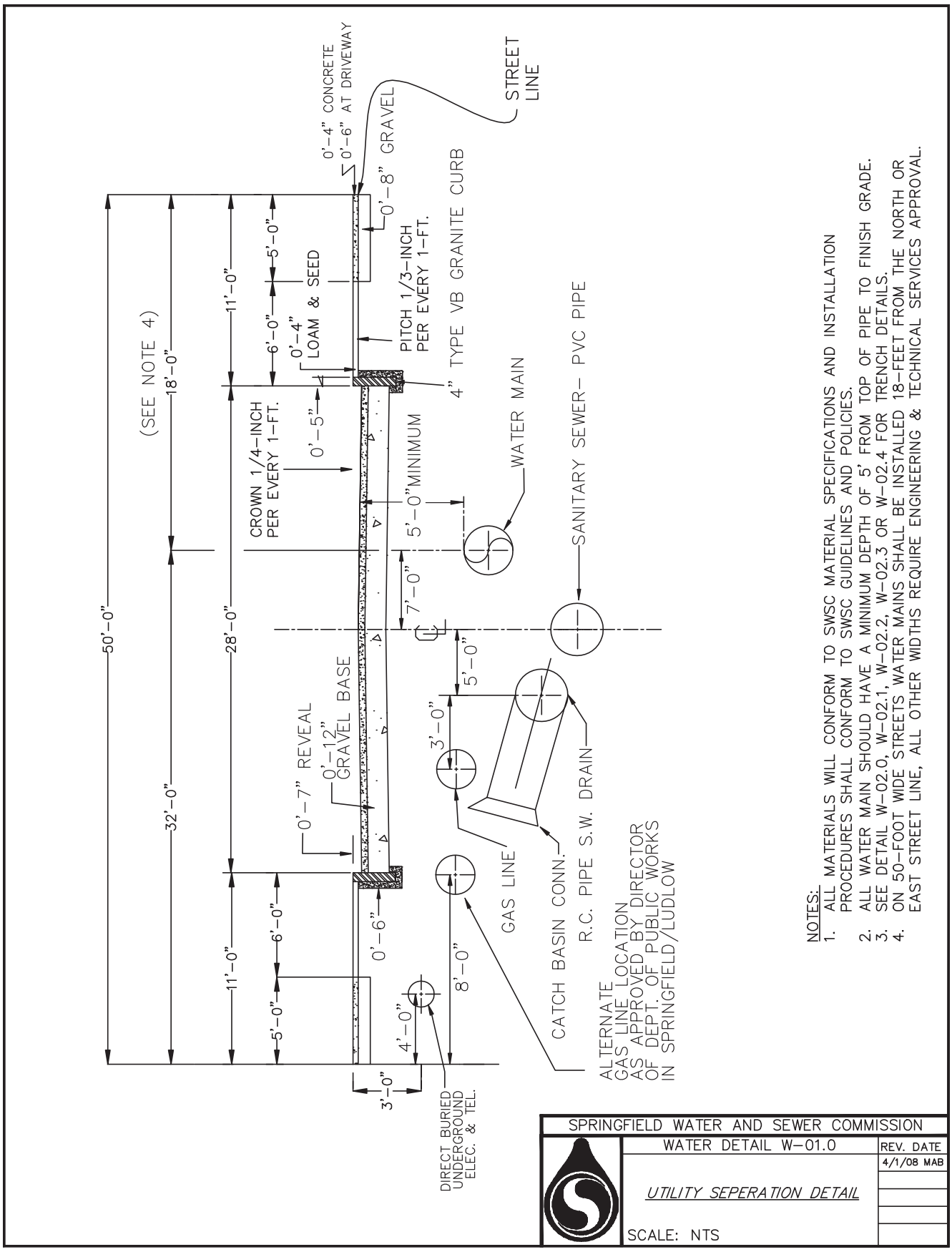
103. (M-03.0) WATER TRANSMISSION MAINS SERVICE AREA MAP COBBLE MOUNTAIN TO PROVIN MOUNTAIN

104. (M-03.1) WATER TRANSMISSION MAINS SERVICE AREA MAP PROVIN MOUNTAIN TO SPRINGFIELD

105. M-04.0) SPRINGFIELD SEWER MAINS SERVICE AREA MAP

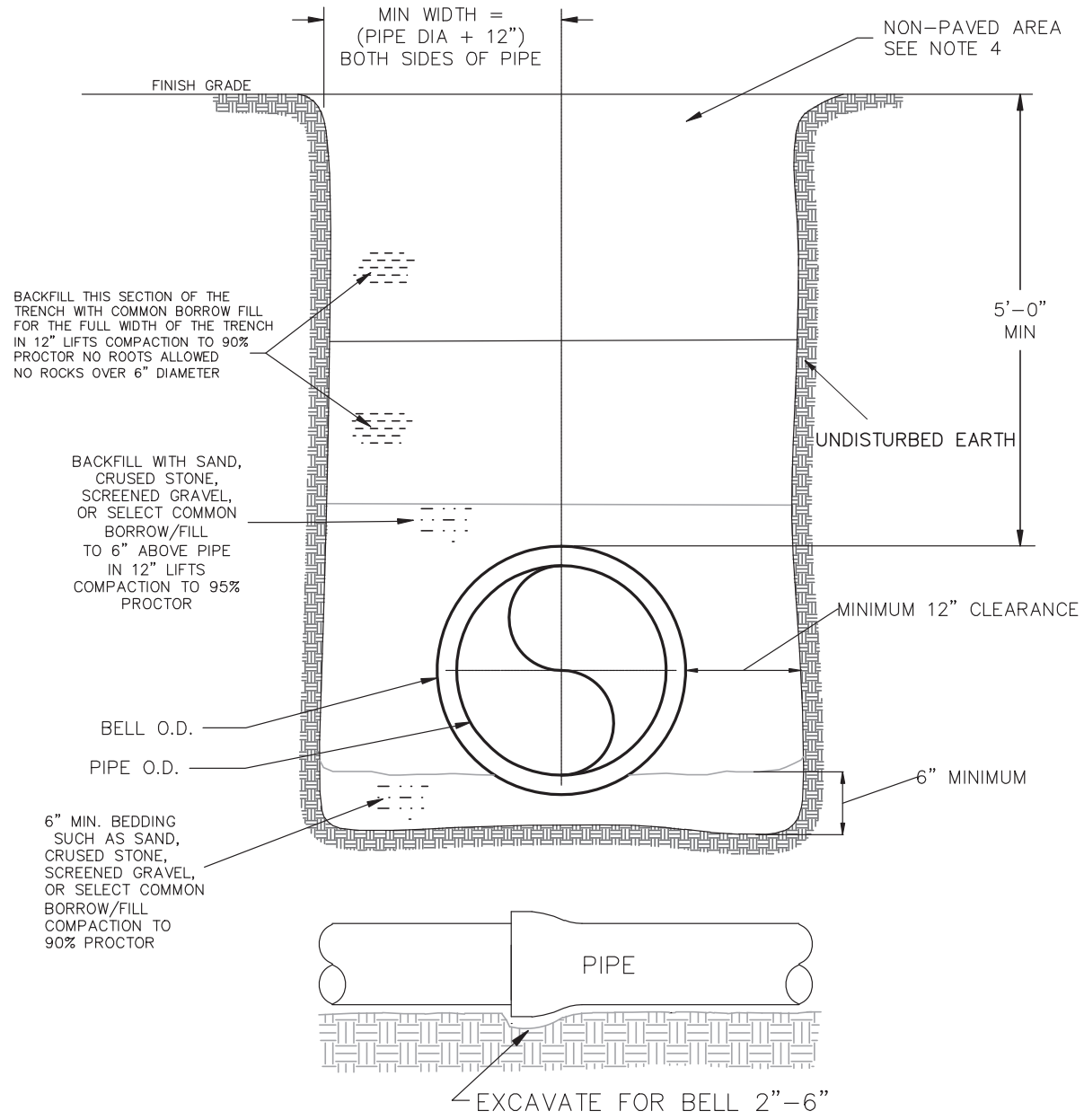
Springfield Water and Sewer Commission

Standard Detail Drawings



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ON 50-FOOT WIDE STREETS WATER MAINS SHALL BE INSTALLED 18-FEET FROM THE NORTH OR EAST STREET LINE, ALL OTHER WIDTHS REQUIRE ENGINEERING & TECHNICAL SERVICES APPROVAL.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-01.0	REV. DATE
		4/1/08 MAB
	UTILITY SEPERATION DETAIL	
	SCALE: NTS	



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
5. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DTAIL (W-01.0).

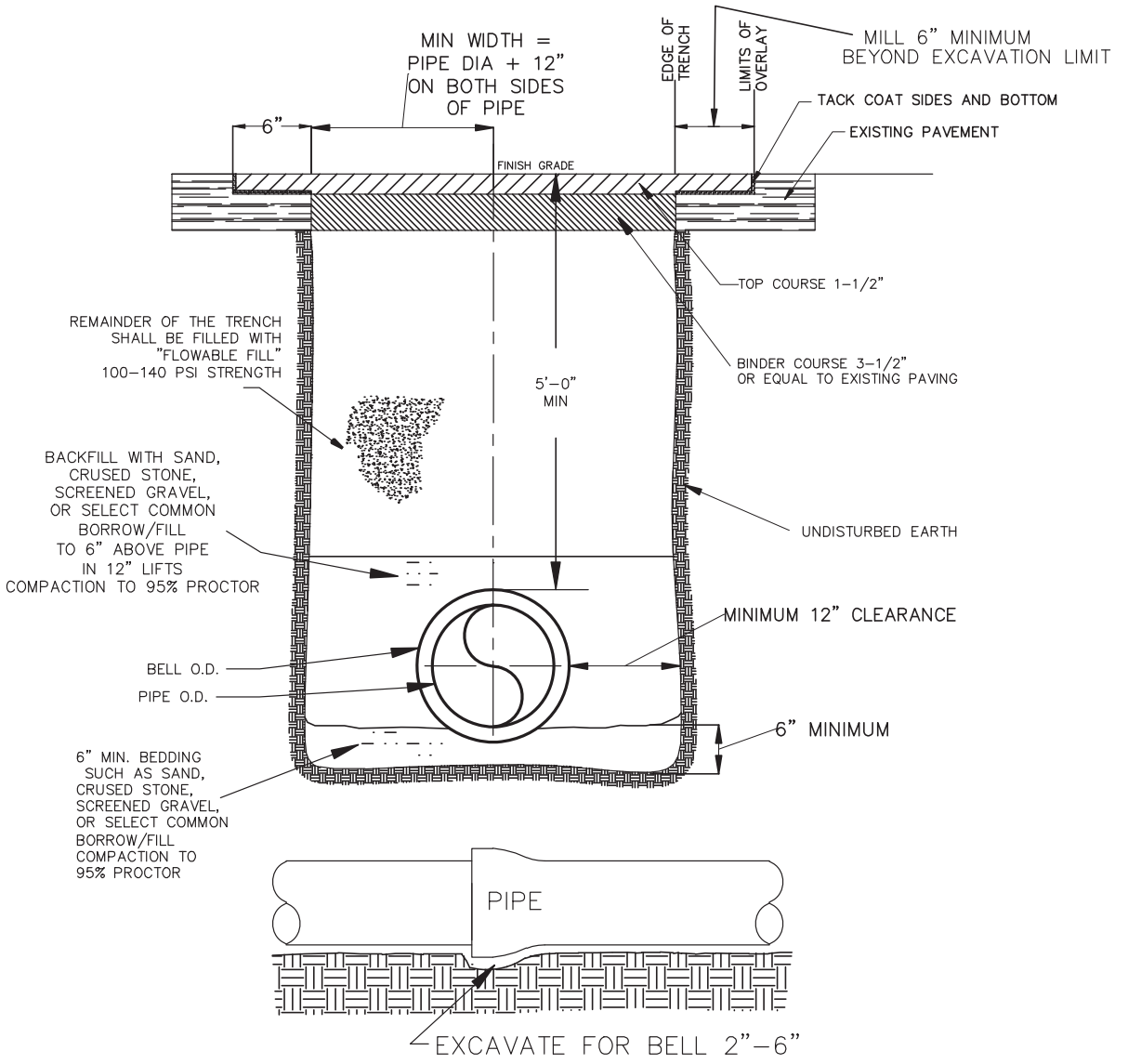
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.0

NON-PAVED AREA TRENCH DETAIL

SCALE: NTS

REV. DATE
4/1/08 MAB



NOTES:
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2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

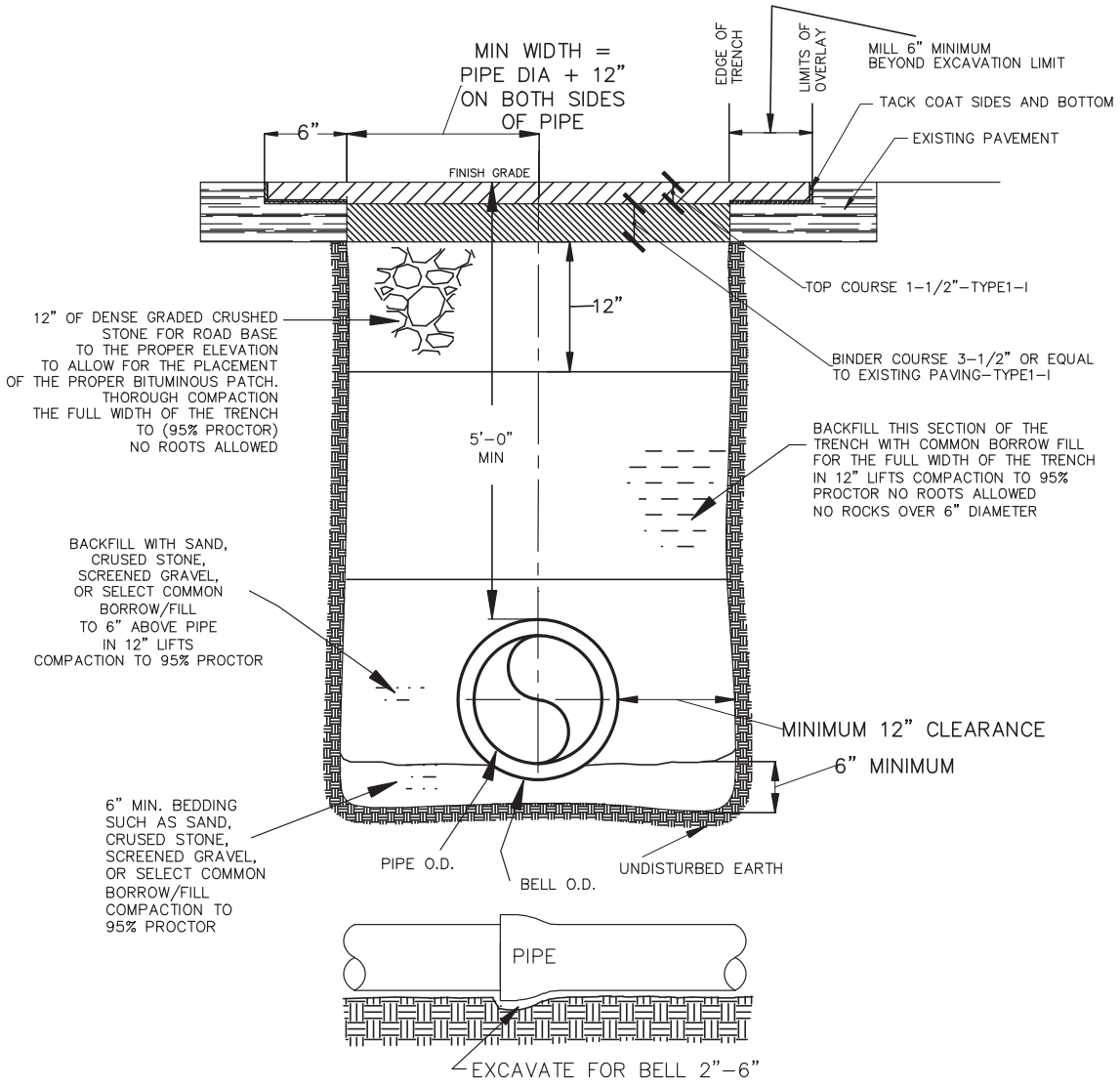
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.1

TRENCH BACKFILLING-METHOD 1 FOR LUDLOW ROADWAYS

SCALE: NTS

REV. DATE
4/1/08 MAB



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

EXISTING PAVEMENT
DENSE GRADED CRUSHED STONE
BEDDING SAND
MILLED AND REPLACED WITH TOP COURSE
EXCAVATED AND REPLACED WITH BINDER COURSE
COMMON BORROW
TACK COAT
UNDISTURBED EARTH

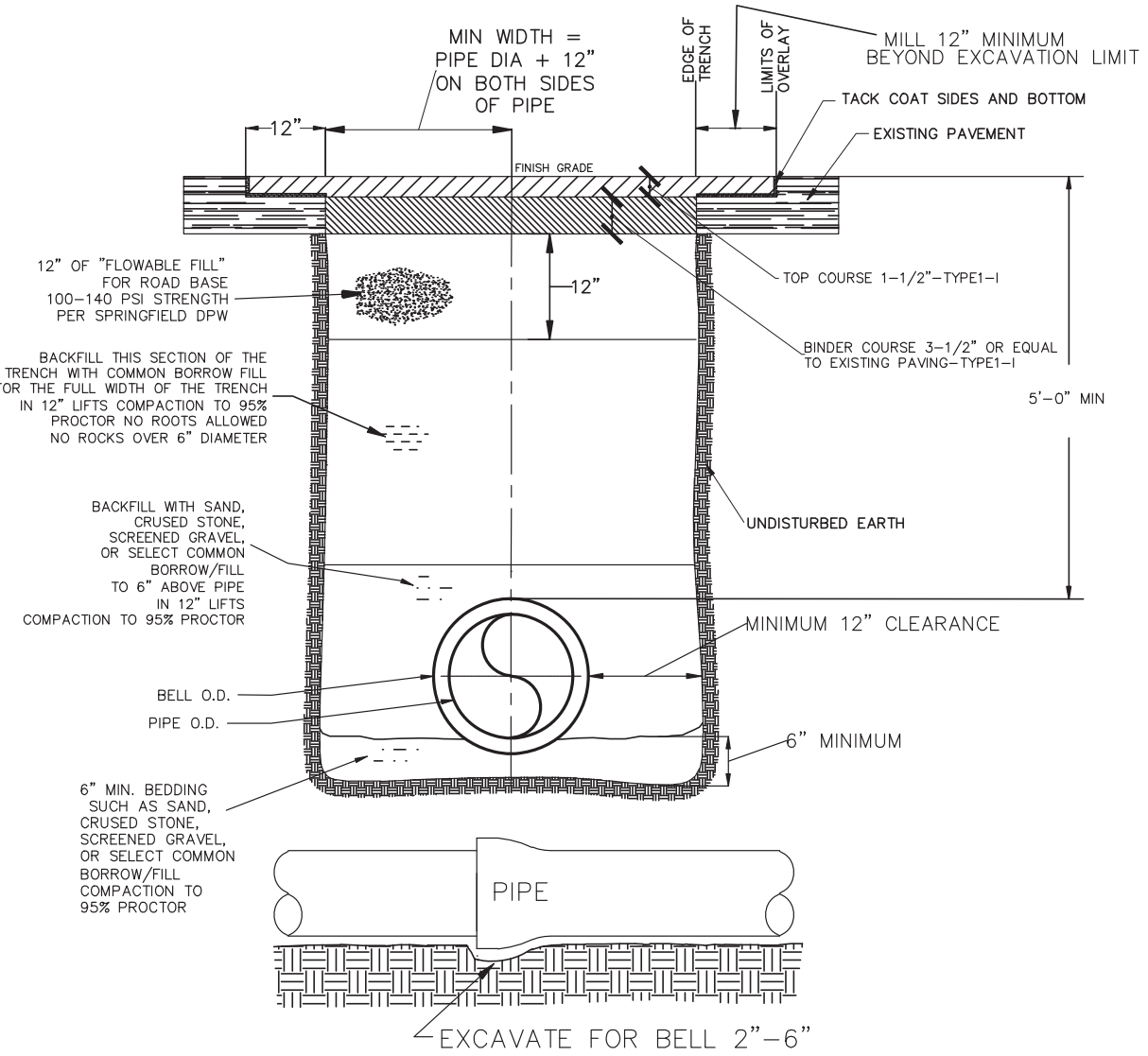
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.2

TRENCH BACKFILLING-METHOD 2 FOR LUDLOW ROADWAYS

SCALE: NTS

REV. DATE
4/1/08 MAB
6/18/08 MAB



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

EXISTING PAVEMENT
BEDDING SAND
MILLED AND REPLACED WITH TOP COURSE
UNDISTURBED EARTH
EXCAVATED AND REPLACED WITH BINDER COURSE
FLOWABLE FILL
COMMON BORROW
TACK COAT

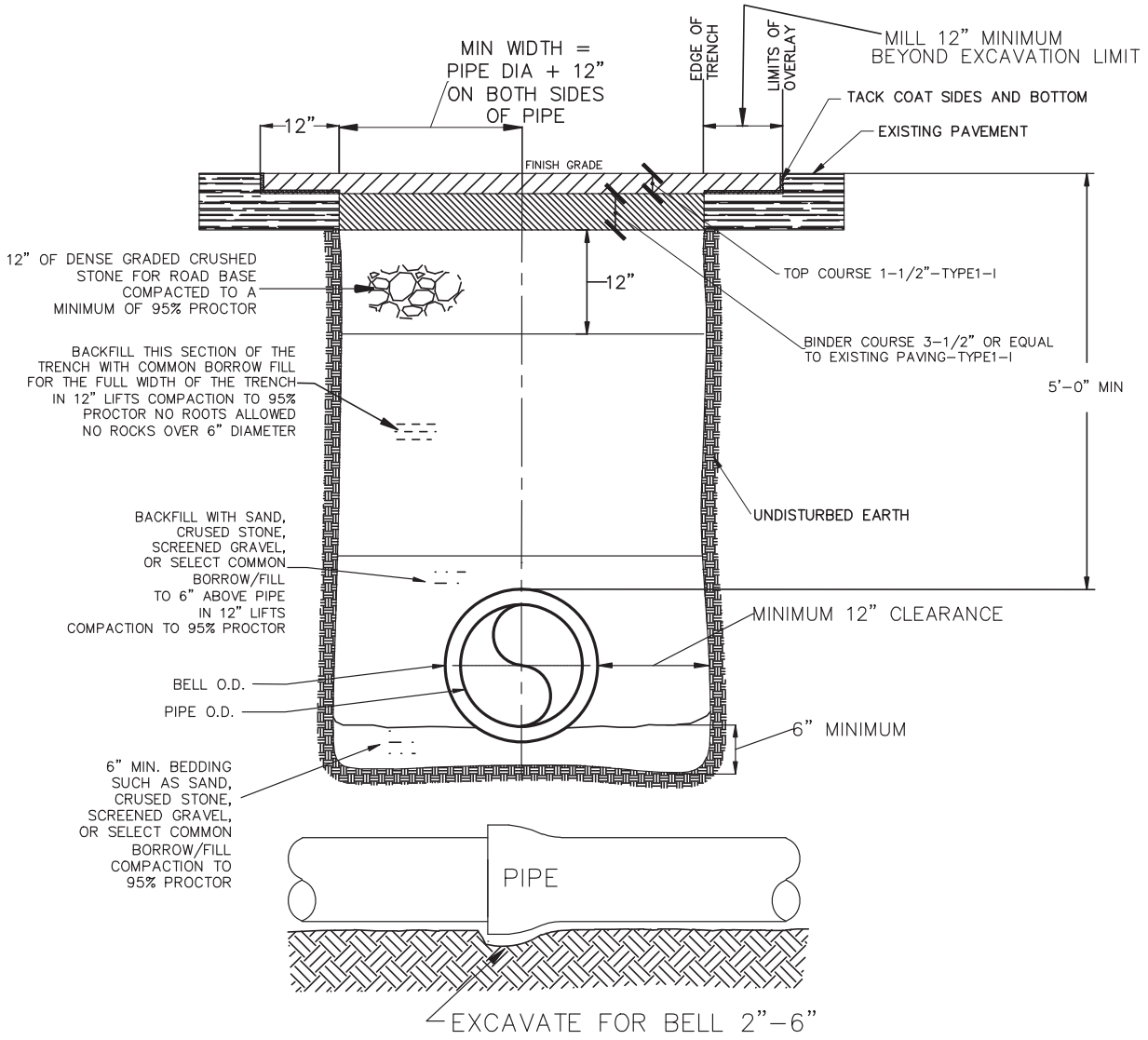
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.3

TRENCH BACKFILLING-METHOD FOR ARTERIAL STREETS IN SPRINGFIELD

SCALE: NTS

REV. DATE
4/1/08 MAB
6/18/08 MAB



NOTES:
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2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
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12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
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14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

EXISTING PAVEMENT
EXCAVATED AND REPLACED WITH BINDER COURSE
DENSE GRADED CRUSHED STONE
COMMON BORROW
BEDDING SAND
TACK COAT
MILLED AND REPLACED WITH TOP COURSE
UNDISTURBED EARTH

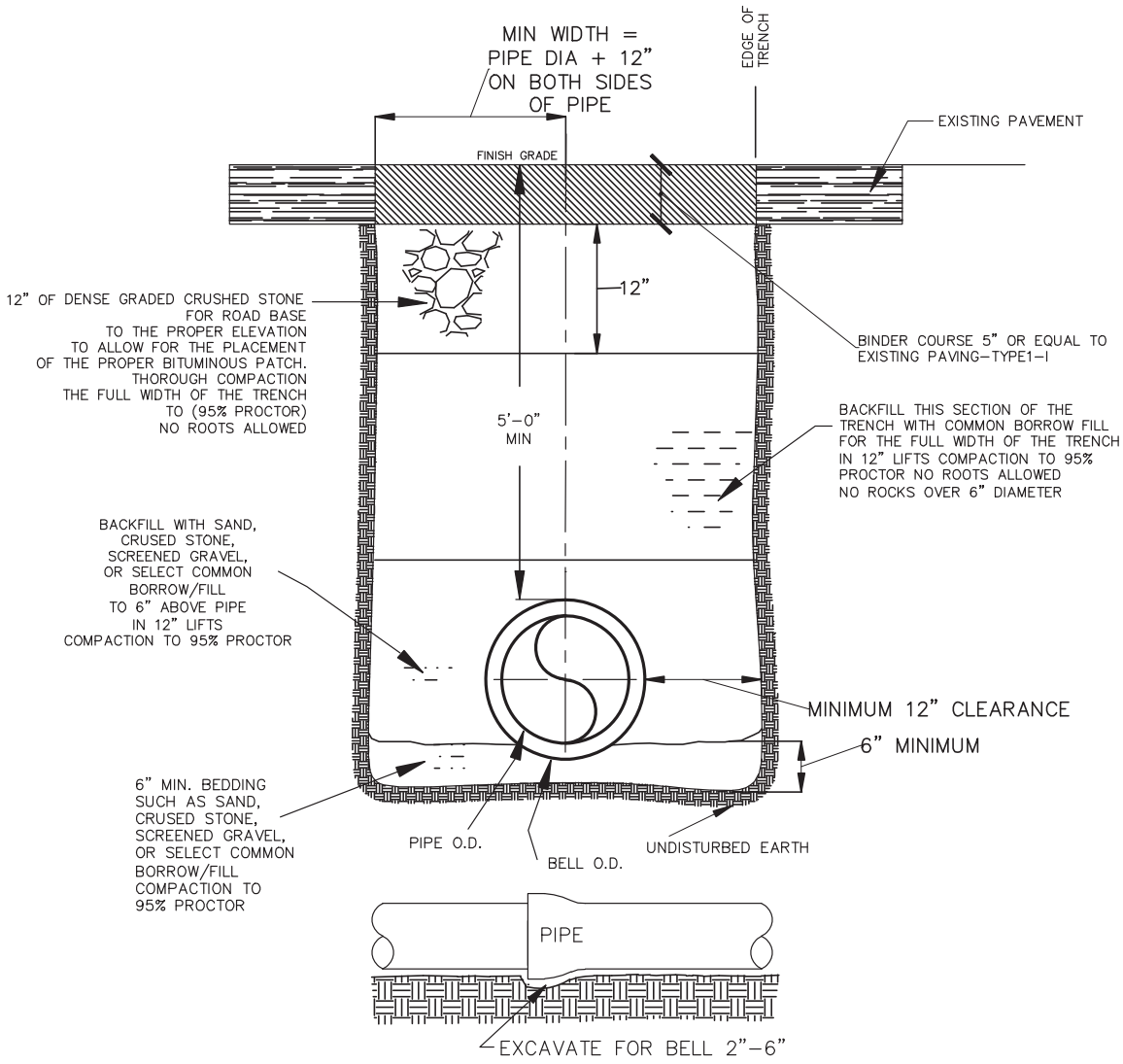
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.4

TRENCH BACKFILLING-METHOD FOR RESIDENTIAL STREETS IN SPRINGFIELD

SCALE: NTS

REV. DATE
4/1/08 MAB
6/18/08 MAB



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

EXISTING PAVEMENT
EXCAVATED AND REPLACED WITH BINDER COURSE
DENSE GRADED CRUSHED STONE
COMMON BORROW
BEDDING SAND
UNDISTURBED EARTH

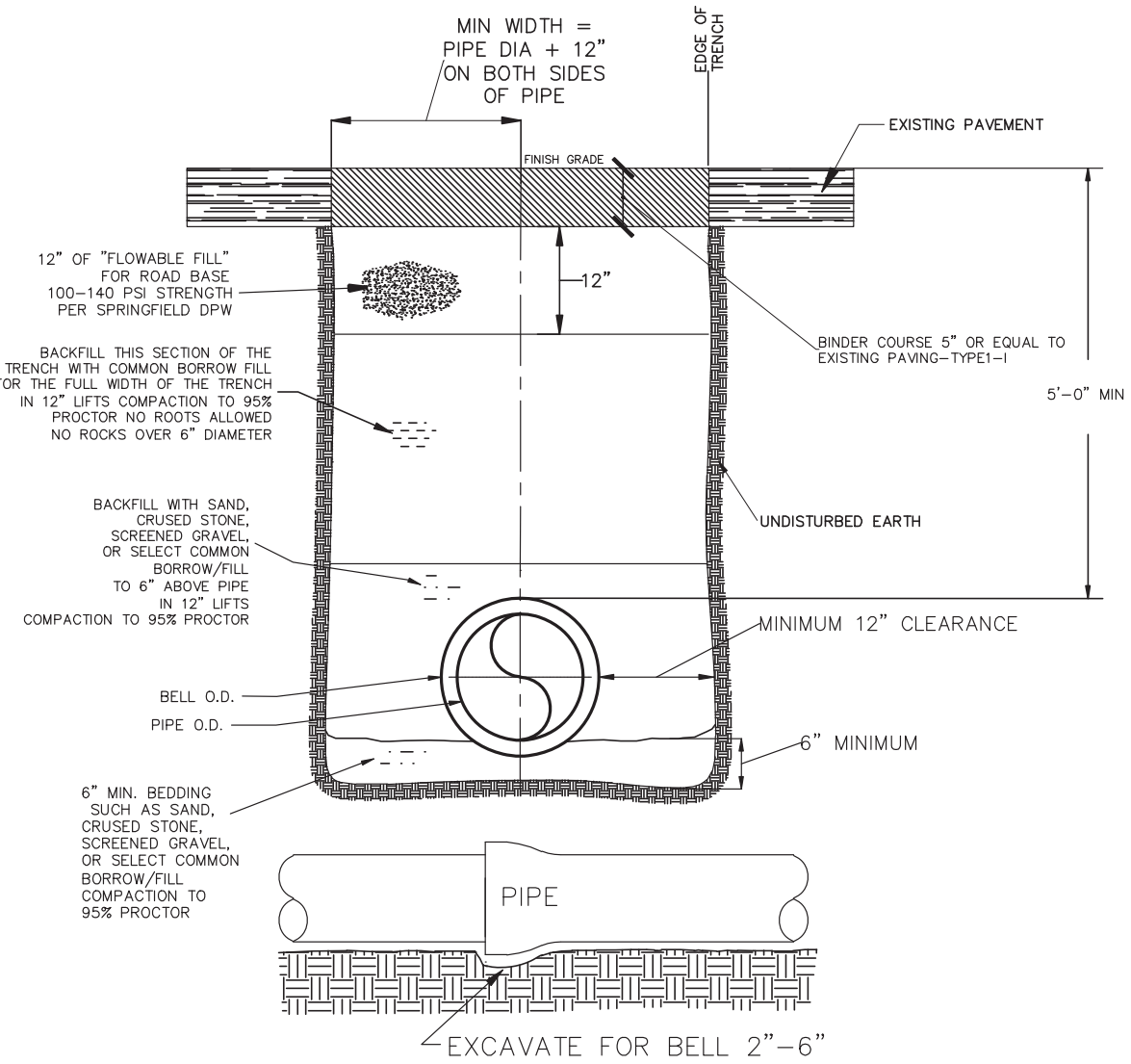
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.5

TEMPORARY TRENCH BACKFILLING-METHOD FOR ALL STREETS IN SPRINFIELD & LUDLOW ACCEPT SPRINFIELD ARTERIALS

SCALE: NTS

REV. DATE
6/18/08 MAB



NOTES:
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3. TO FINISH GRADE.
4. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W–01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON–PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5–INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12–INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6–INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

EXISTING PAVEMENT
EXCAVATED AND REPLACED WITH BINDER COURSE
BEDDING SAND
FLOWABLE FILL
UNDISTURBED EARTH
COMMON BORROW

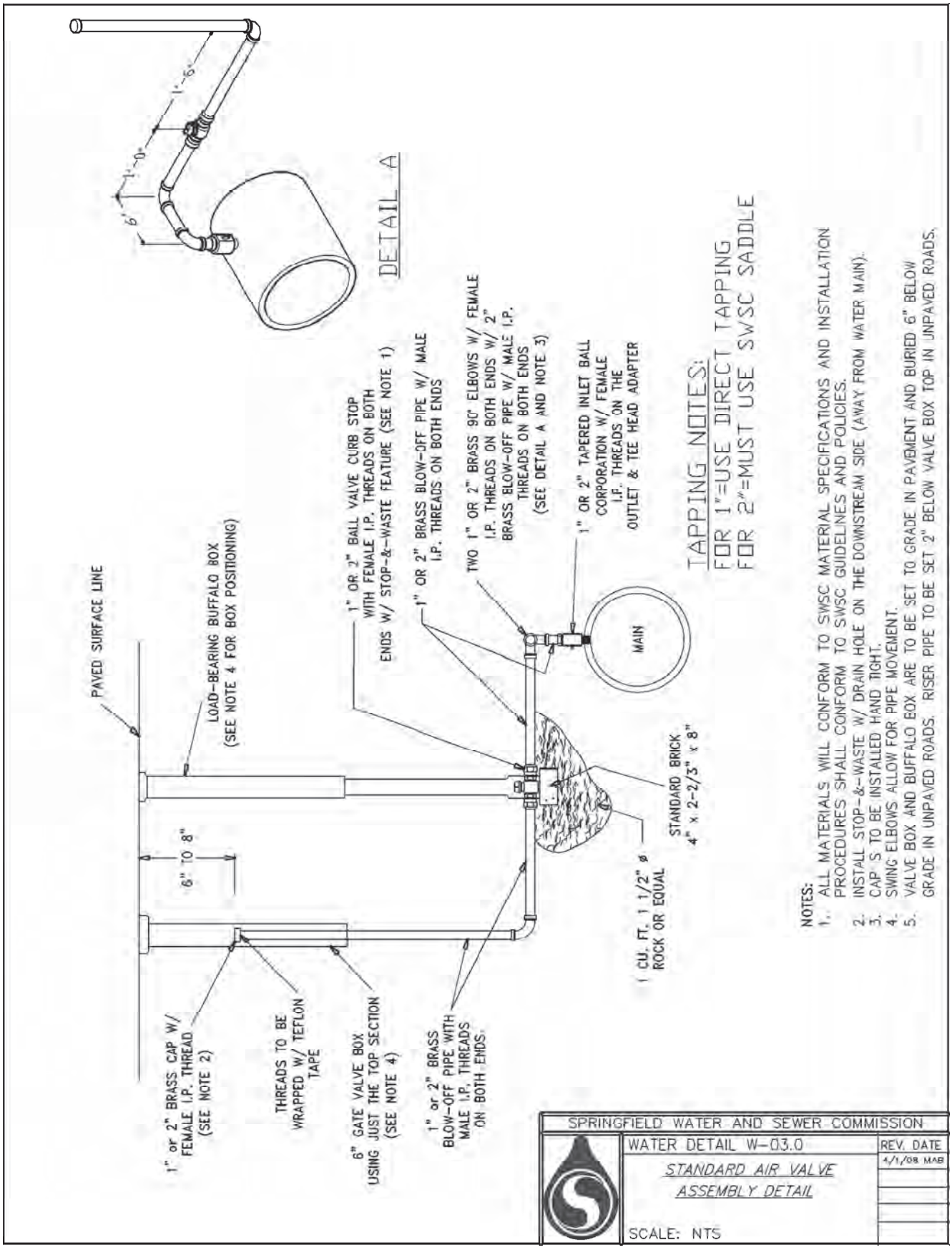
SPRINGFIELD WATER AND SEWER COMMISSION

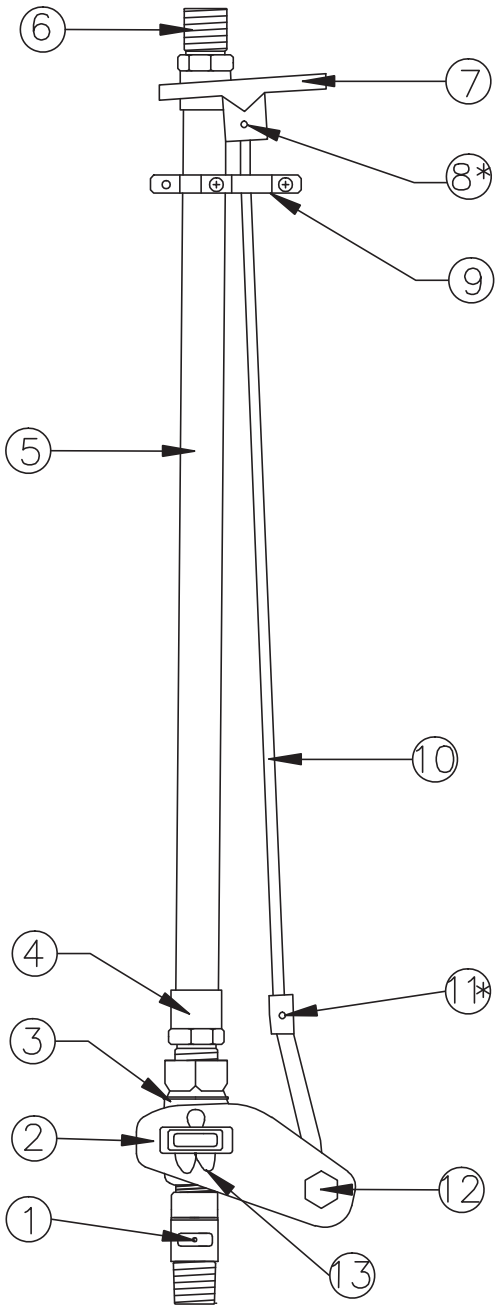
WATER DETAIL W–02.6

TEMPORARY TRENCH BACKFILLING–METHOD FOR ALL ARTERIAL STREETS IN SPRINGFIELD

SCALE: NTS

REV. DATE
6/18/08 MAB


DETAIL A
6'
1'-0"
1'-6"
PAVED SURFACE LINE
LOAD-BEARING BUFFALO BOX
(SEE NOTE 4 FOR BOX POSITIONING)
1" OR 2" BALL VALVE CURB STOP
WITH FEMALE I.P. THREADS ON BOTH
ENDS W/ STOP-&-WASTE FEATURE (SEE NOTE 1)
1" OR 2" BRASS BLOW-OFF PIPE W/ MALE
I.P. THREADS ON BOTH ENDS
TWO 1" OR 2" BRASS 90° ELBOWS W/ FEMALE
I.P. THREADS ON BOTH ENDS W/ 2"
BRASS BLOW-OFF PIPE W/ MALE I.P.
THREADS ON BOTH ENDS
(SEE DETAIL A AND NOTE 3)
1" OR 2" TAPERED INLET BALL
CORPORATION W/ FEMALE
I.P. THREADS ON THE
OUTLET & TEE HEAD ADAPTER
MAIN
STANDARD BRICK
4" x 2-2/3" x 8"
1 CU. FT. 1 1/2" ø
ROCK OR EQUAL
6" TO 8"
1" or 2" BRASS CAP W/
FEMALE I.P. THREAD
(SEE NOTE 2)
THREADS TO BE
WRAPPED W/ TEFLON
TAPE
6" GATE VALVE BOX
USING JUST THE TOP SECTION
(SEE NOTE 4)
1" or 2" BRASS
BLOW-OFF PIPE WITH
MALE I.P. THREADS
ON BOTH ENDS.
TAPPING NOTES:
FOR 1"=USE DIRECT TAPPING
FOR 2"=MUST USE SWSC SADDLE
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. INSTALL STOP-&-WASTE W/ DRAIN HOLE ON THE DOWNSTREAM SIDE (AWAY FROM WATER MAIN).
3. CAP IS TO BE INSTALLED HAND TIGHT.
4. SWING ELBOWS ALLOW FOR PIPE MOVEMENT.
5. VALVE BOX AND BUFFALO BOX ARE TO BE SET TO GRADE IN PAVEMENT AND BURIED 6" BELOW GRADE IN UNPAVED ROADS. RISER PIPE TO BE SET 2" BELOW VALVE BOX TOP IN UNPAVED ROADS.
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-03.0
STANDARD AIR VALVE
ASSEMBLY DETAIL
SCALE: NTS
REV. DATE
4/1/08 MAB



NO.	DESCRIPTION
1	BALL TYPE COPORATION: USE (Mueller B25008) OR APPROVED EQUAL. AWWA/CC X Male Iron Pipe (IP) Threads
2	LOWER OPERATING LEVER: Cast or Stamped Brass to Spec.
3	BALL TYPE CURB STOP: FOR 1" AIR VALVE: USE (FORD B11-444SW) OR APPROVED EQUAL. FOR 2" AIR VALVE: USE (FORD B11-777SW) OR APPROVED EQUAL. Female Iron Pipe (IP) Threads Both Ends and Stop and Waste on the Riser Side of Stop.
4	LOWER MALE ADAPTER: Copper (Domestic)
5	RISER: Copper Type L (Domestic)
6	UPPER MALE ADAPTER: Copper (Domestic)
7	T-HANDLE: Cast Brass
8*	OPERATING ROD T-HANDLE SECUREMENT: Stainless Steel Roll Pin
9	ROD TO RISER CONNECTION: Split Ring (By Size of Riser), Attached to ½" Split Ring by Coated ⅜"-16 x 1 ¼" Set Screw and Stainless Steal ⅜" Spacer Nut
10	OPERATING ROD: Brass Round (CDA 360, ASTM B-16)
11*	LOWER MECHANISM SECUREMENT: Stainless Steel Roll Pin
12	3/8" x 1/2" STAINLESS STEEL BOLT: With Nylock Safety Nut
13	LOWER LEVEL TO VALVE COTTER PIN: Marine Type Brass

NOTE:
* - VISUALLY OBSTRUCTED

*USE OF THIS DEVICE REQUIRES APPROVAL BY THE SWSC PRIOR TO INSTALLATION

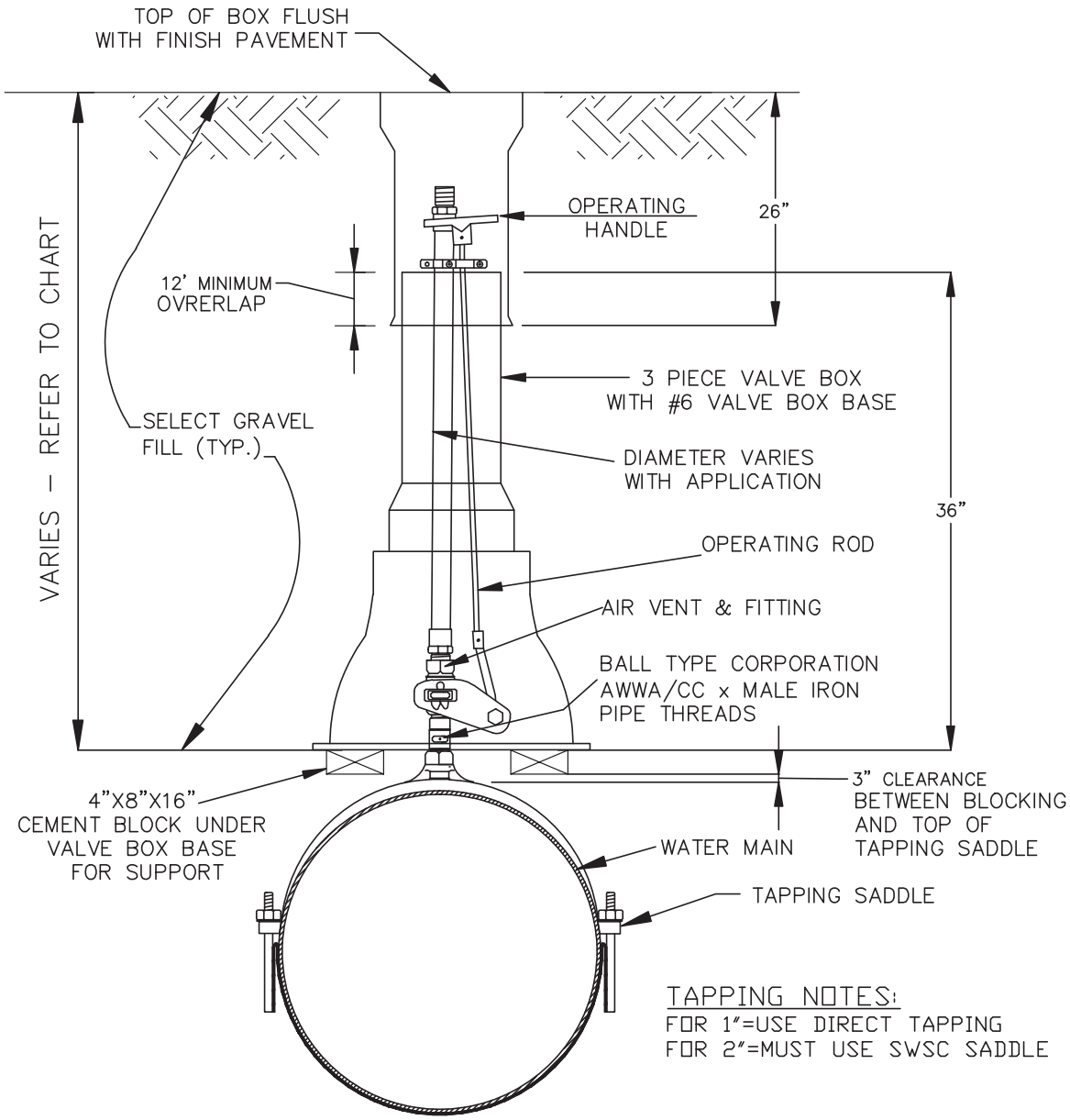
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-03.1

AIR VALVE
ONE PIECE ASSEMBLY DETAIL

SCALE: NTS

REV. DATE
4/1/08 MAB



TAPPING NOTES:
FOR 1"=USE DIRECT TAPPING
FOR 2"=MUST USE SWSC SADDLE

VALVE DIAMETER	PIPE LENGTH	REQUIRED COVER
1"	30"	4.0'
1"	36"	4.5'
1"	42"	5.0'
2"	30"	4.0'
2"	36"	4.5'
2"	42"	5.0'
CUSTOM	*CUSTOM*	*AS REQUIRED BY ENGINEER*

*USE OF THIS DEVICE REQUIRES APPROVAL BY THE SWSC PRIOR TO INSTALLATION

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND OLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.

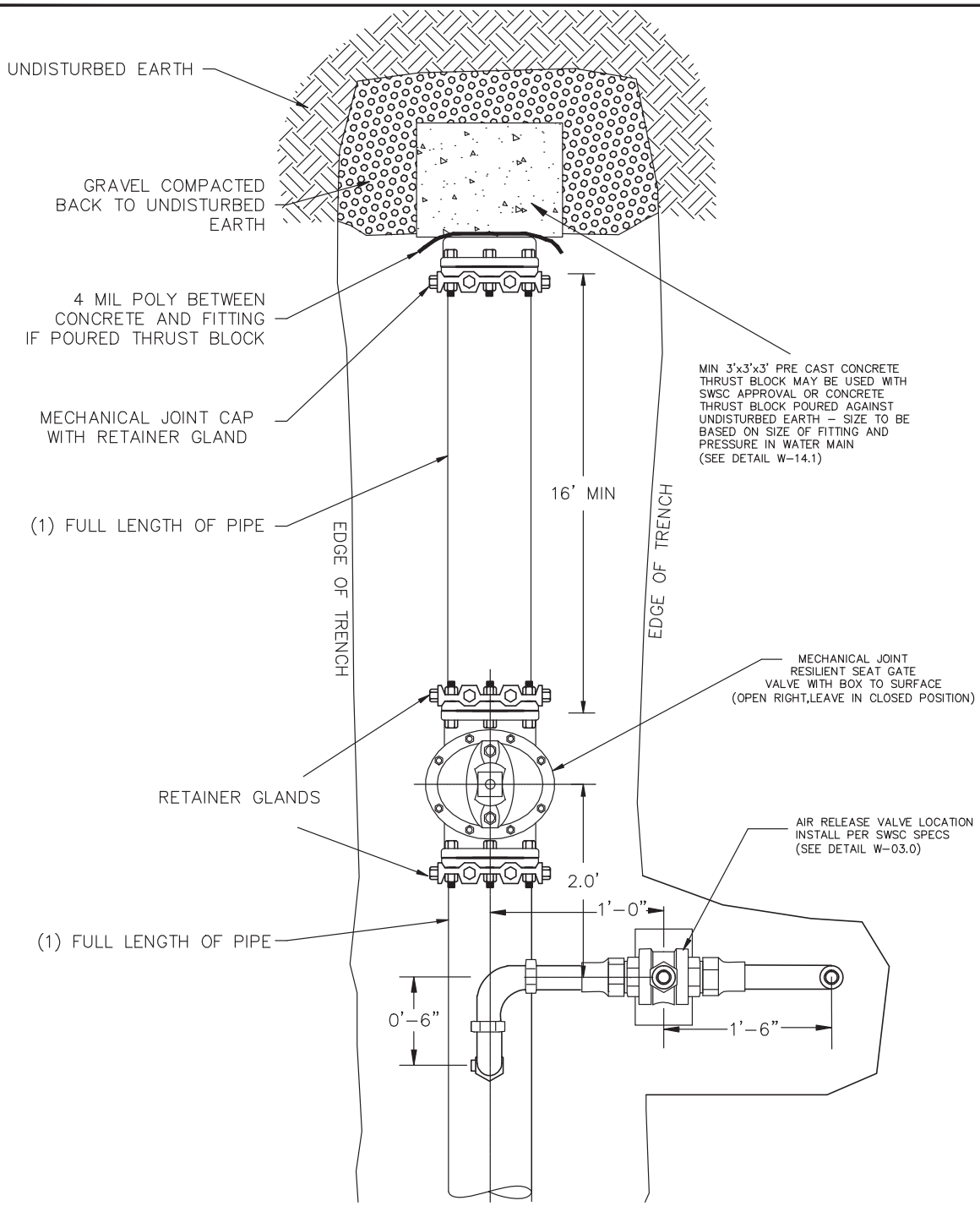
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W–03.2

AIR VALVE
ONE PIECE ASSEMBLY DETAIL

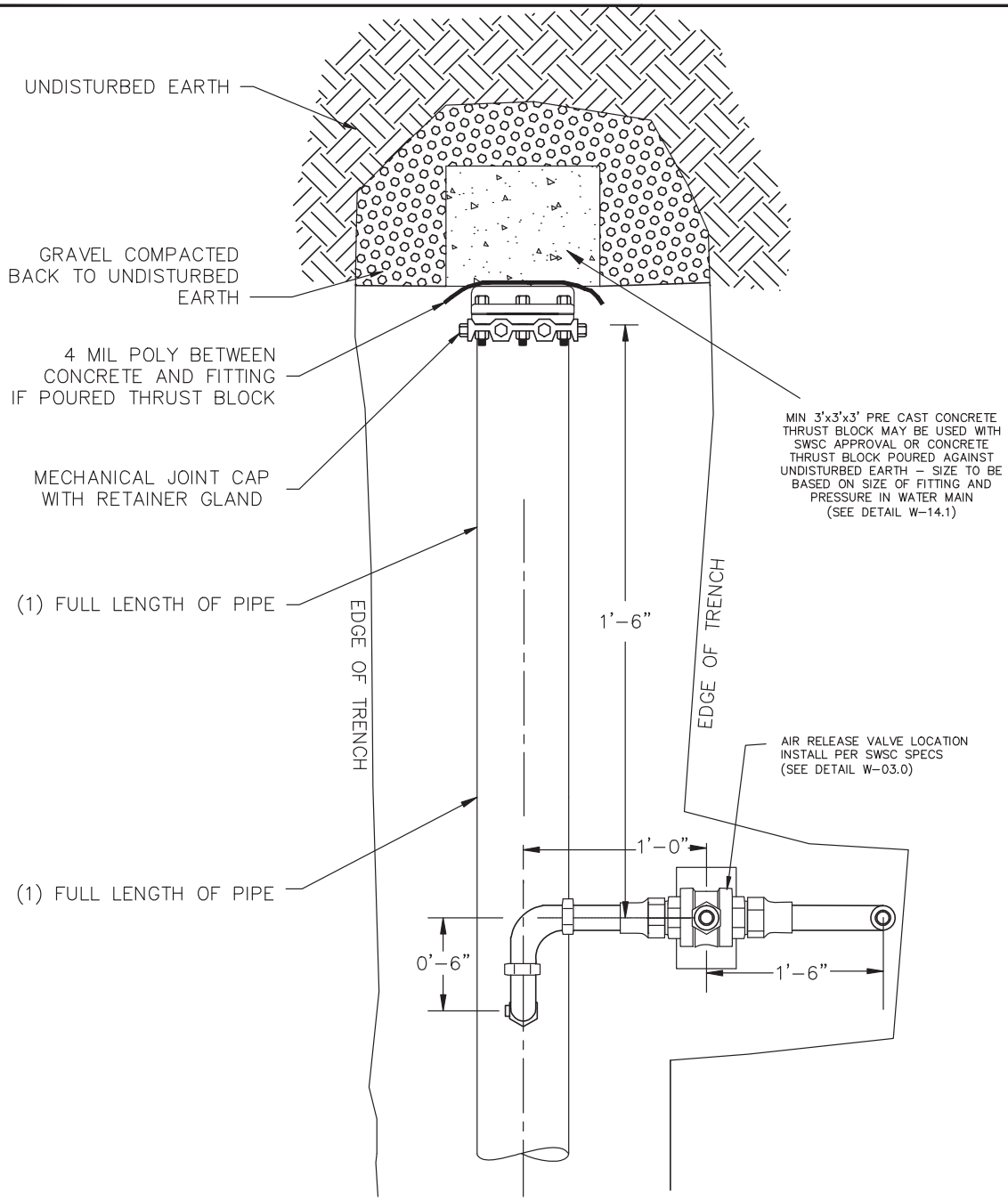
SCALE: NTS

REV. DATE
4/1/08 MAB



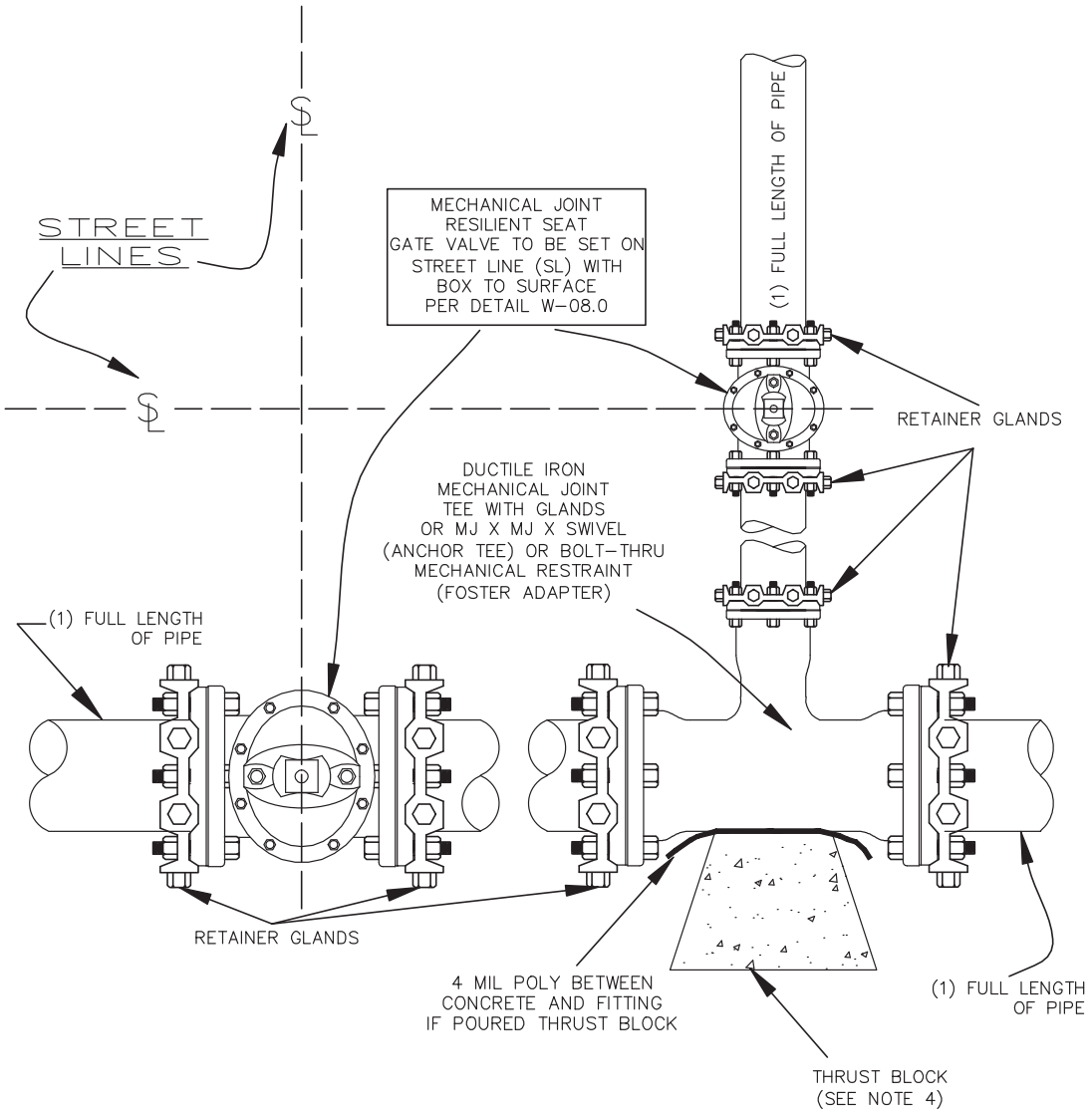
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–04.0	REV. DATE 4/1/08 MAB
	END OF MAIN	
	SCALE: NTS	



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.

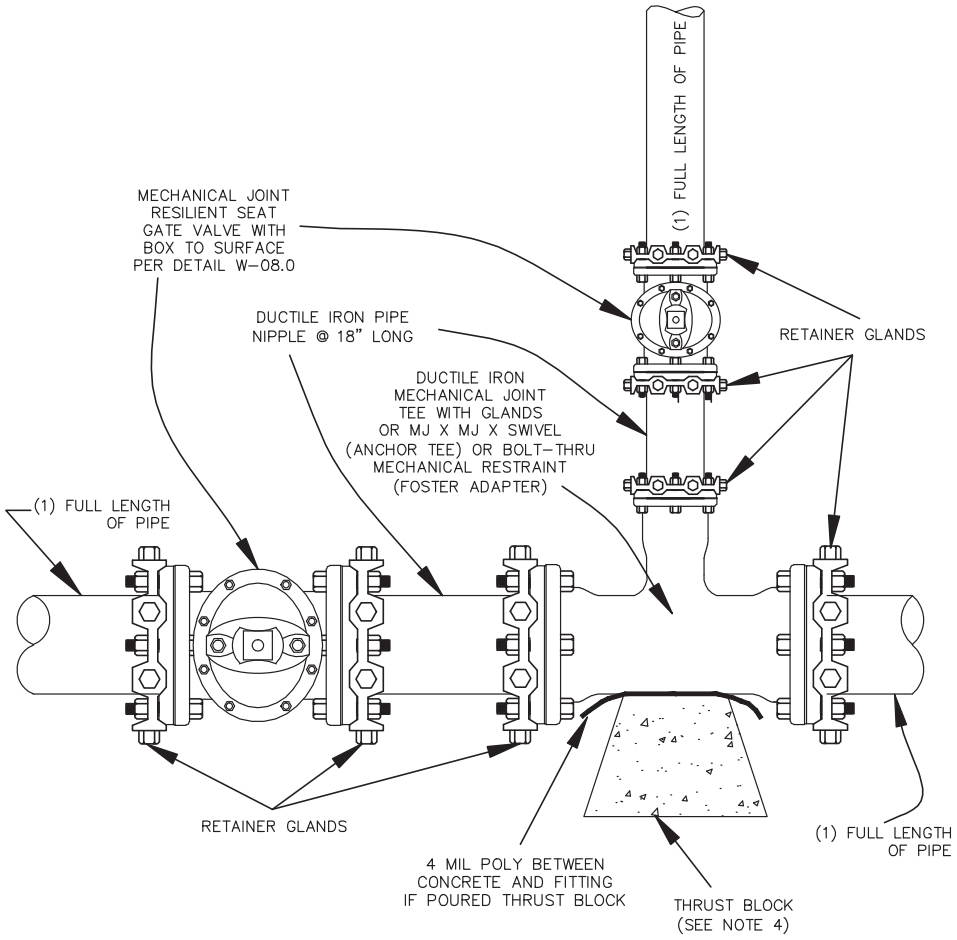
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–04.1	REV. DATE
	END OF MAIN DETAIL	4/1/08 MAB
	SCALE: NTS	



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.
4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH SWSC APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH – SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN SEE DETAIL (W–14.1).
5. THE MECHANICAL JOINTS OF THE PIPES BETWEEN THE VALVES AND THE FITTINGS SHALL BE RESTRAINED VIA RETAINER GLANDS. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS. (SEE DETAIL ABOVE).
6. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W–06.1 THRU W–06.6).

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–05.0	REV. DATE
		4/1/08 MAB
	STANDARD TEE INSTALLATION	
	SCALE: NTS	



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH SWSC APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH – SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN SEE DETAIL (W-14.1).
5. THE MECHANICAL JOINTS OF THE PIPES BETWEEN THE VALVES AND THE FITTINGS SHALL BE RESTRAINED VIA RETAINER GLANDS. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS. (SEE DETAIL ABOVE).
6. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

THIS DETAIL MUST BE APPROVED FOR USE BY THE S.W.S.C BEFORE IT CAN BE INSTALLED

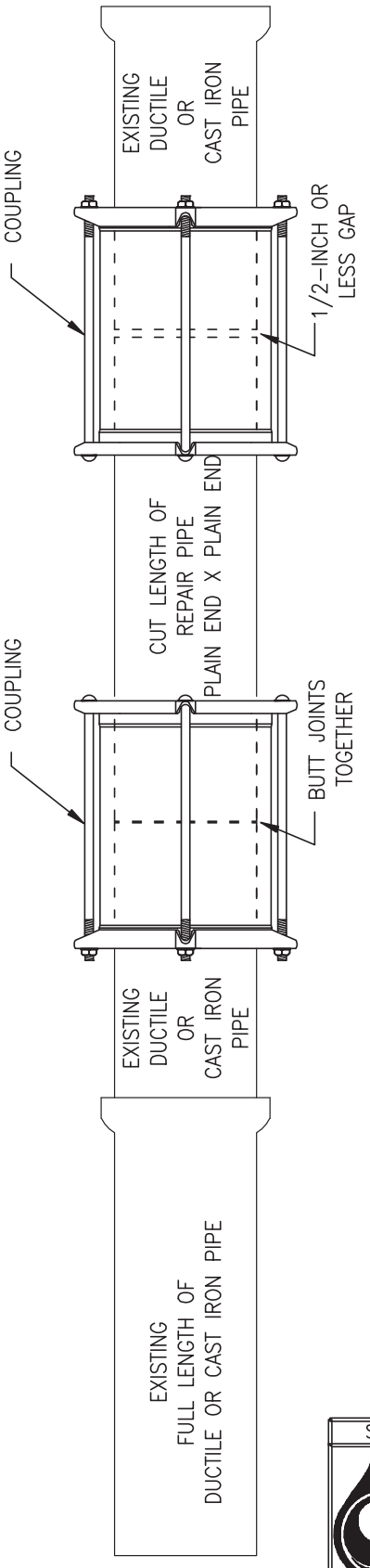
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-05.1

ALTERNATE 1
TEE INSTALLATION

SCALE: NTS

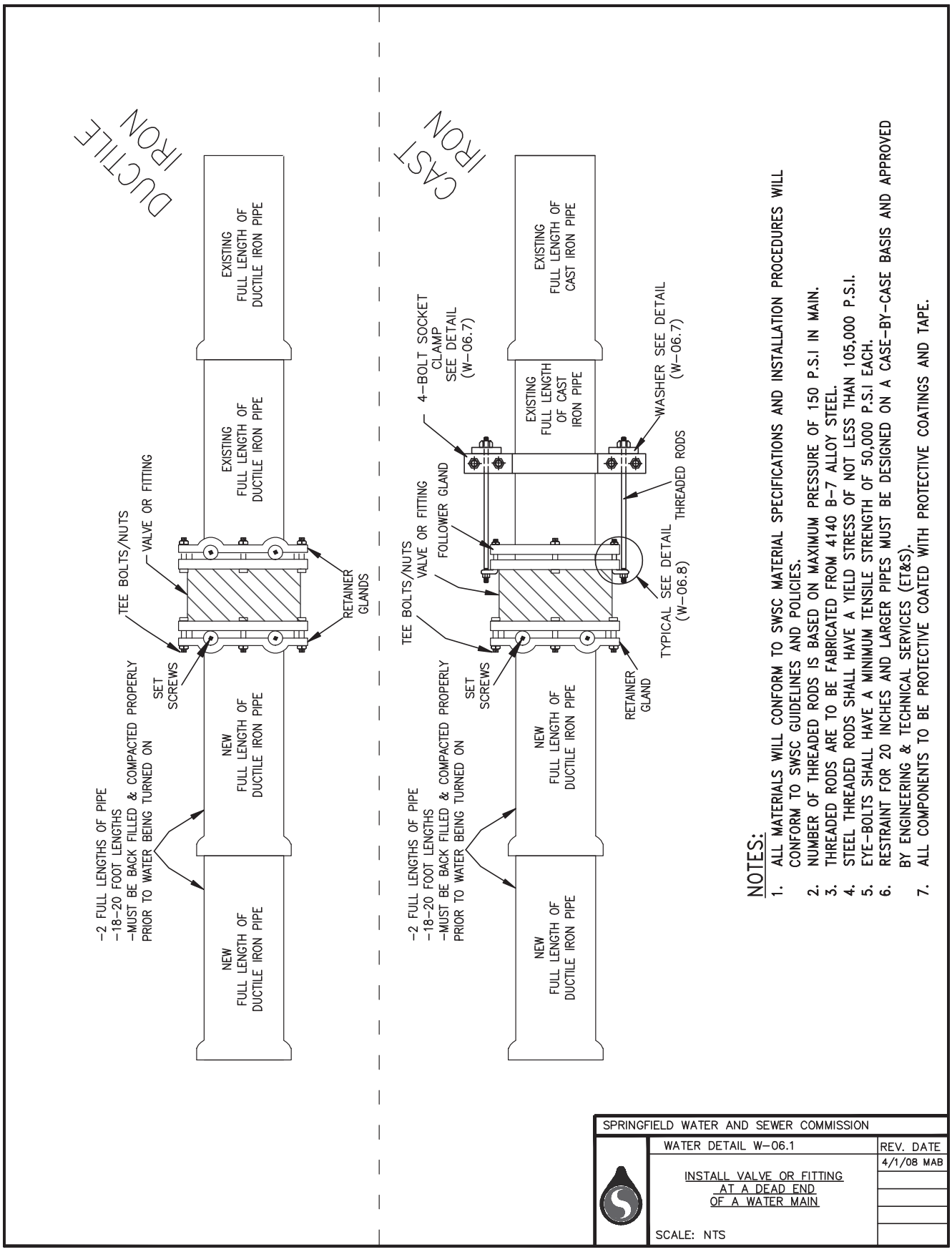
REV. DATE
4/1/08 MAB



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. THESE METHODS SHALL BE USED UNLESS OTHERWISE APPROVED BY ENGINEERING AND TECHNICAL SERVICES DEPARTMENT.
5. WHEN REPAIRING NEAR A VALVE OR A FITTING USE AN APPROVED METHOD OR CALL ENGINEERING AND TECHNICAL SERVICES (ET&S).

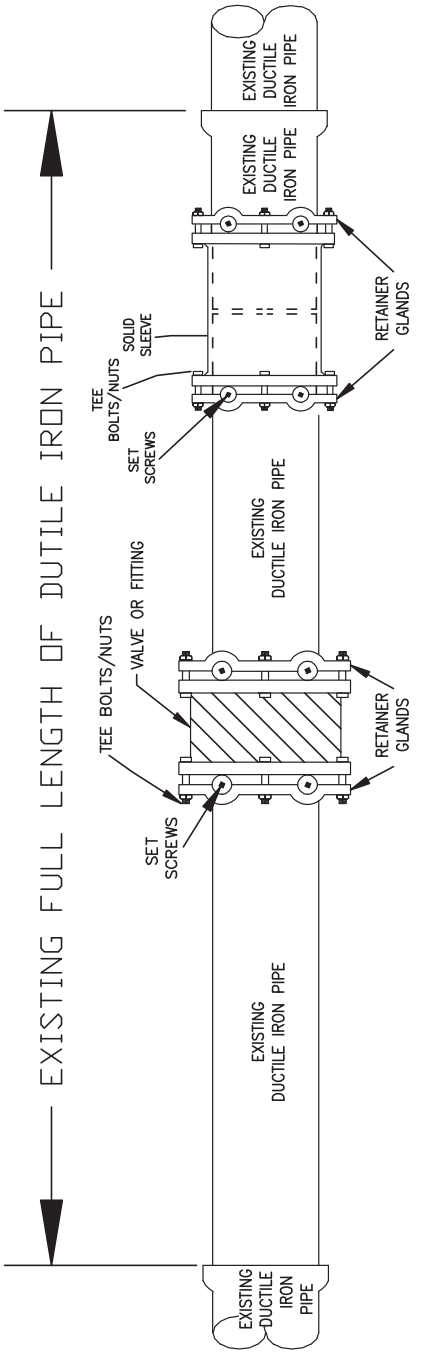
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.0	REV. DATE
		4/1/08 MAB
	REPAIR TO EXISTING WATER MAINS	
	SCALE: NTS	

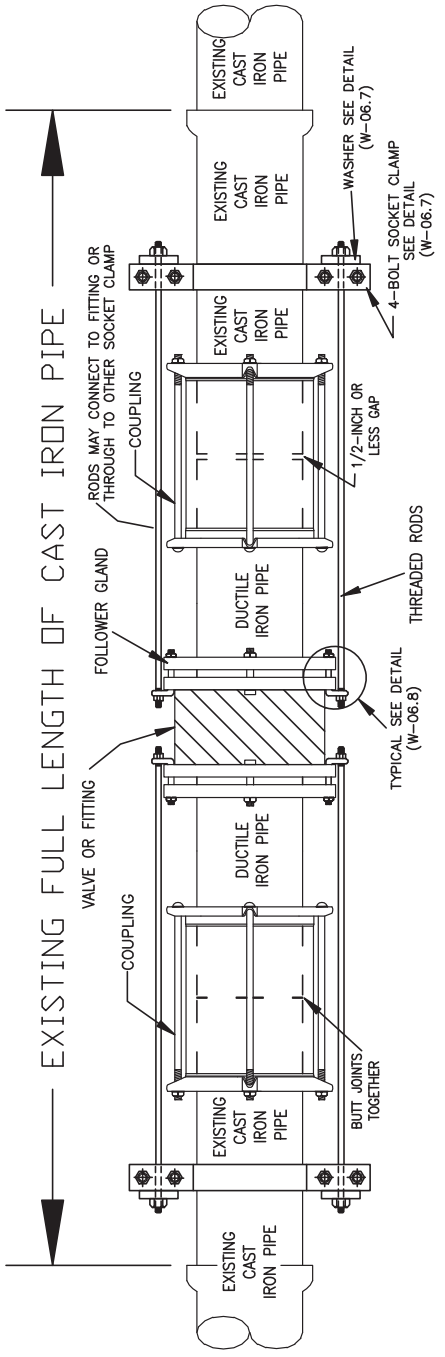


NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.1	REV. DATE
	INSTALL VALVE OR FITTING AT A DEAD END OF A WATER MAIN	4/1/08 MAB
	SCALE: NTS	

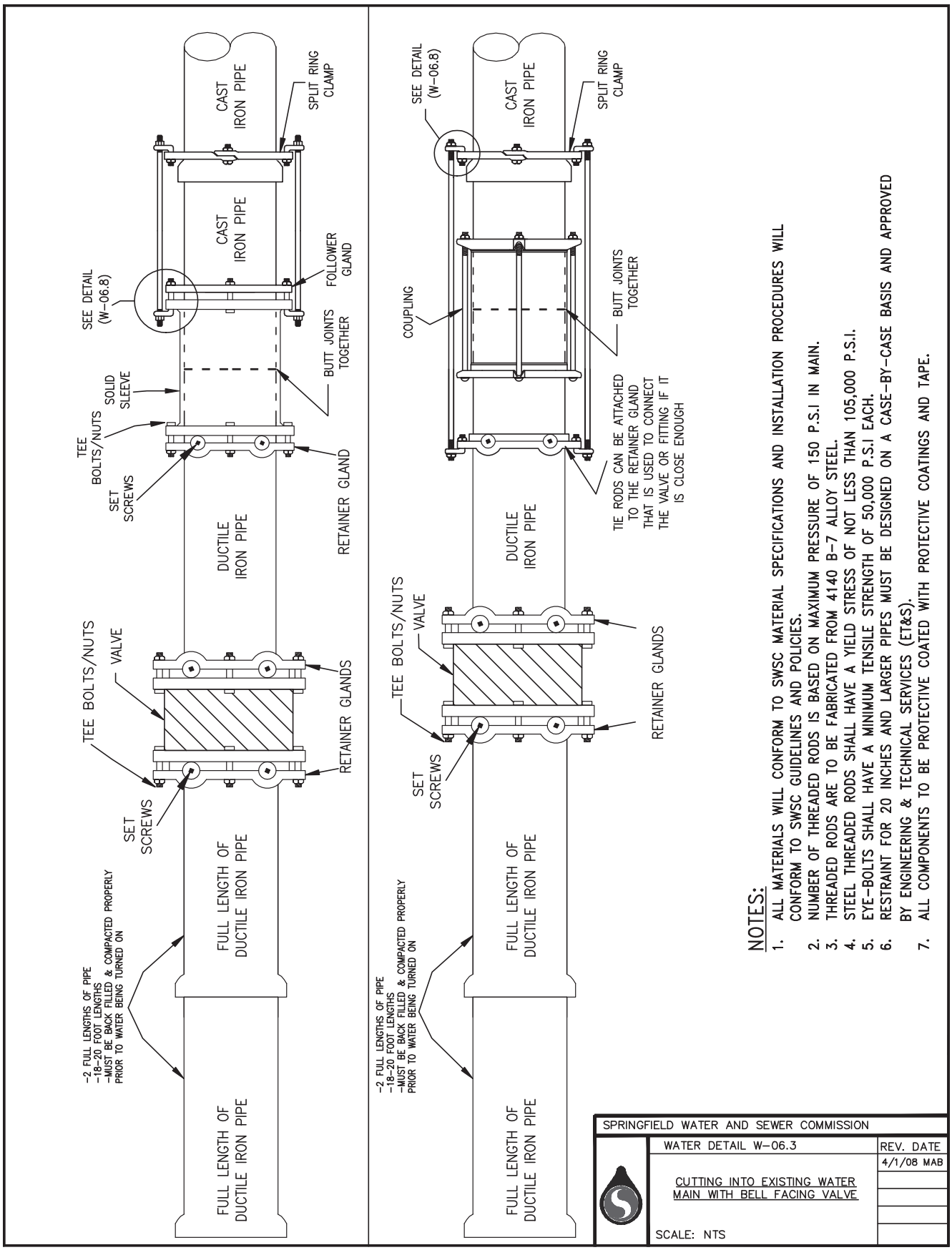


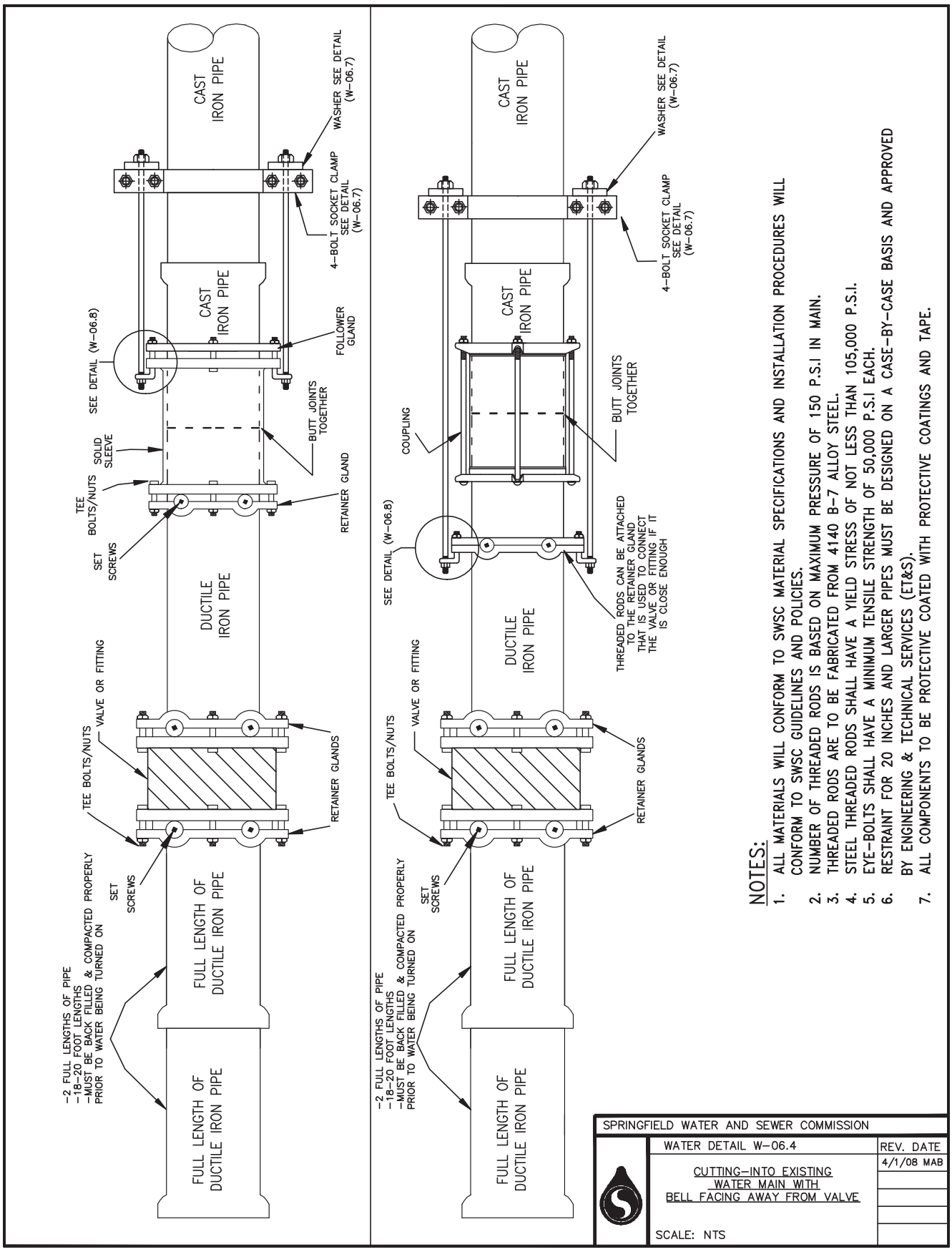


NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.2	REV. DATE
		4/1/08 MAB
	CUTTING-INTO EXISTING WATER MAIN TO REPLACE VALVE OR FITTING	
	SCALE: NTS	


CAST IRON PIPE
SPLIT RING CLAMP
CAST IRON PIPE
SEE DETAIL (W-06.8)
FOLLOWER GLAND
BUTT JOINTS TOGETHER
SOLID SLEEVE
TEE BOLTS/NUTS
SET SCREWS
DUCTILE IRON PIPE
RETAINER GLAND
TEE BOLTS/NUTS
VALVE
RETAINER GLANDS
SET SCREWS
FULL LENGTH OF DUCTILE IRON PIPE
-2 FULL LENGTHS OF PIPE
-18-20 FOOT LENGTHS
-MUST BE BACK FILLED & COMPACTED PROPERLY
PRIOR TO WATER BEING TURNED ON
FULL LENGTH OF DUCTILE IRON PIPE
SEE DETAIL (W-06.8)
CAST IRON PIPE
SPLIT RING CLAMP
COUPLING
BUTT JOINTS TOGETHER
TIE RODS CAN BE ATTACHED TO THE RETAINER GLAND THAT IS USED TO CONNECT THE VALVE OR FITTING IF IT IS CLOSE ENOUGH
DUCTILE IRON PIPE
TEE BOLTS/NUTS
VALVE
RETAINER GLANDS
SET SCREWS
FULL LENGTH OF DUCTILE IRON PIPE
-2 FULL LENGTHS OF PIPE
-18-20 FOOT LENGTHS
-MUST BE BACK FILLED & COMPACTED PROPERLY
PRIOR TO WATER BEING TURNED ON
FULL LENGTH OF DUCTILE IRON PIPE
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-06.3
REV. DATE
4/1/08 MAB
CUTTING INTO EXISTING WATER MAIN WITH BELL FACING VALVE
SCALE: NTS

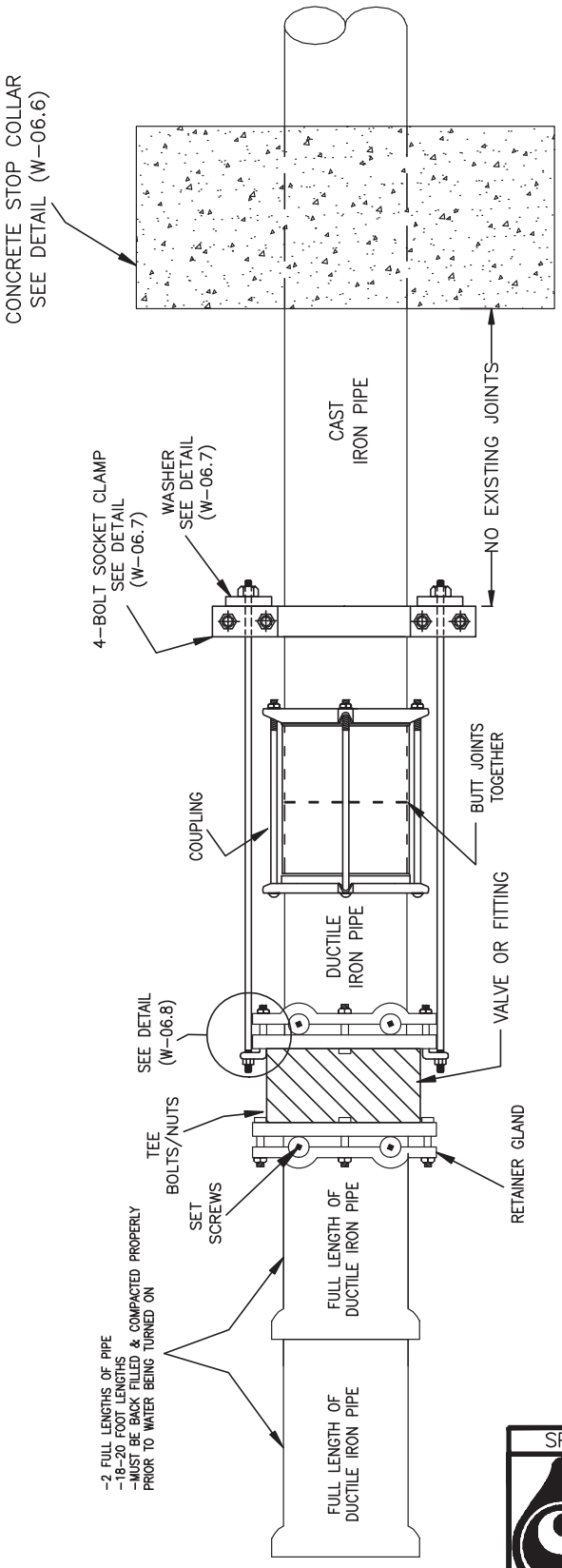


NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-06.4	REV. DATE
CUTTING-INTO EXISTING WATER MAIN WITH BELL FACING AWAY FROM VALVE	4/1/08 MAB
SCALE: NTS	



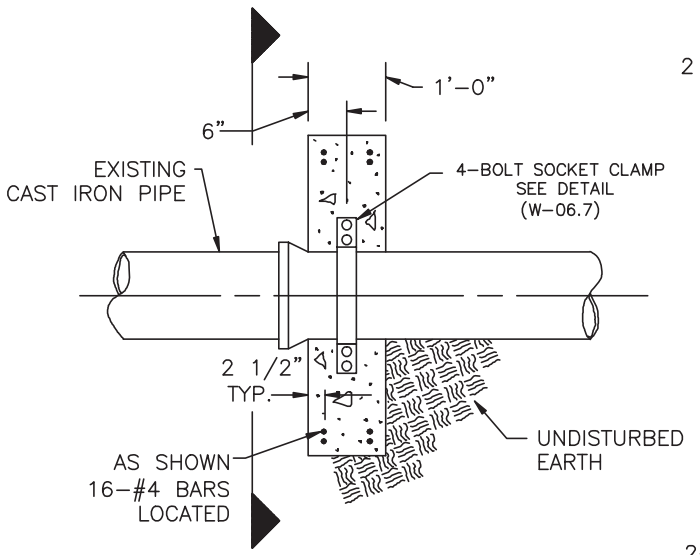
NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

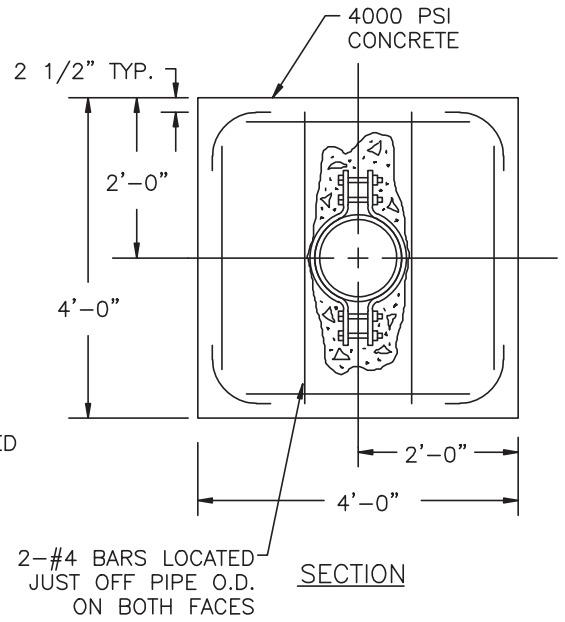
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-06.5	REV. DATE
CUTTING-INTO EXISTING WATER MAIN WITH NO BELL FOUND	4/1/08 MAB
SCALE: NTS	

CONCRETE THRUST COLLAR



PLAN



SECTION

SPECIAL NOTE:

1. IN LIEU OF CONCRETE STOP COLLAR THE CONTRACTOR MAY MECHANICALLY RESTRAIN (BY APPROVED METHOD) THREE (3) FULL PIPE LENGTHS FROM PROPOSED LOCATION OF STOP COLLAR.

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B–7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE–BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE–BY–CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W–06.6

CONCRETE THRUST COLLAR

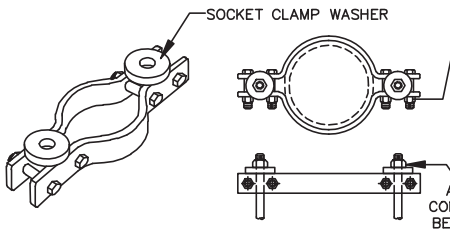
SCALE: NTS

REV. DATE
4/1/08 MAB

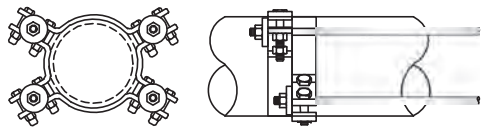
SOCKET CLAMP DATA CHART

Nominal Pipe Size (in inches)	Max Hydrostatic Test Pressure (in PSI)	Force (1) on Clamp (in lbs.)	Clamp (2 & 3) Inside Diameter (in inches)	Length of Clamp (2 & 3) (in inches)	Width of Clamp (2 & 3) (in inches)	Thickness of Clamp (2 & 3) (in inches)	Minimum Bolt Size (in inches)	Thickness of CI Clamp Washer (4) (in inches)	Size of CI Clamp Washer (4) (in inches)	Thickness of Steel Clamp Washer (4) (in inches)	Size of Steel Clamp Washer (4) (in inches)	Nominal Threaded Rod (7) Diameter (in inches)	Number of Nominal Threaded Rod (7)	Associated Hardware
4	250	4550	5	14 5/8	2	1/2	5/8 x 3 1/2	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
6	250	9340	7 1/8	16 7/8	2	1/2	5/8 x 3 1/2	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
8	250	16080	9 5/16	19 1/8	2 1/2	5/8	5/8 x 4	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
10	250	24190	11 1/2	21 3/8	2 1/2	5/8	3/4 x 4	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
12	250	34280	13 1/2	25 1/8	3	5/8	7/8 x 4 1/2	3/4	3-1/2 dia or 3-1/2 x 3-1/2	1/2	3 dia or 3 x 3	1	1	notes 2, 5, 6, 8, & 9
16	115	27760	17 7/8	31 3/8	4	3/4	1 x 4 1/2	1	4 dia or 4 x 4	1/2	3-1/2 dia or 3-1/2 x 3-1/2	1	2	notes 2, 5, 6, 8, & 9

1. At Max Hydrostatic Test Pressure
2. All Socket Clamps and associated hardware shall meet the requirements of National Fire Protection Association 24
3. Socket Clamps shall be as provided by PHD Manufacturing, Inc. Figure 590, Anvil Company, Figure 595, Cooper B-Line, Figure B 3134, Carpenter and Patterson, Figure 158DB, or the equal product of another manufacturer.
4. Socket Clamps Washers shall be as provided by PHD Manufacturing, Inc. Figure 595, Anvil Company, Figure 594, Cooper B-Line, Figure B 3134W, Carpenter and Patterson, Figure 258, or the equal product of another manufacturer.
5. Bent Eye Bolts shall be constructed of high strength low alloy steel, per ASTM A588, grade B, Unified National Coarse (UNC) rolled thread.
6. Bent Eye Bolts shall be as provided by PHD Manufacturing, Inc. - Figure 598B, Star National Products - Figures ¾"SST747 or ¾"SST757, Dresser Piping Specialties, Inc. – Style 442, or the equal product of another manufacturer.
7. Threaded Rods shall be constructed of 4140-alloy steel, per ASTM A193, grade B7, Unified National Coarse (UNC) rolled thread.
8. Washers for bent eye bolts shall be cadmium plated and constructed of case hardened C1006 steel, grade 2, Rockwell hardness B55
9. Heavy hex nuts shall be constructed of medium carbon steel, ASTM A194, grade 2H, and Unified National Coarse (UNC) thread.



TYPICAL SINGLE 4–BOLT SOCKET CLAMP



TYPICAL TWO 4–BOLT SOCKET CLAMP INSTALLATION

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B–7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE–BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE–BY–CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION

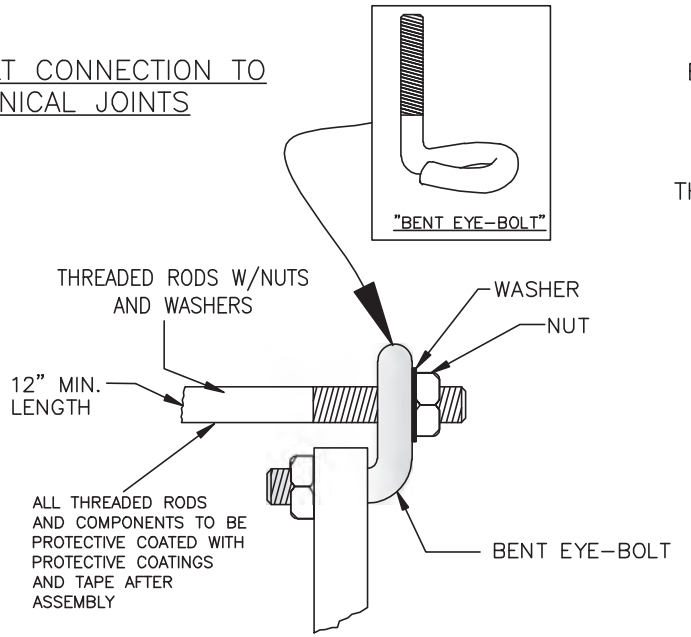
WATER DETAIL W–06.7

SOCKET CLAMP DETAIL

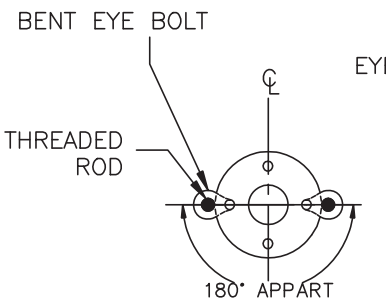
SCALE: NTS

REV.	DATE
	6/18/08 MAB
	4/1/08 MAB

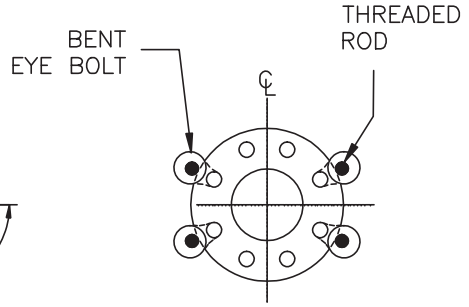
BENT EYE BOLT CONNECTION TO MECHANICAL JOINTS



THRUST RESTRAINT – THREADED ROD



4" THRU 12" JOINTS



16" JOINTS

PIPE SIZE	No. THREADED RODS*
4" THRU 10"	2 – 3/4"ø
12"	2 – 1"ø
16"	4 – 1"ø
GREATER THAN 16"	APPROVAL BY ET&S

*STANDARD LENGTHS ARE 3', 6' & 12'
COUPLINGS MAY BE USED FOR LONGER LENGTHS.

SEE SOCKET CLAMP DATA CHART DETAIL (W–06.7)
FOR HARDWARE, MATERIAL, MANUFACTURERS AND BOLT TIGHTENING REQUIREMENTS

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B–7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE–BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE–BY–CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

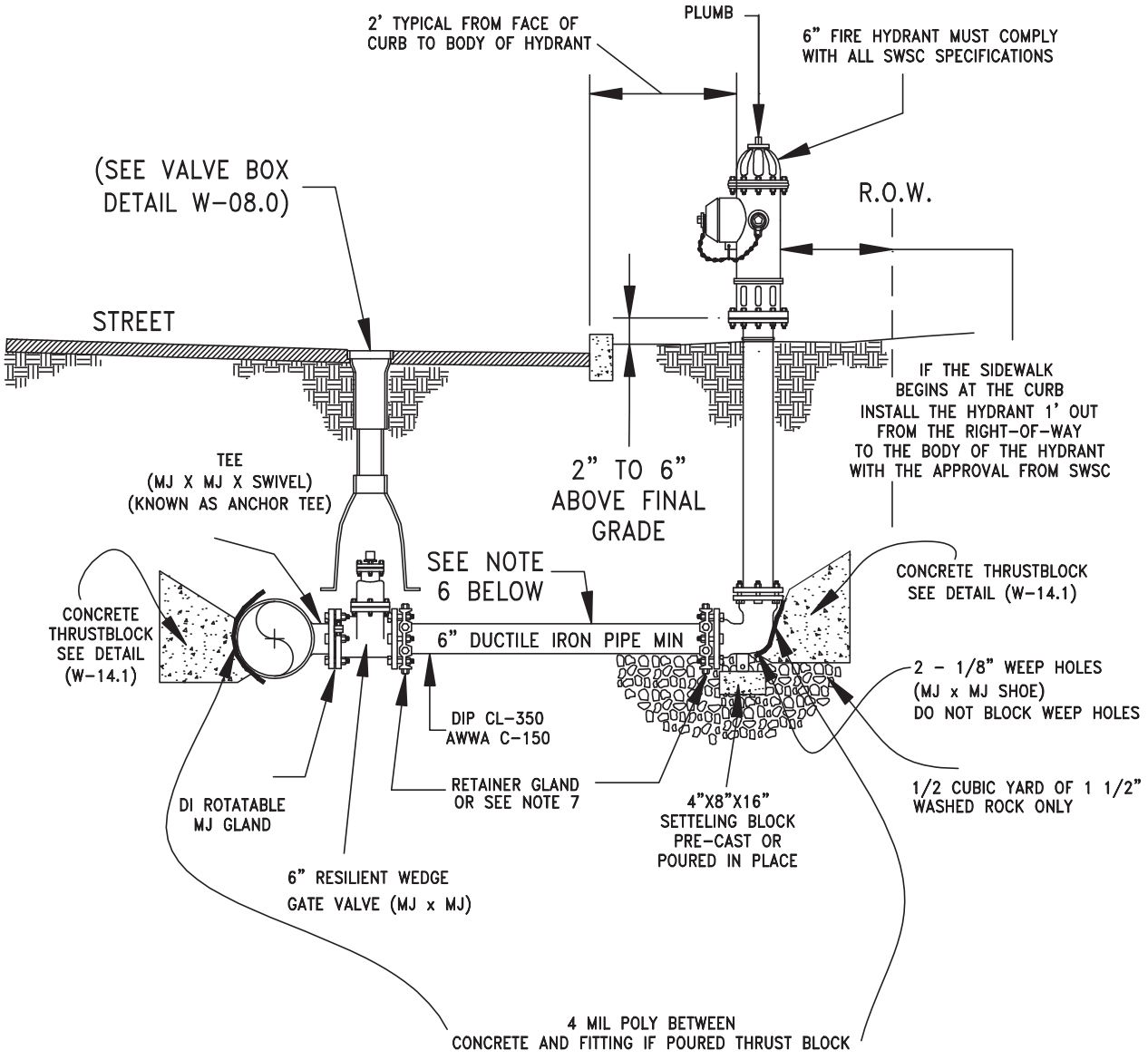
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W–06.8

THREADED ROD DETAIL
CONNECTION TO MJ DETAIL

SCALE: NTS

REV. DATE
4/1/08 MAB



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

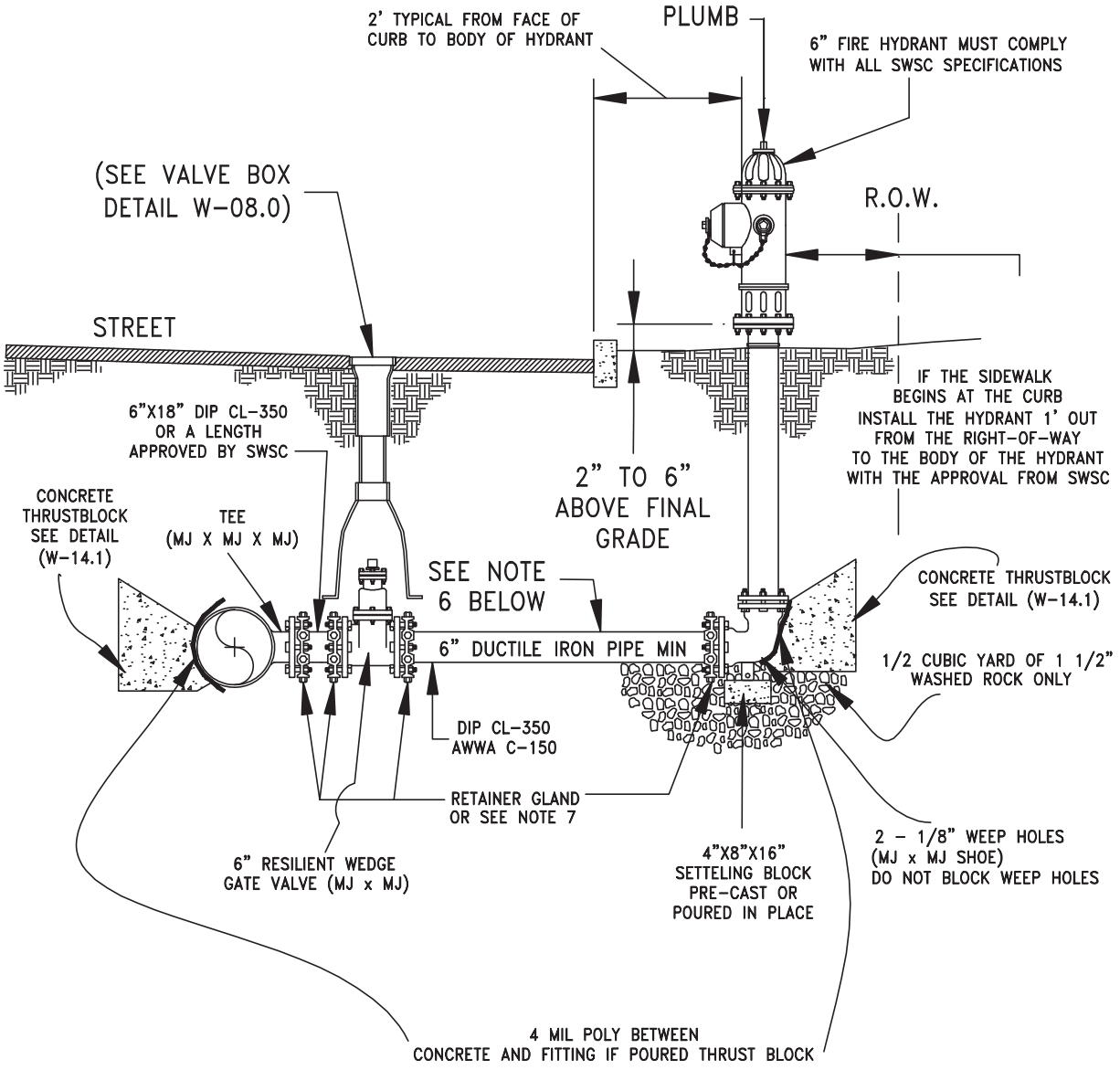
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-07.0

STANDARD FIRE HYDRANT ASSEMBLY

SCALE: NTS

REV. DATE
4/1/08 MAB



THIS DETAIL MUST BE APPROVED FOR USE BY THE S.W.S.C BEFORE IT CAN BE INSTALLED

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

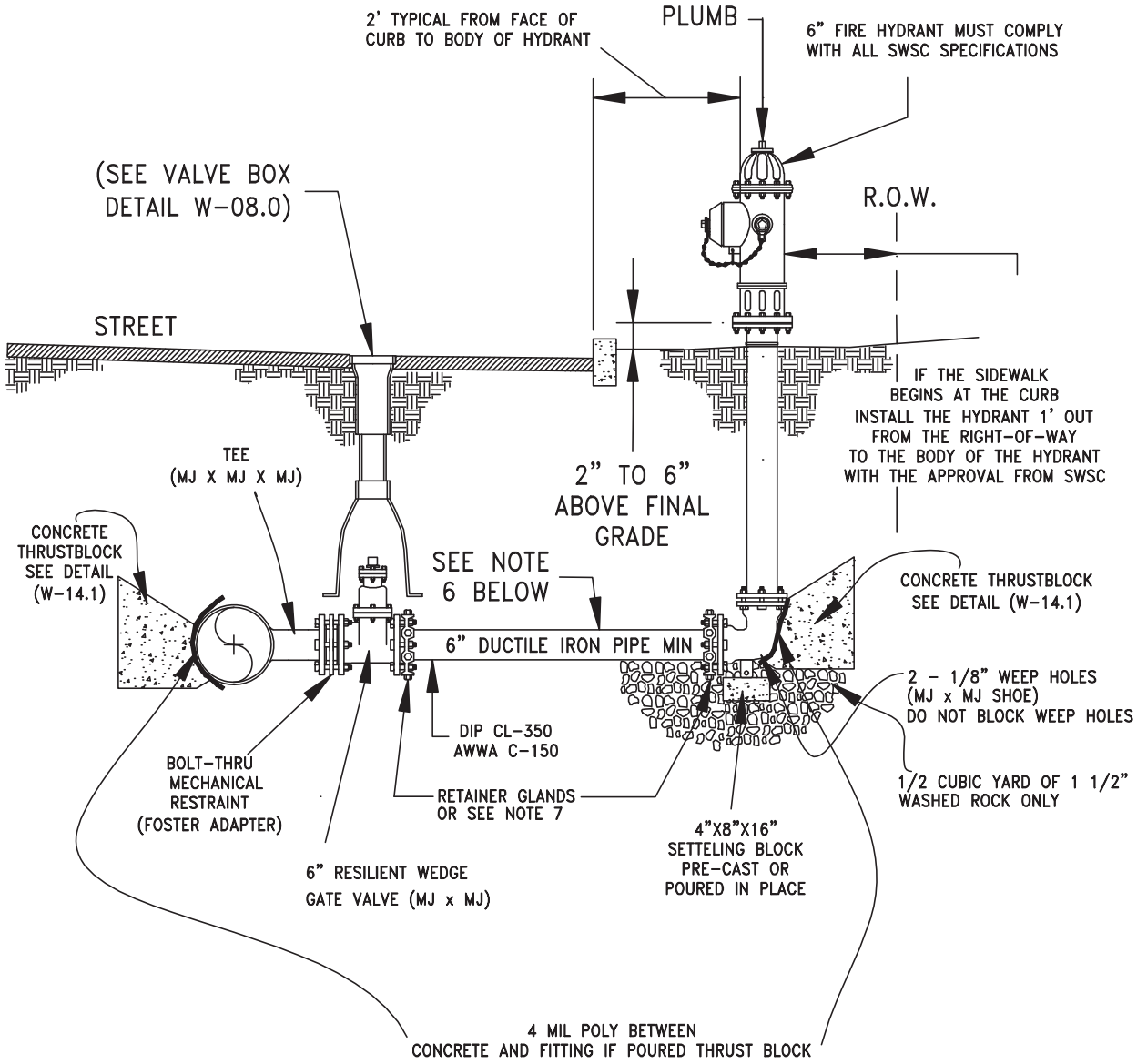
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-07.1

ALTERNATE 1
FIRE HYDRANT ASSEMBLY

SCALE: NTS

REV. DATE
4/1/08 MAB



THIS DETAIL MUST BE APPROVED FOR USE BY THE S.W.S.C BEFORE IT CAN BE INSTALLED

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

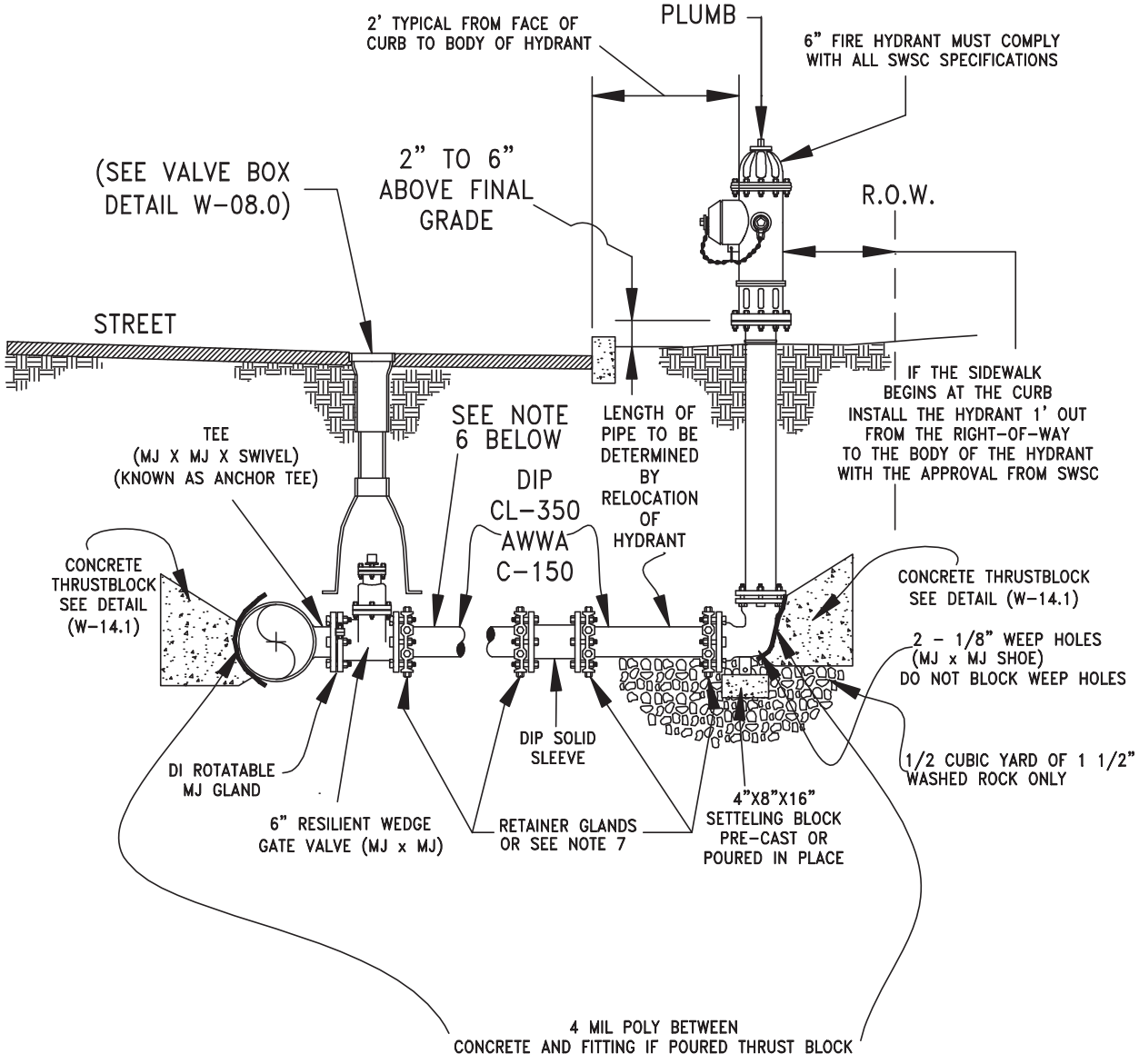
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-07.2

ALTERNATE 2
FIRE HYDRANT ASSEMBLY

SCALE: NTS

REV. DATE
4/1/08 MAB



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

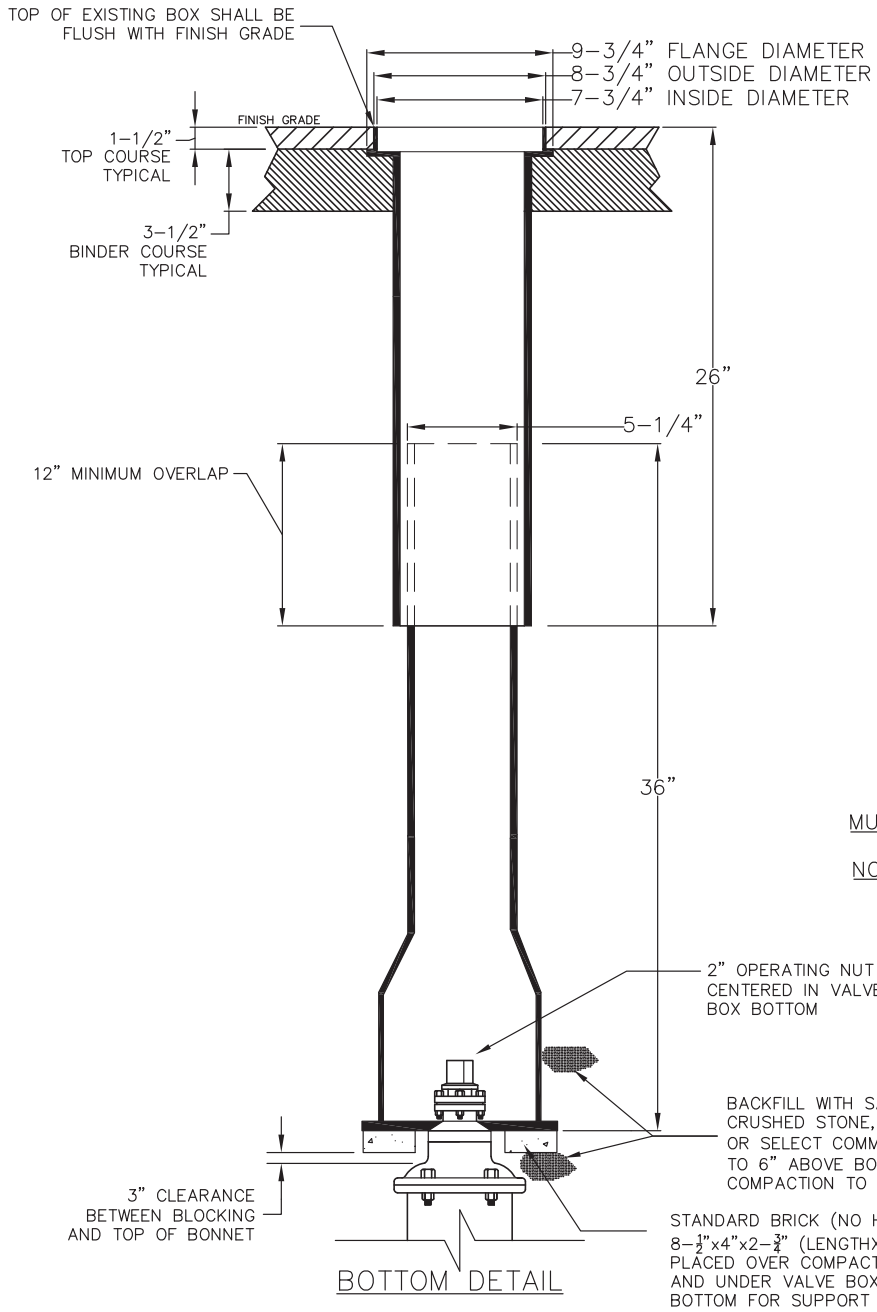
SPRINGFIELD WATER AND SEWER COMMISSION

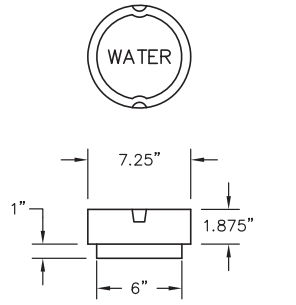
WATER DETAIL W-07.3

RELOCATION OF FIRE HYDRANT ASSEMBLY (STRAIGHT BACK)

SCALE: NTS

REV. DATE
4/1/08 MAB



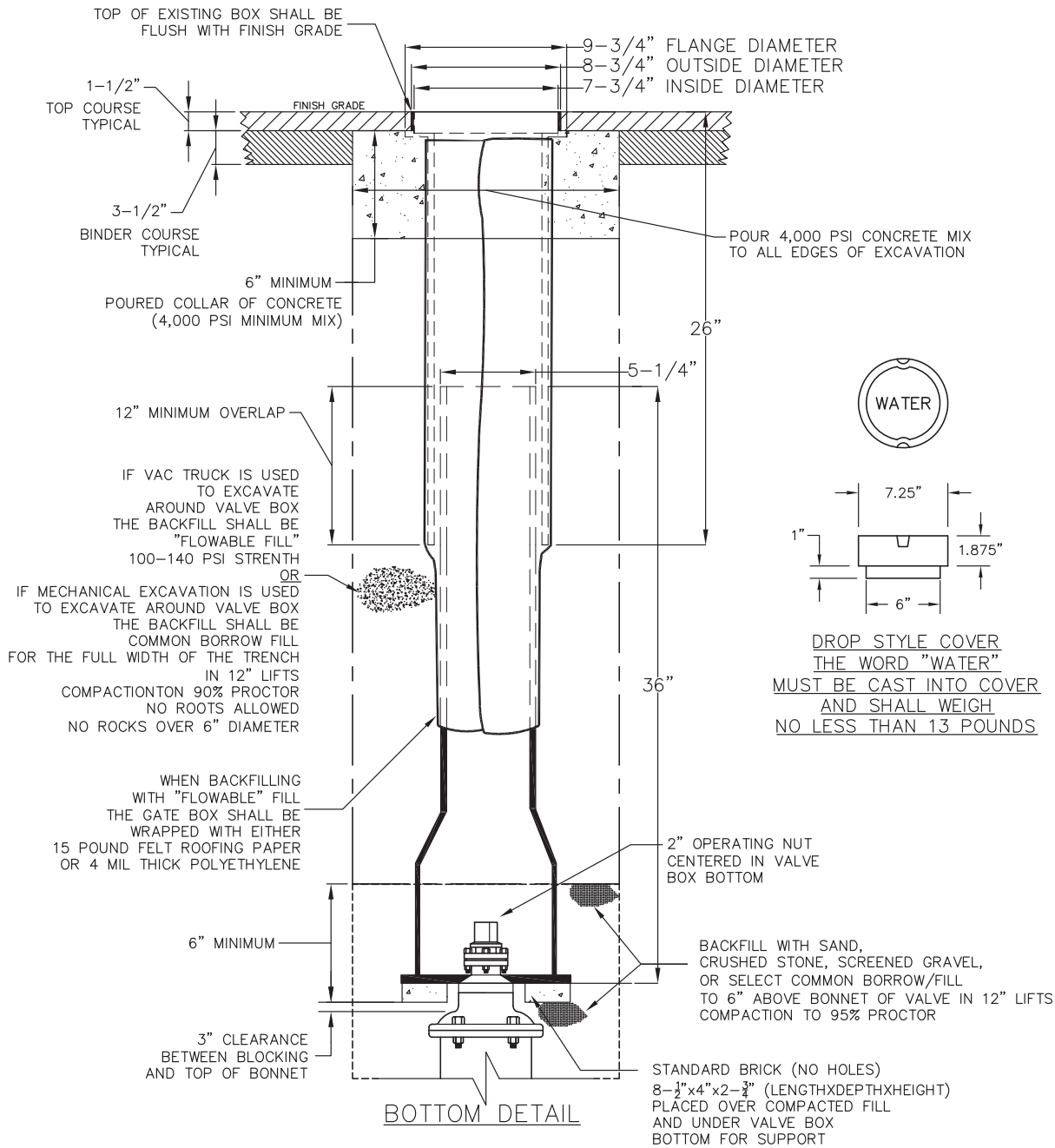


DROP STYLE COVER
THE WORD "WATER"
MUST BE CAST INTO COVER
AND SHALL WEIGH
NO LESS THAN 13 POUNDS

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. IF BACKFILLING WITH "FLOWABLE" FILL WRAP THE VALVE BOX WITH 15 POUND FELT ROOFING PAPER OR 4 MIL THICK POLYETHYLENE IN ACCORDANCE WITH DETAIL W-08.1.

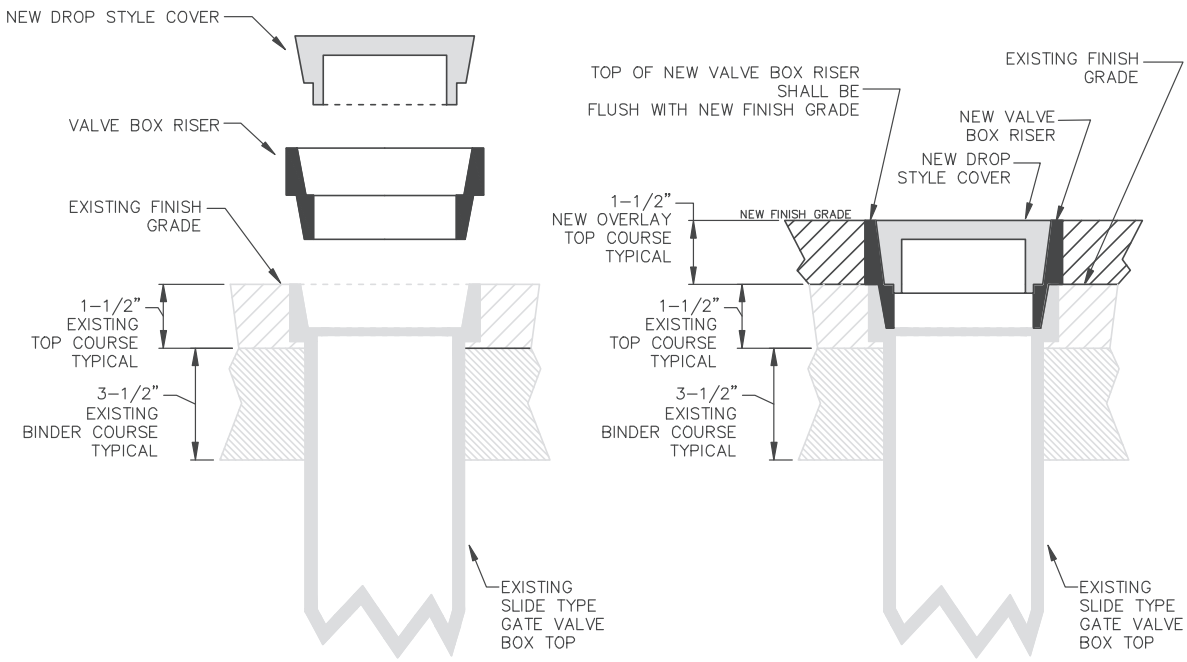
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-08.0	REV. DATE
		4/1/08 MAB
		4/1/09 MAB
	VALVE BOX	4/1/10 MAB
		1/9/19 DJP
	SCALE: NTS	



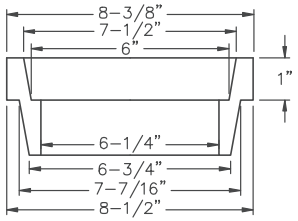
NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

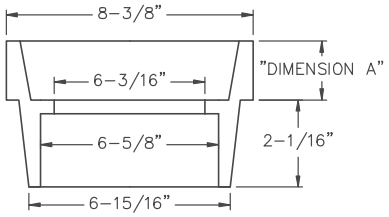
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-08.1	REV. DATE
		4/1/09 MAB
	REPLACE, RAISE OR RESET VALVE BOX	1/10/19 DJP
	SCALE: NTS	



VALVE BOX RISER INSTALLED

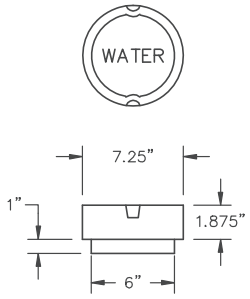


1"
VALVE BOX RISER



1-1/2"-6"
STANDARD VALVE BOX RISER

RISER HEIGHT INCREASE DIMENSION "A"
1"
1-1/2"
2"
3"
4"
6"

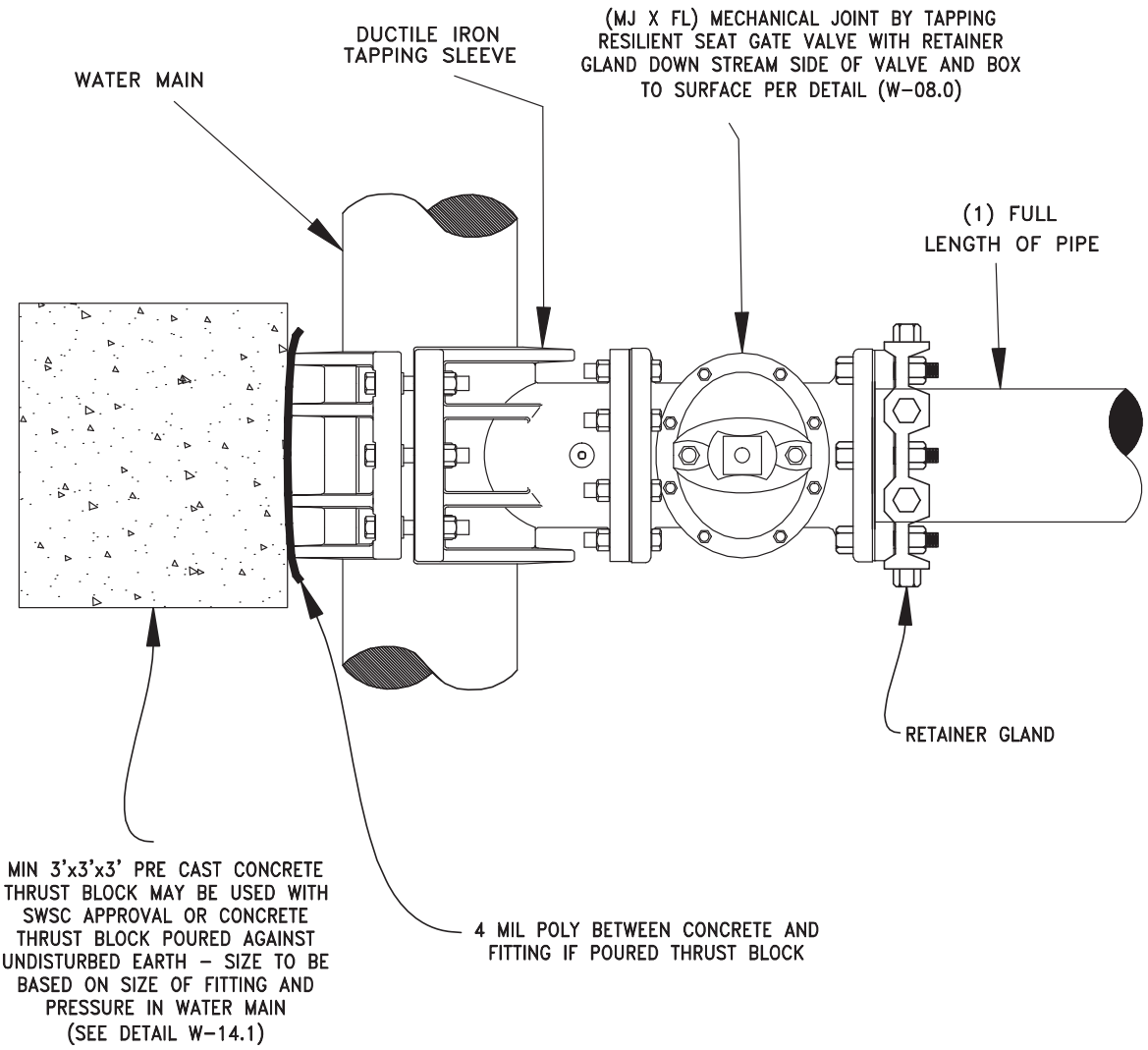


NEW DROP STYLE COVER
THE WORD "WATER"
MUST BE CAST INTO COVER
AND SHALL WEIGH
NO LESS THAN 13 POUNDS

NOTE: THESE RISERS WILL WORK SATISFACTORILY WITH MOST 5-1/4" VALVE BOXES.

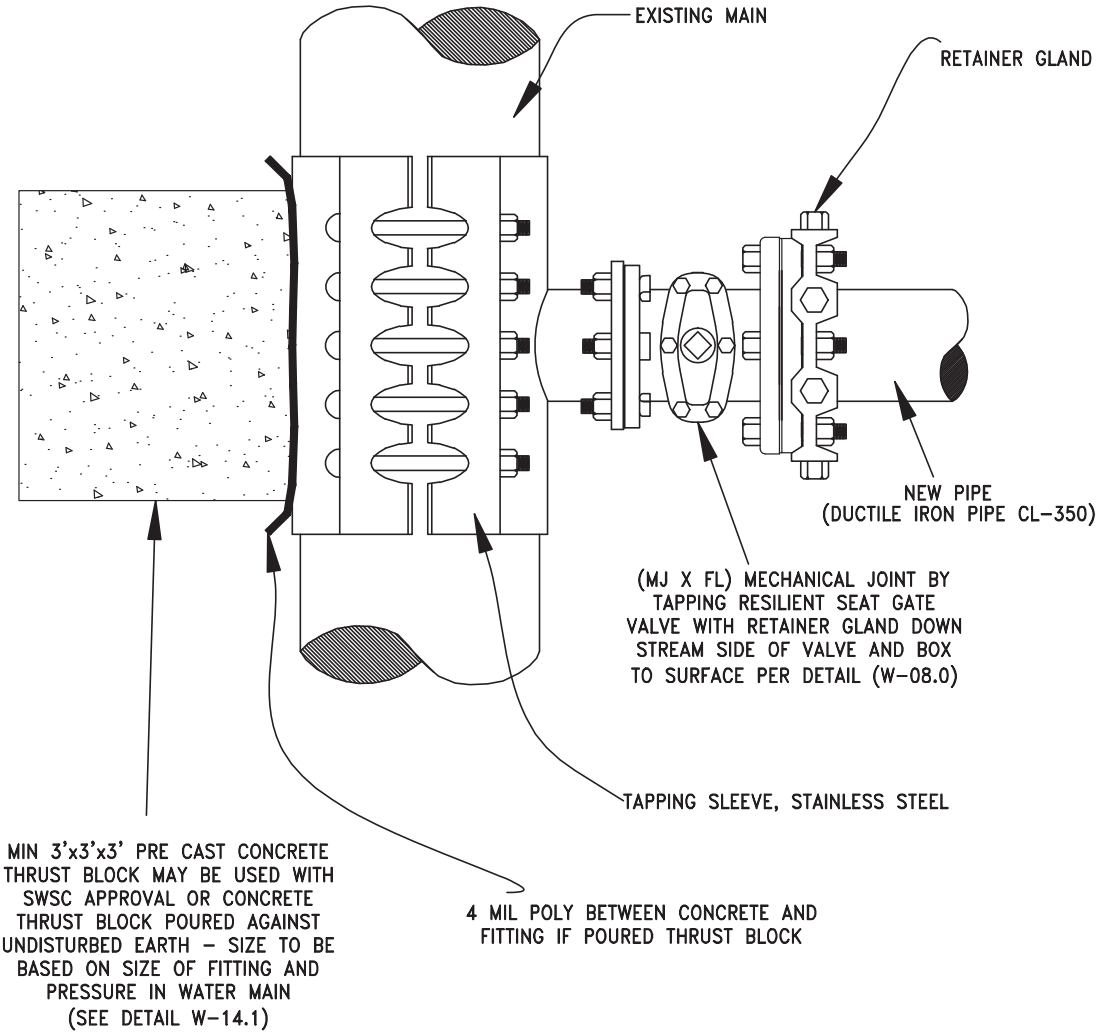
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-08.2	REV. DATE 4/1/09 MAB
	RAISE VALVE BOX WITH RISER	
	SCALE: NTS	



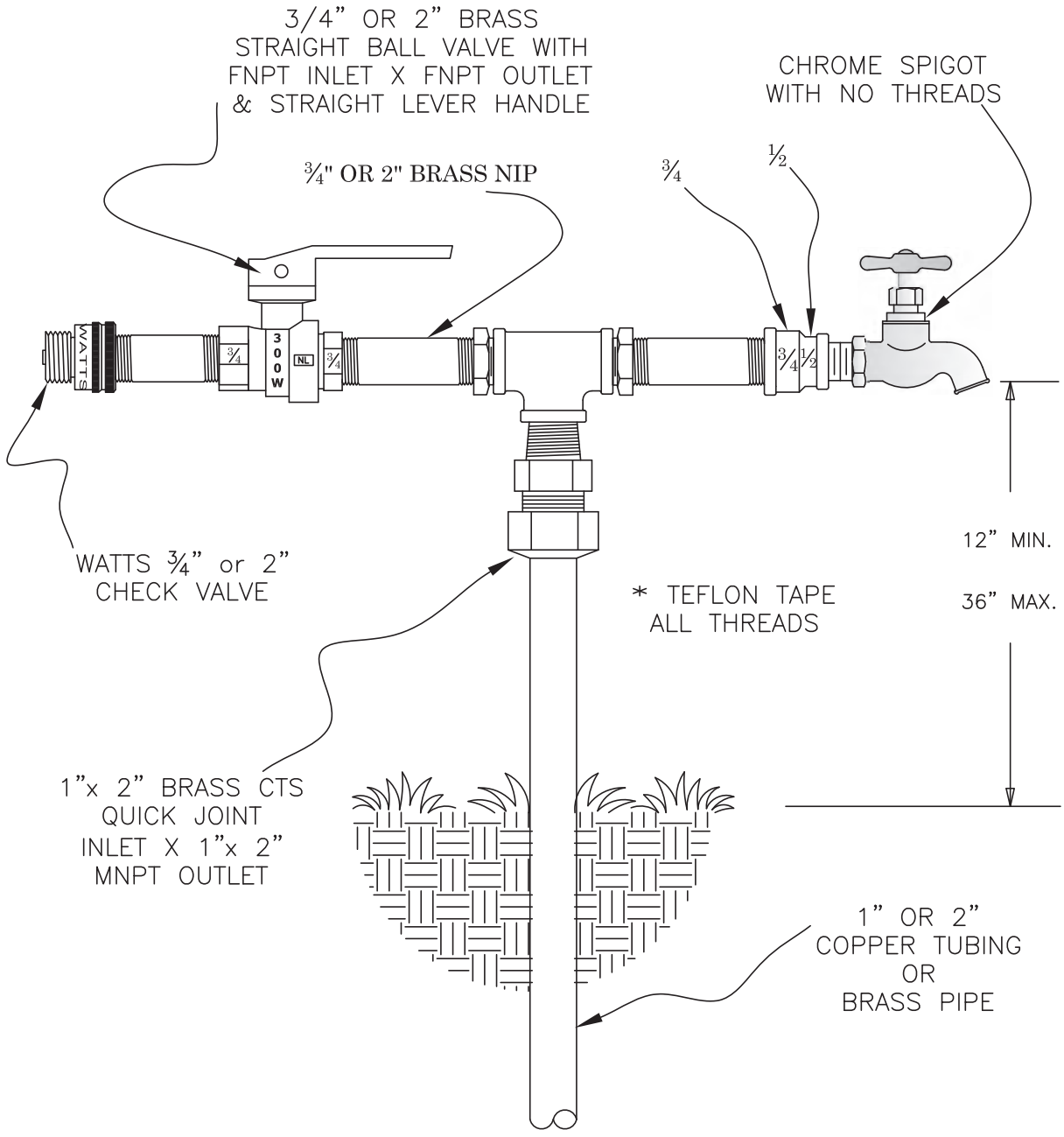
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-09.0	REV. DATE
		4/1/08 MAB
	DUCTILE IRON TAPPING SLEEVE	
	SCALE: NTS	



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

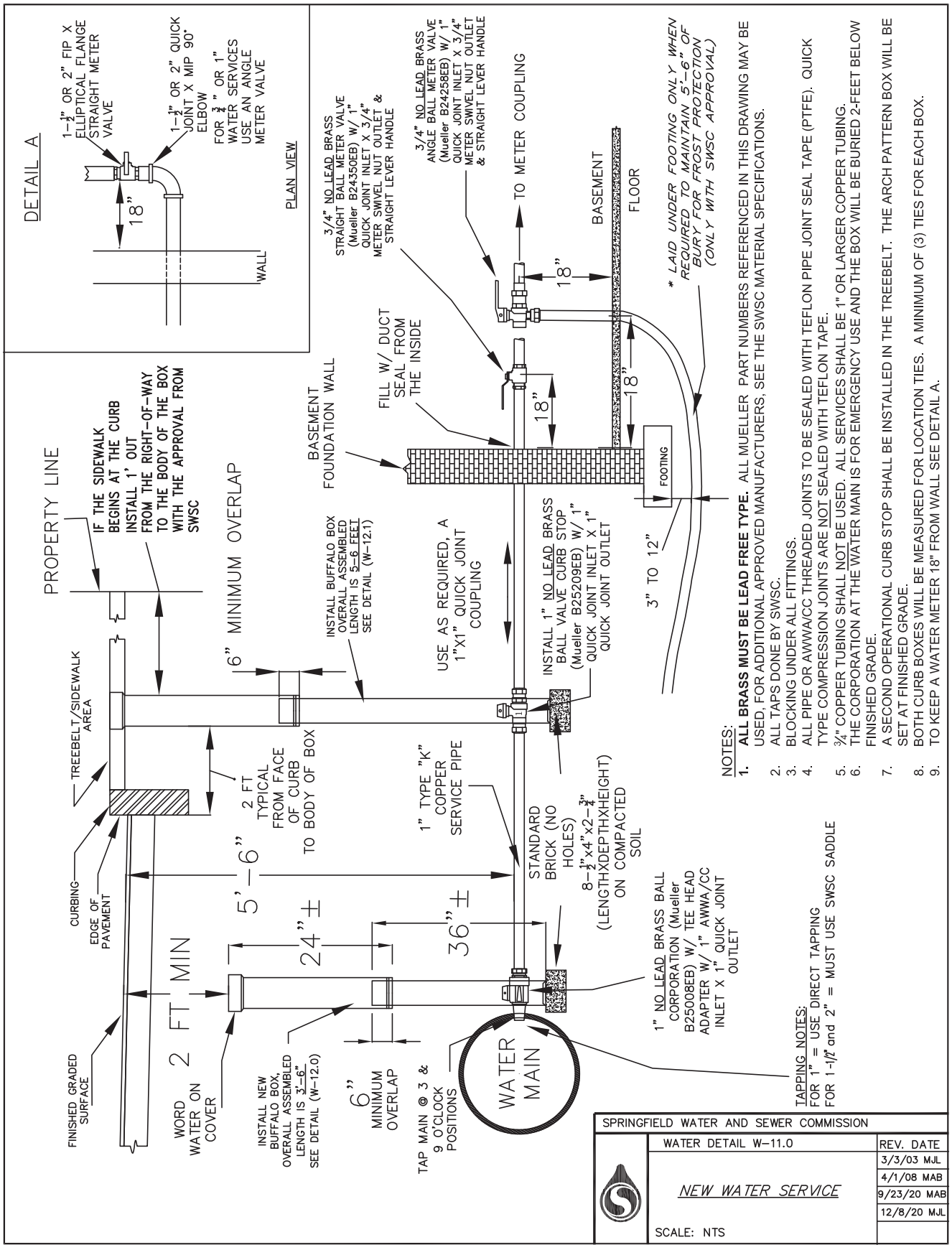
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-09.1	REV. DATE
	STAINLESS STEEL TAPPING SLEEVE	4/1/08 MAB
	SCALE: NTS	

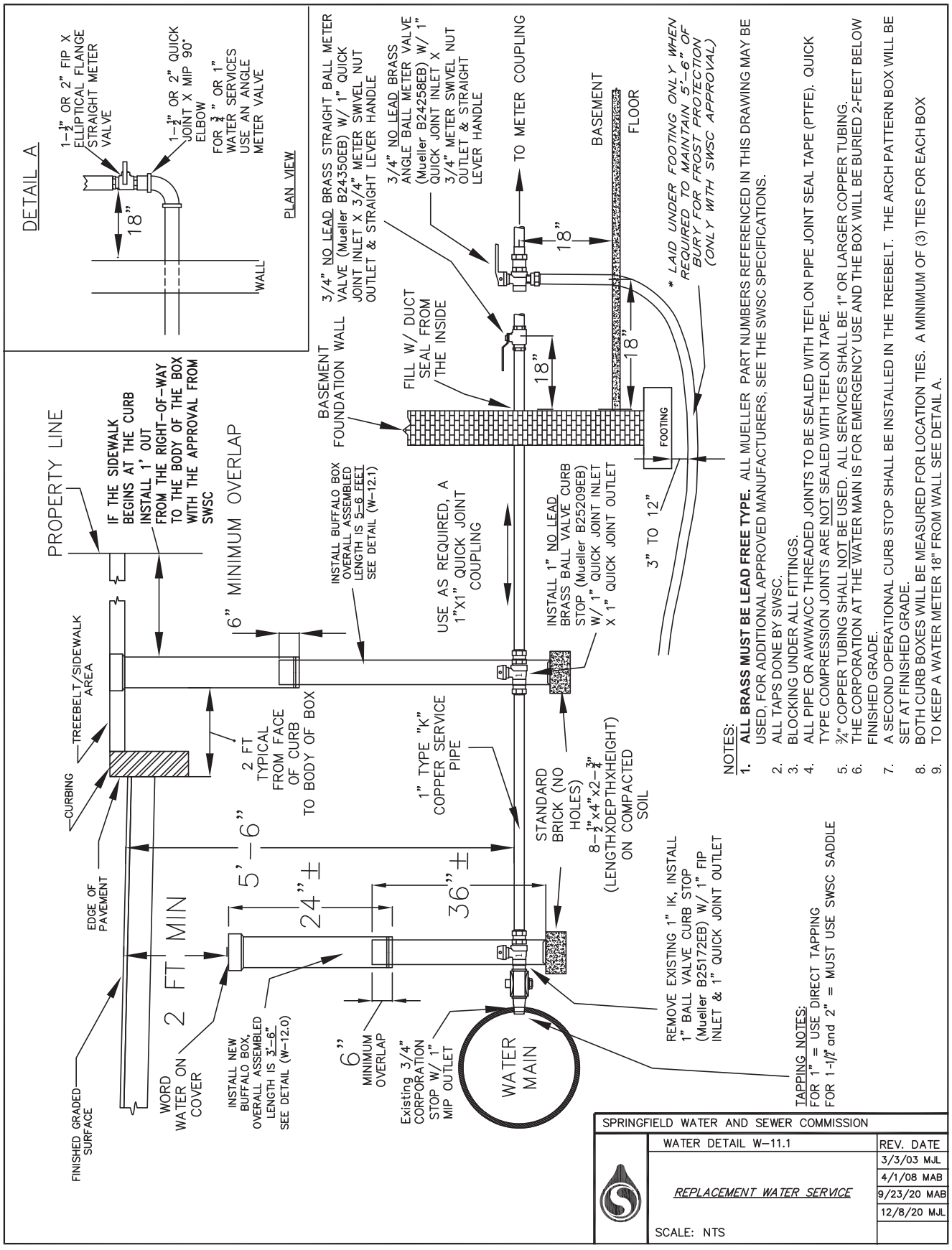


NOTES:

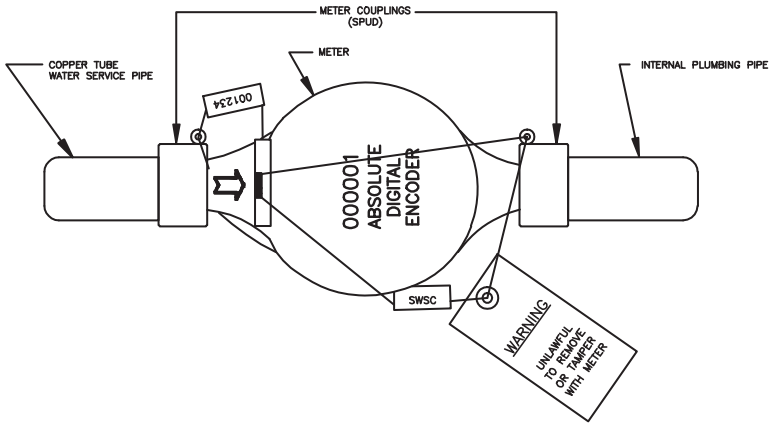
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–10.0	REV. DATE
	FLUSHING DEVICE	1/6/07 MJL 4/1/08 MAB 6/18/08 MAB
	SCALE: NTS	

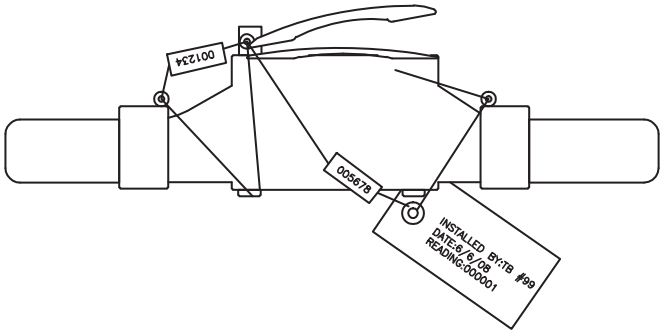

DETAIL A
1-½" OR 2" FIP X ELLIPTICAL FLANGE STRAIGHT METER VALVE
1-½" OR 2" QUICK JOINT X MIP 90° ELBOW
FOR ¾" OR 1" WATER SERVICES USE AN ANGLE METER VALVE
18"
WALL
PLAN VIEW
PROPERTY LINE
IF THE SIDEWALK BEGINS AT THE CURB INSTALL 1' OUT FROM THE RIGHT-OF-WAY TO THE BODY OF THE BOX WITH THE APPROVAL FROM SWSC
6" MINIMUM OVERLAP
BASEMENT FOUNDATION WALL
FILL W/ DUCT SEAL FROM THE INSIDE
3/4" NO LEAD BRASS STRAIGHT BALL METER VALVE (Mueller B24350EB) W/ 1" QUICK JOINT INLET X 3/4" METER SWIVEL NUT OUTLET & STRAIGHT LEVER HANDLE
3/4" NO LEAD BRASS ANGLE BALL METER VALVE (Mueller B24258EB) W/ 1" QUICK JOINT INLET X 3/4" METER SWIVEL NUT OUTLET & STRAIGHT LEVER HANDLE
TO METER COUPLING
18"
BASEMENT FLOOR
* LAID UNDER FOOTING ONLY WHEN REQUIRED TO MAINTAIN 5'-6" OF BURY FOR FROST PROTECTION (ONLY WITH SWSC APPROVAL)
FOOTING
3" TO 12"
INSTALL BUFFALO BOX OVERALL ASSEMBLED LENGTH IS 5-6 FEET SEE DETAIL (W-12.1)
USE AS REQUIRED, A 1"X1" QUICK JOINT COUPLING
INSTALL 1" NO LEAD BRASS BALL VALVE CURB STOP (Mueller B25209EB) W/ 1" QUICK JOINT INLET X 1" QUICK JOINT OUTLET
TREEBELT/SIDEWALK AREA
CURBING
EDGE OF PAVEMENT
2 FT TYPICAL FROM FACE OF CURB TO BODY OF BOX
5'-6"
1" TYPE "K" COPPER SERVICE PIPE
STANDARD BRICK (NO HOLES) 8-½"x4"x2-¾" (LENGTHXDEPTHXHEIGHT) ON COMPACTED SOIL
2 FT MIN
24"±
36"±
FINISHED GRADED SURFACE
WORD WATER ON COVER
INSTALL NEW BUFFALO BOX, OVERALL ASSEMBLED LENGTH IS 3'-6" SEE DETAIL (W-12.0)
6" MINIMUM OVERLAP
TAP MAIN @ 3 & 9 O'CLOCK POSITIONS
WATER MAIN
1" NO LEAD BRASS CORPORATION (Mueller B25008EB) W/ TEE HEAD ADAPTER W/ 1" AWWA/CC INLET X 1" QUICK JOINT OUTLET
TAPPING NOTES:
FOR 1" = USE DIRECT TAPPING
FOR 1-½" and 2" = MUST USE SWSC SADDLE
NOTES:
1. ALL BRASS MUST BE LEAD FREE TYPE. ALL MUELLER PART NUMBERS REFERENCED IN THIS DRAWING MAY BE USED, FOR ADDITIONAL APPROVED MANUFACTURERS, SEE THE SWSC MATERIAL SPECIFICATIONS.
2. ALL TAPS DONE BY SWSC.
3. BLOCKING UNDER ALL FITTINGS.
4. ALL PIPE OR AWWA/CC THREADED JOINTS TO BE SEALED WITH TEFLON PIPE JOINT SEAL TAPE (PTFE). QUICK TYPE COMPRESSION JOINTS ARE NOT SEALED WITH TEFLON TAPE.
5. ¾" COPPER TUBING SHALL NOT BE USED. ALL SERVICES SHALL BE 1" OR LARGER COPPER TUBING.
6. THE CORPORATION AT THE WATER MAIN IS FOR EMERGENCY USE AND THE BOX WILL BE BURIED 2-FEET BELOW FINISHED GRADE.
7. A SECOND OPERATIONAL CURB STOP SHALL BE INSTALLED IN THE TREEBELT. THE ARCH PATTERN BOX WILL BE SET AT FINISHED GRADE.
8. BOTH CURB BOXES WILL BE MEASURED FOR LOCATION TIES. A MINIMUM OF (3) TIES FOR EACH BOX.
9. TO KEEP A WATER METER 18" FROM WALL SEE DETAIL A.
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-11.0
NEW WATER SERVICE
SCALE: NTS
REV. DATE
3/3/03 MJL
4/1/08 MAB
9/23/20 MAB
12/8/20 MJL


DETAIL A
1-½" OR 2" FIP X ELLIPTICAL FLANGE STRAIGHT METER VALVE
1-½" OR 2" QUICK JOINT X MIP 90° ELBOW
FOR ¾" OR 1" WATER SERVICES USE AN ANGLE METER VALVE
18"
WALL
PLAN VIEW
PROPERTY LINE
IF THE SIDEWALK BEGINS AT THE CURB INSTALL 1' OUT FROM THE RIGHT-OF-WAY TO THE BODY OF THE BOX WITH THE APPROVAL FROM SWSC
6" MINIMUM OVERLAP
BASEMENT FOUNDATION WALL
3/4" NO LEAD BRASS STRAIGHT BALL METER VALVE (Mueller B24350EB) W/ 1" QUICK JOINT INLET X 3/4" METER SWIVEL NUT OUTLET & STRAIGHT LEVER HANDLE
3/4" NO LEAD BRASS ANGLE BALL METER VALVE (Mueller B24258EB) W/ 1" QUICK JOINT INLET X 3/4" METER SWIVEL NUT OUTLET & STRAIGHT LEVER HANDLE
FILL W/ DUCT SEAL FROM THE INSIDE
TO METER COUPLING
BASEMENT FLOOR
18"
18"
18"
* LAID UNDER FOOTING ONLY WHEN REQUIRED TO MAINTAIN 5'-6" OF BURY FOR FROST PROTECTION (ONLY WITH SWSC APPROVAL)
FOOTING
3" TO 12"
INSTALL BUFFALO BOX OVERALL ASSEMBLED LENGTH IS 5-6 FEET SEE DETAIL (W-12.1)
USE AS REQUIRED, A 1"X1" QUICK JOINT COUPLING
INSTALL 1" NO LEAD BRASS BALL VALVE CURB STOP (Mueller B25209EB) W/ 1" QUICK JOINT INLET X 1" QUICK JOINT OUTLET
CURBING
TREEBELT/SIDEWALK AREA
2 FT TYPICAL FROM FACE OF CURB TO BODY OF BOX
1" TYPE "K" COPPER SERVICE PIPE
STANDARD BRICK (NO HOLES) 8-½"x4"x2-¾" (LENGTHXDEPTHXHEIGHT) ON COMPACTED SOIL
EDGE OF PAVEMENT
5'-6"
24"±
36"±
2 FT MIN
WORD WATER ON COVER
INSTALL NEW BUFFALO BOX, OVERALL ASSEMBLED LENGTH IS 3'-6" SEE DETAIL (W-12.0)
6" MINIMUM OVERLAP
Existing 3/4" CORPORATION STOP W/ 1" MIP OUTLET
WATER MAIN
FINISHED GRADED SURFACE
REMOVE EXISTING 1" IK, INSTALL 1" BALL VALVE CURB STOP (Mueller B25172EB) W/ 1" FIP INLET & 1" QUICK JOINT OUTLET
TAPPING NOTES:
FOR 1" = USE DIRECT TAPPING
FOR 1-½" and 2" = MUST USE SWSC SADDLE
NOTES:
1. ALL BRASS MUST BE LEAD FREE TYPE. ALL MUELLER PART NUMBERS REFERENCED IN THIS DRAWING MAY BE USED, FOR ADDITIONAL APPROVED MANUFACTURERS, SEE THE SWSC SPECIFICATIONS.
2. ALL TAPS DONE BY SWSC.
3. BLOCKING UNDER ALL FITTINGS.
4. ALL PIPE OR AWWA/CC THREADED JOINTS TO BE SEALED WITH TEFLON PIPE JOINT SEAL TAPE (PTFE). QUICK TYPE COMPRESSION JOINTS ARE NOT SEALED WITH TEFLON TAPE.
5. ¾" COPPER TUBING SHALL NOT BE USED. ALL SERVICES SHALL BE 1" OR LARGER COPPER TUBING.
6. THE CORPORATION AT THE WATER MAIN IS FOR EMERGENCY USE AND THE BOX WILL BE BURIED 2-FEET BELOW FINISHED GRADE.
7. A SECOND OPERATIONAL CURB STOP SHALL BE INSTALLED IN THE TREEBELT. THE ARCH PATTERN BOX WILL BE SET AT FINISHED GRADE.
8. BOTH CURB BOXES WILL BE MEASURED FOR LOCATION TIES. A MINIMUM OF (3) TIES FOR EACH BOX
9. TO KEEP A WATER METER 18" FROM WALL SEE DETAIL A.
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-11.1
REPLACEMENT WATER SERVICE
SCALE: NTS
REV. DATE
3/3/03 MJL
4/1/08 MAB
9/23/20 MAB
12/8/20 MJL

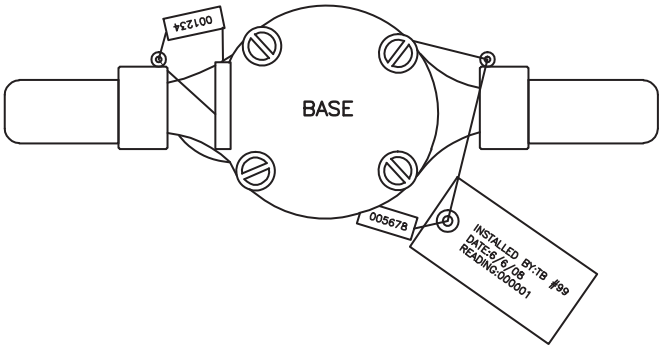
"TOP VIEW"



"SIDE VIEW"



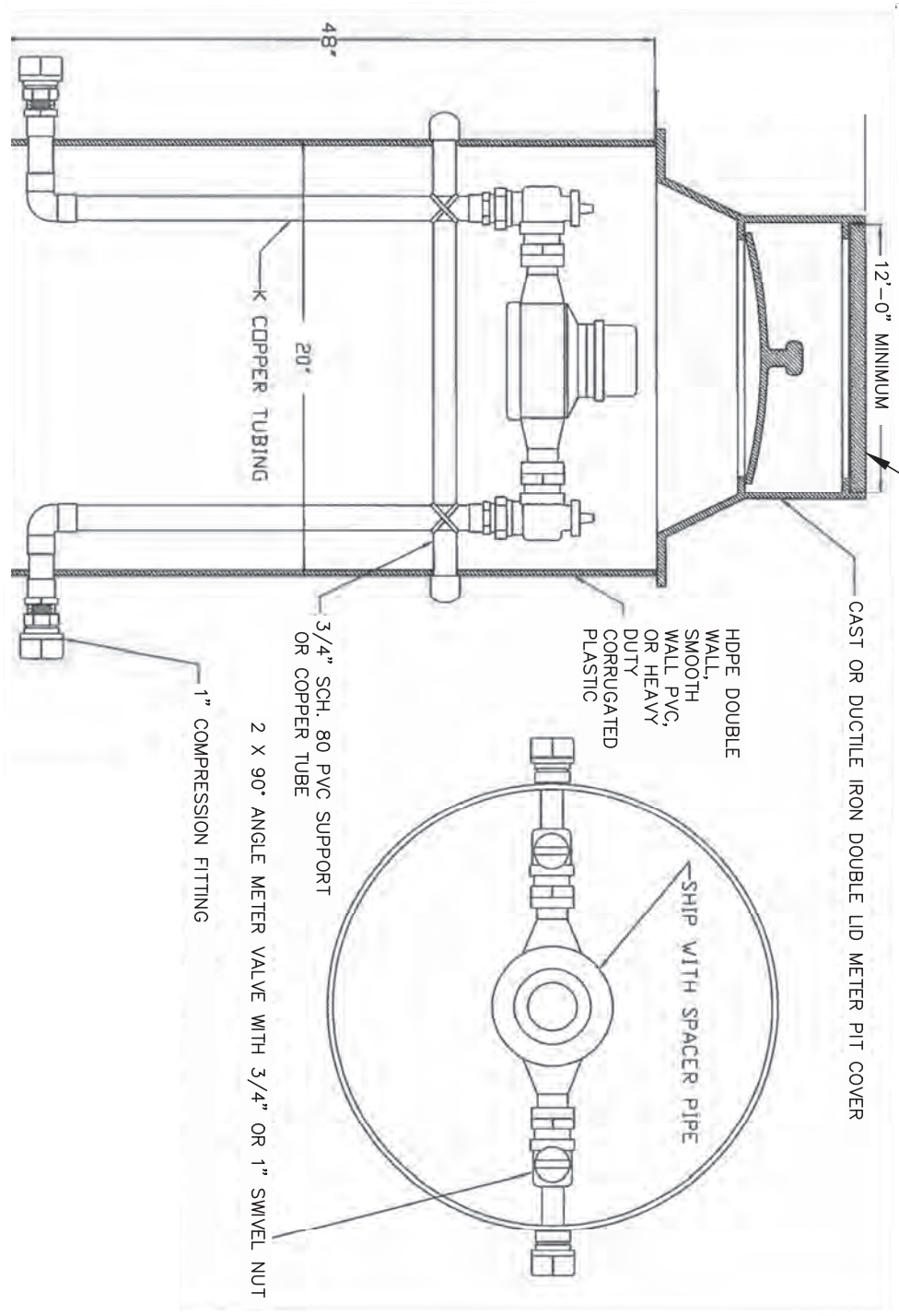
"BOTTOM VIEW"



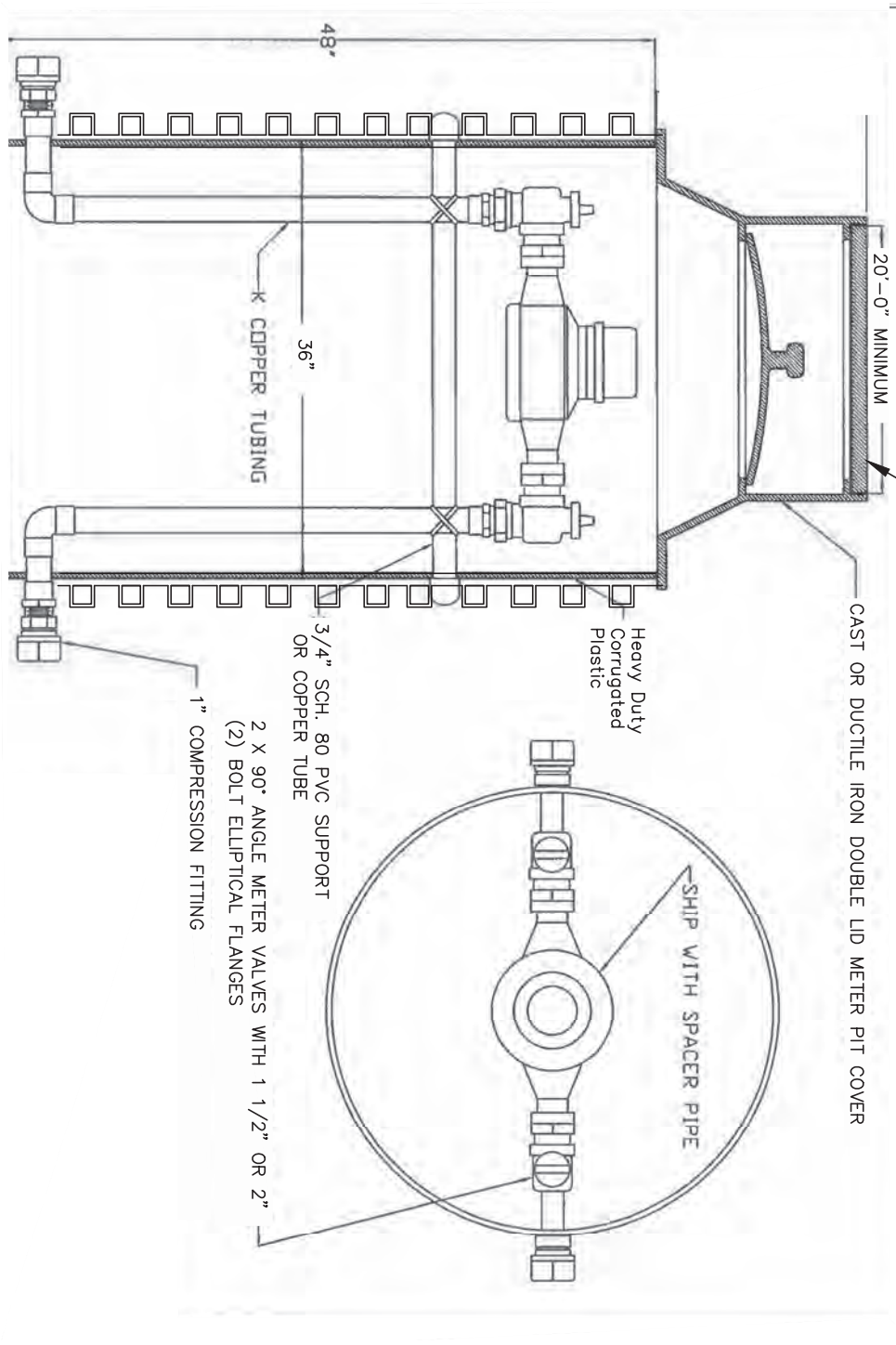
NOTES:

1. **METERS SHALL BE SEALED BY COMMISSION INSTALLERS & METER READERS ONLY.**

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–11.2	REV. DATE
	WATER METER SEALING DETAIL	6/18/08 MAB
	SCALE: NTS	

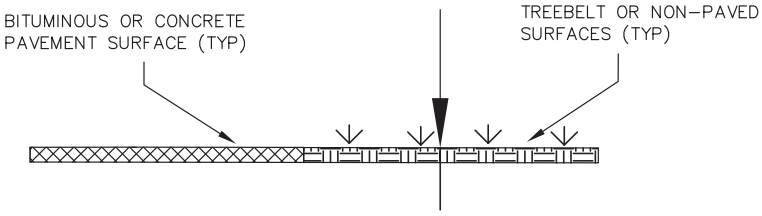


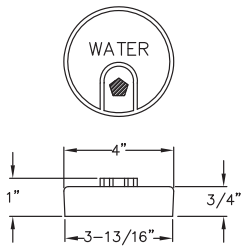
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-11.3	REV. DATE
	PLASTIC METER PIT FOR 5/8"-1" METERS	9/18/18 DJP
		7/30/20 LMB
	SCALE: NTS	



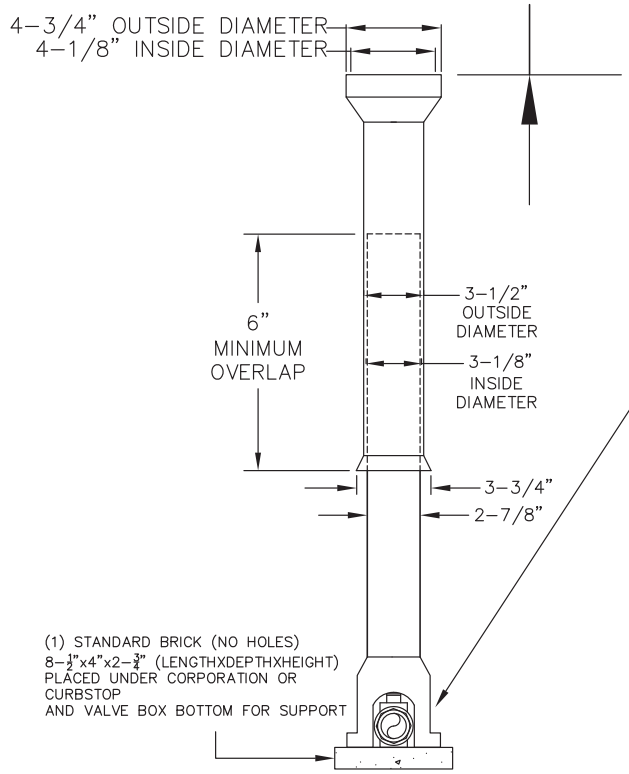
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-11.4	REV. DATE
	PLASTIC METER PIT FOR $1\frac{1}{2}$"-2" METERS	9/18/18 DJP
		7/30/20 LMB
	SCALE: NTS	

SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-11.5
REV. DATE
10/27/20 MJL
TYPICAL YARD HYDRANT
SCALE: NTS
NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
2. ALL 2-INCH PIPING SHALL BE THREADED BRASS.
3. VALVE BOX AND METER PIT SHALL BE SUPPORTED USING BLOCKS.
WATER MAIN
6"
2 FT MIN
2" CORP
STANDARD BRICK (NO HOLES) 8-½" X 4" X 2-¾" (LENGTH X DEPTH X HEIGHT) ON COMPACTED SOIL
2" BALL VALVE CURB STOP
2" BRASS PIPE W/ THREADED ENDS
GROUND
IN
OUT
SWSC STANDARD PLASTIC METER PIT & COVER
2" METER SETTER W/ 2" FIP THREADS & STANDARD ELIPTICAL METER CONNECTIONS
(2) 2" BRASS SWING ELBOWS FOR RELIEF
3'-6"
5'-6" MINIMUM
2" KUPFERLE YARD HYDRANT #80WD W/ 2" FIP INLET X 2.5" NST OUTLET
BACKFILL W/ CRUSHED STONE
THRUST BLOCK
INSTALLER TO SPECIFY INLET DEPTH OF BURY
3'-0"





SERVICE BOX COVER
WITH BRASS PENTAGON HEAD NUT
AND THE WORD "WATER" CAST INTO COVER



SLIDE TYPE
BUFFALO SERVICE BOX

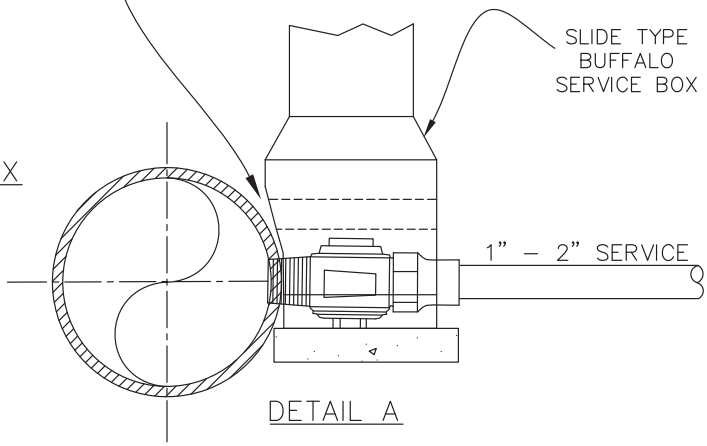
STANDARD SERVICE BOX SEE SWSC TECHNICAL SPECIFICATIONS

THE ARCH PATTERN BASE SHALL ACCOMMODATE 3/4 TO 2-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS.

A.) FOR 1-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS THE ARCH SHALL BE AT LEAST 5-INCHES TALL WITH A 3-INCH BY 3-INCH ARCH & CENTERED OVER 1-INCH BALL TYPE CORPORATION.

B.) FOR 1-1/2-INCH TO 2-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS THE ARCH SHALL BE AT LEAST 7-INCHES TALL WITH A 4-INCH BY 4-INCH ARCH.

APPROXIMATELY 1/2" TO BE REMOVED FROM SIDE OF BASE CLOSEST TO WATER MAIN IN ORDER TO CONFIRM THE BASE IS OVER THE 1-1/2"-2" BALL TYPE CURB STOPS (SEE DETAIL A).

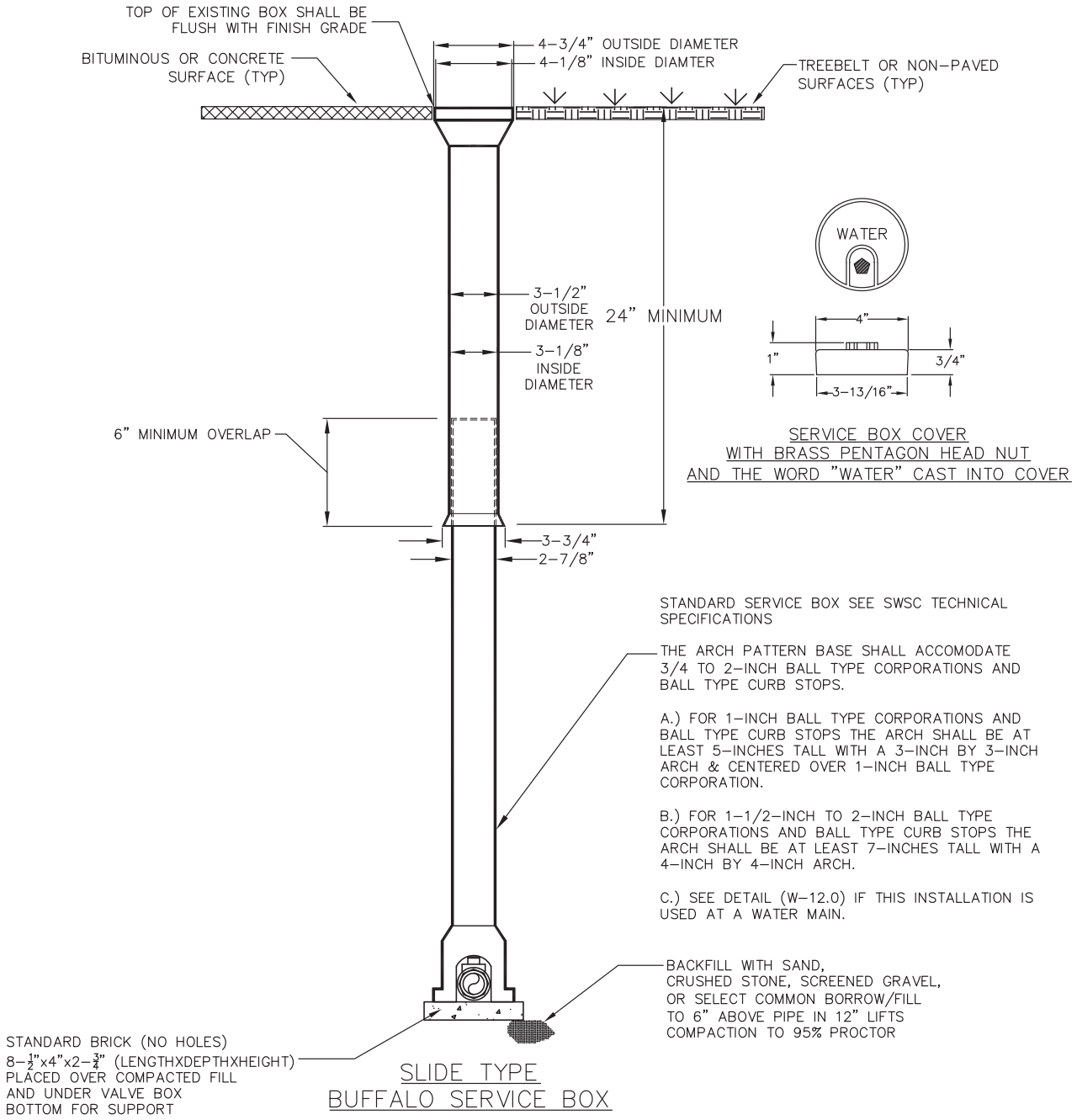


DETAIL A

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-12.0	REV. DATE
		4/1/08 MAB
	TYPICAL SERVICE BOX DETAIL IN PAVED AREAS	4/1/09 MAB
		1/9/19 DJP
	SCALE: NTS	

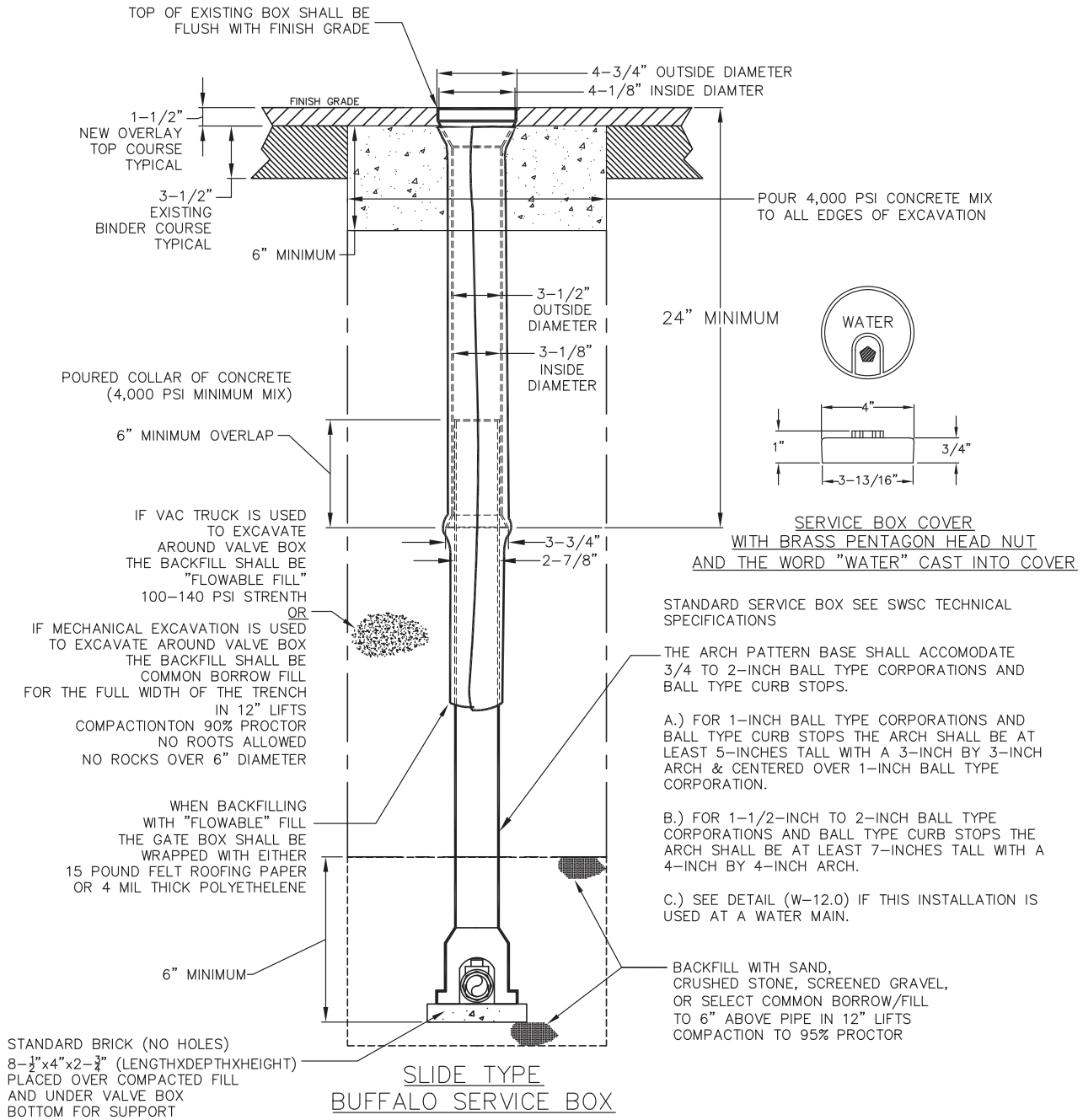


SLIDE TYPE
BUFFALO SERVICE BOX

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. IF BACKFILLING WITH "FLOWABLE" FILL WRAP THE SERVICE BOX WITH 15 POUND FELT ROOFING PAPER OR 4 MIL THICK POLYETHYLENE IN ACCORDANCE WITH DETAIL W-12.2.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-12.1	REV. DATE
	TYPICAL SERVICE BOX DETAIL IN NON-PAVED AREAS	4/1/08 MAB 4/1/09 MAB 4/1/10 MAB 1/9/19 DJP
	SCALE: NTS	

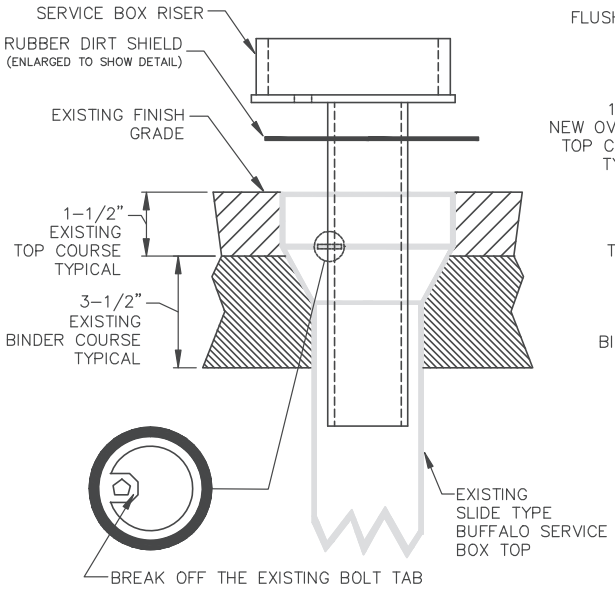


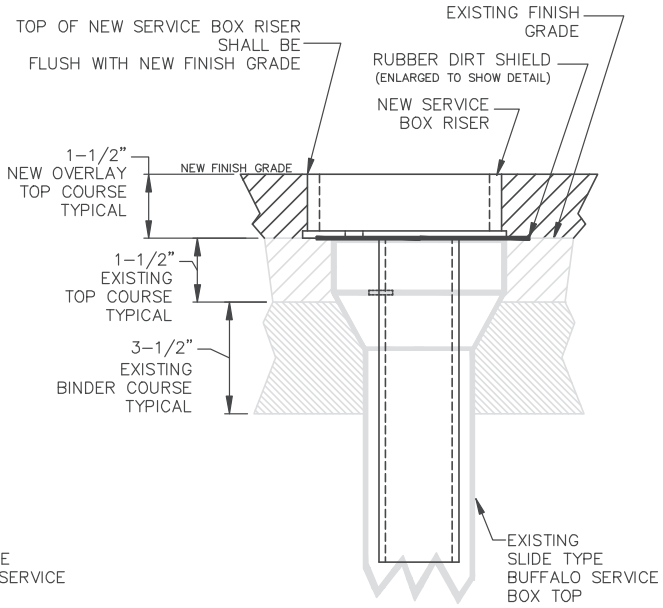
SLIDE TYPE
BUFFALO SERVICE BOX

NOTES:

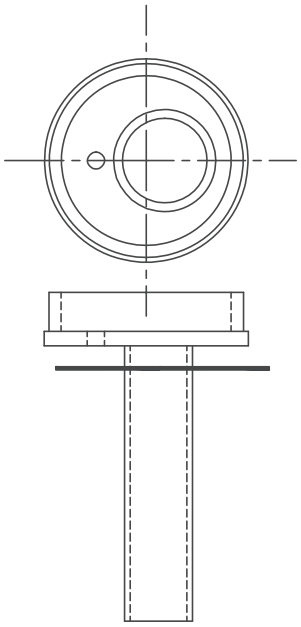
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–12.2	REV. DATE
		4/1/09 MAB
	REPLACE, RAISE OR RESET SERVICE BOX	1/9/19 DJP
	SCALE: NTS	

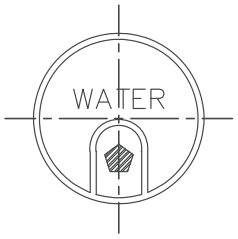


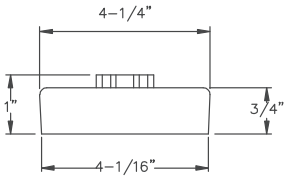


SERVICE BOX RISER INSTALLED



SERVICE BOX RISER

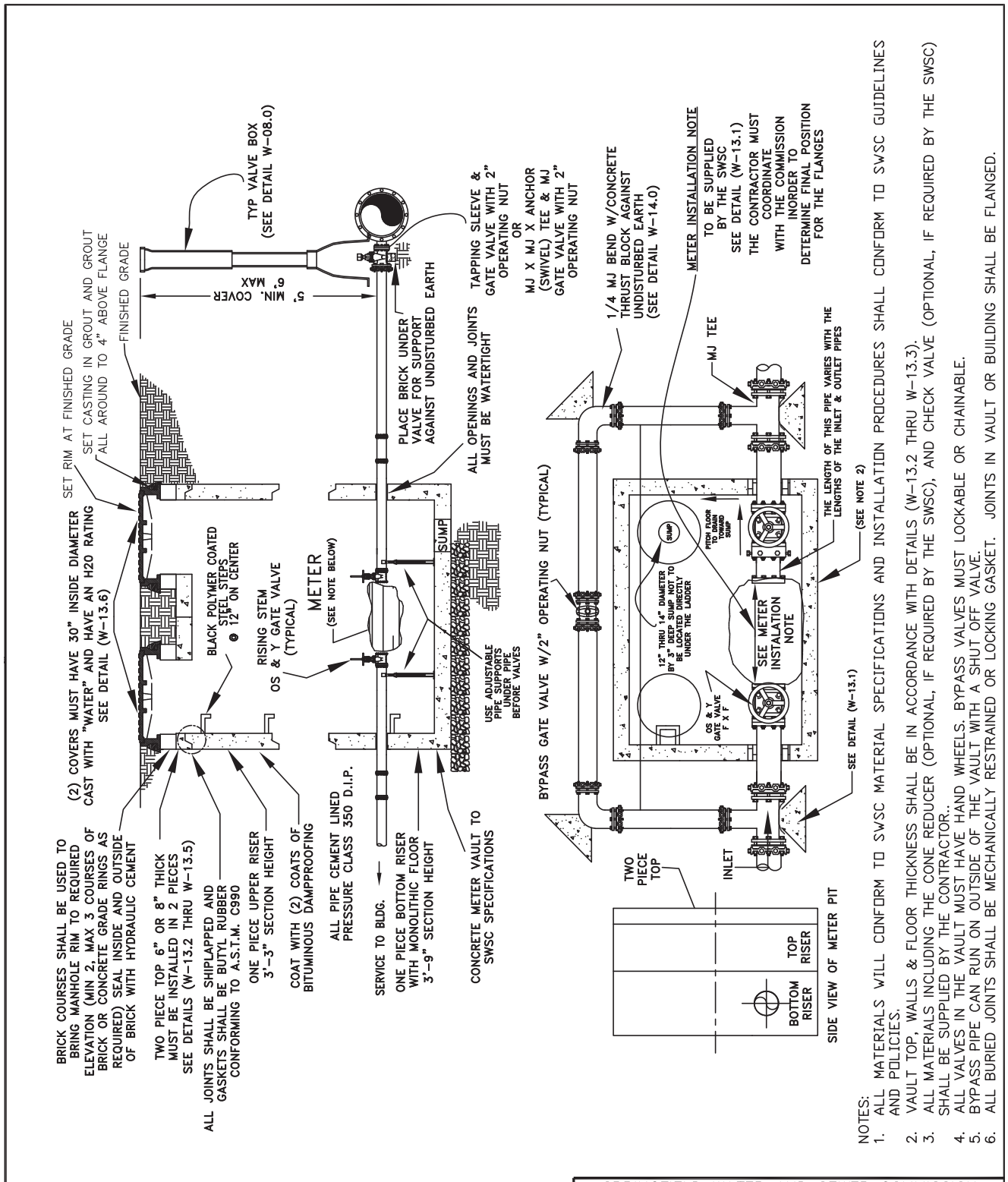




SERVICE BOX RISER COVER
WITH BRASS PENTAGON HEAD NUT
AND THE WORD "WATER" CAST INTO COVER

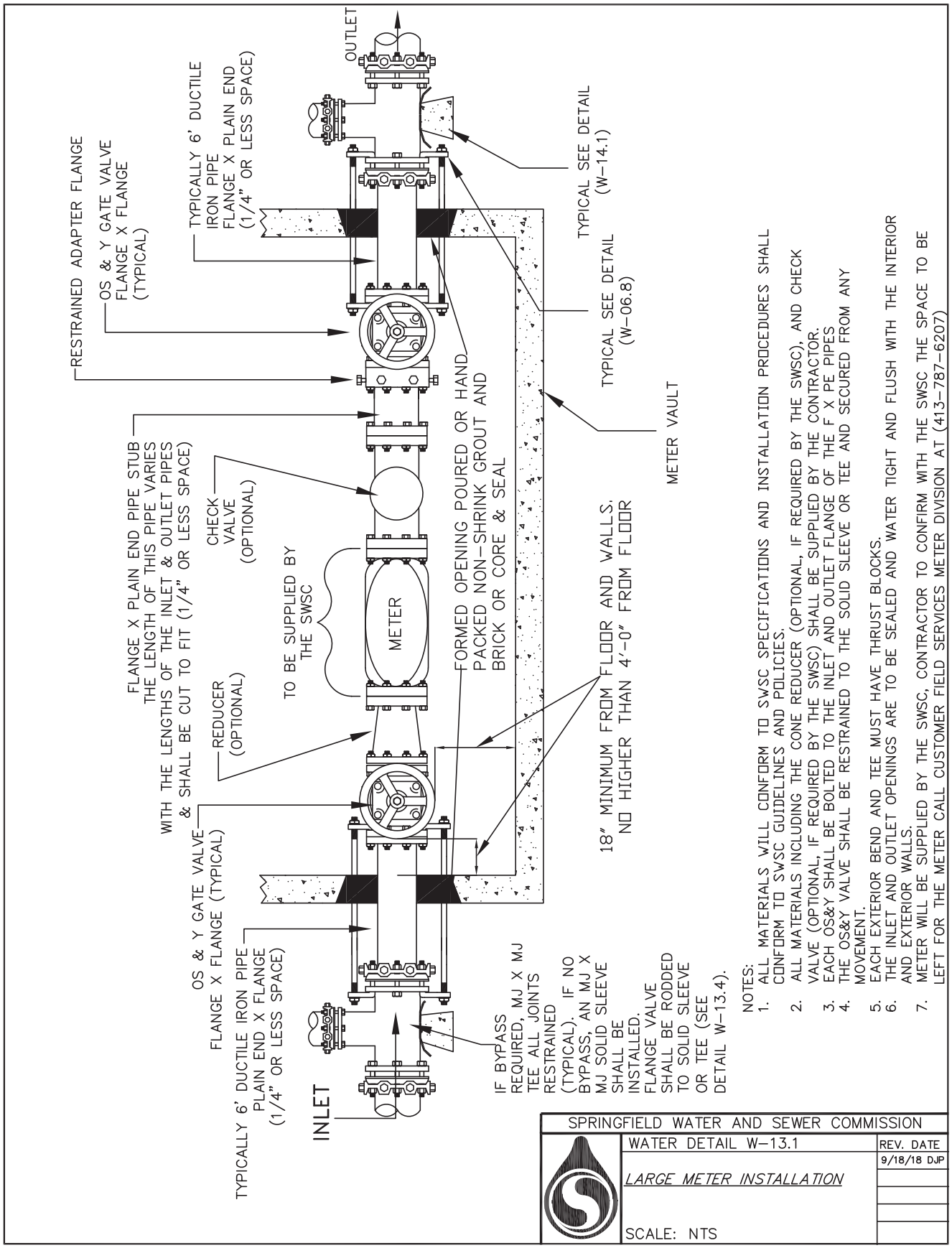
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–12.3	REV. DATE 4/1/09 MAB
	RAISE SERVICE BOX WITH RISER	
	SCALE: NTS	



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W-13.2 THRU W-13.3).
3. ALL MATERIALS INCLUDING THE CONE REDUCER (OPTIONAL, IF REQUIRED BY THE SWSC), AND CHECK VALVE (OPTIONAL, IF REQUIRED BY THE SWSC) SHALL BE SUPPLIED BY THE CONTRACTOR..
4. ALL VALVES IN THE VAULT MUST HAVE HAND WHEELS. BYPASS VALVES MUST LOCKABLE OR CHAINABLE.
5. BYPASS PIPE CAN RUN ON OUTSIDE OF THE VAULT WITH A SHUT OFF VALVE.
6. ALL BURIED JOINTS SHALL BE MECHANICALLY RESTRAINED OR LOCKING GASKET. JOINTS IN VAULT OR BUILDING SHALL BE FLANGED.

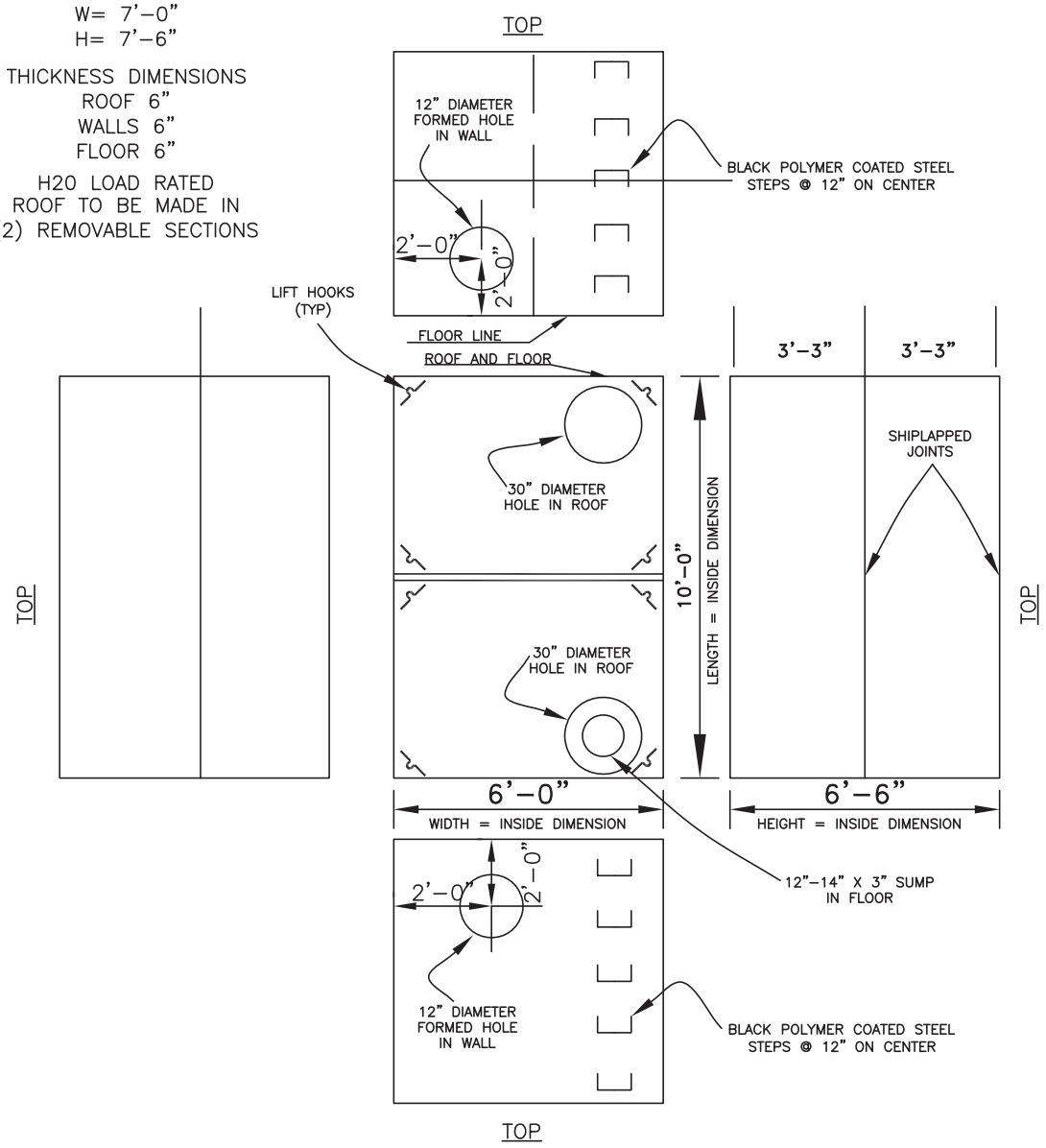
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.0	REV. DATE
	METER VAULT PIPING	9/18/18 DJP
	SCALE: NTS	


RESTRAINED ADAPTER FLANGE
OS & Y GATE VALVE FLANGE X FLANGE (TYPICAL)
TYPICALLY 6' DUCTILE IRON PIPE FLANGE X PLAIN END (1/4" OR LESS SPACE)
OUTLET
TYPICAL SEE DETAIL (W-14.1)
TYPICAL SEE DETAIL (W-06.8)
METER VAULT
FLANGE X PLAIN END PIPE STUB WITH THE LENGTHS OF THIS PIPE VARIES THE LENGTH OF THE INLET & OUTLET PIPES & SHALL BE CUT TO FIT (1/4" OR LESS SPACE)
CHECK VALVE (OPTIONAL)
REDUCER (OPTIONAL)
TO BE SUPPLIED BY THE SWSC
METER
FORMED OPENING POURED OR HAND PACKED NON-SHRINK GROUT AND BRICK OR CORE & SEAL
18" MINIMUM FROM FLOOR AND WALLS. NO HIGHER THAN 4'-0" FROM FLOOR
OS & Y GATE VALVE FLANGE X FLANGE (TYPICAL)
TYPICALLY 6' DUCTILE IRON PIPE PLAIN END X FLANGE (1/4" OR LESS SPACE)
INLET
IF BYPASS REQUIRED, MJ X MJ TEE ALL JOINTS RESTRAINED (TYPICAL). IF NO BYPASS, AN MJ X MJ SOLID SLEEVE SHALL BE INSTALLED. FLANGE VALVE SHALL BE RODDED TO SOLID SLEEVE OR TEE (SEE DETAIL W-13.4).
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL MATERIALS INCLUDING THE CONE REDUCER (OPTIONAL, IF REQUIRED BY THE SWSC), AND CHECK VALVE (OPTIONAL, IF REQUIRED BY THE SWSC) SHALL BE SUPPLIED BY THE CONTRACTOR.
3. EACH OS&Y SHALL BE BOLTED TO THE INLET AND OUTLET FLANGE OF THE F X PE PIPES
4. THE OS&Y VALVE SHALL BE RESTRAINED TO THE SOLID SLEEVE OR TEE AND SECURED FROM ANY MOVEMENT.
5. EACH EXTERIOR BEND AND TEE MUST HAVE THRUST BLOCKS.
6. THE INLET AND OUTLET OPENINGS ARE TO BE SEALED AND WATER TIGHT AND FLUSH WITH THE INTERIOR AND EXTERIOR WALLS.
7. METER WILL BE SUPPLIED BY THE SWSC, CONTRACTOR TO CONFIRM WITH THE SWSC THE SPACE TO BE LEFT FOR THE METER CALL CUSTOMER FIELD SERVICES METER DIVISION AT (413-787-6207)
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-13.1
REV. DATE
9/18/18 DJP
LARGE METER INSTALLATION
SCALE: NTS

OUTSIDE DIMENSIONS
L= 11'–0"
W= 7'–0"
H= 7'–6"

THICKNESS DIMENSIONS
ROOF 6"
WALLS 6"
FLOOR 6"

H20 LOAD RATED
ROOF TO BE MADE IN
(2) REMOVABLE SECTIONS



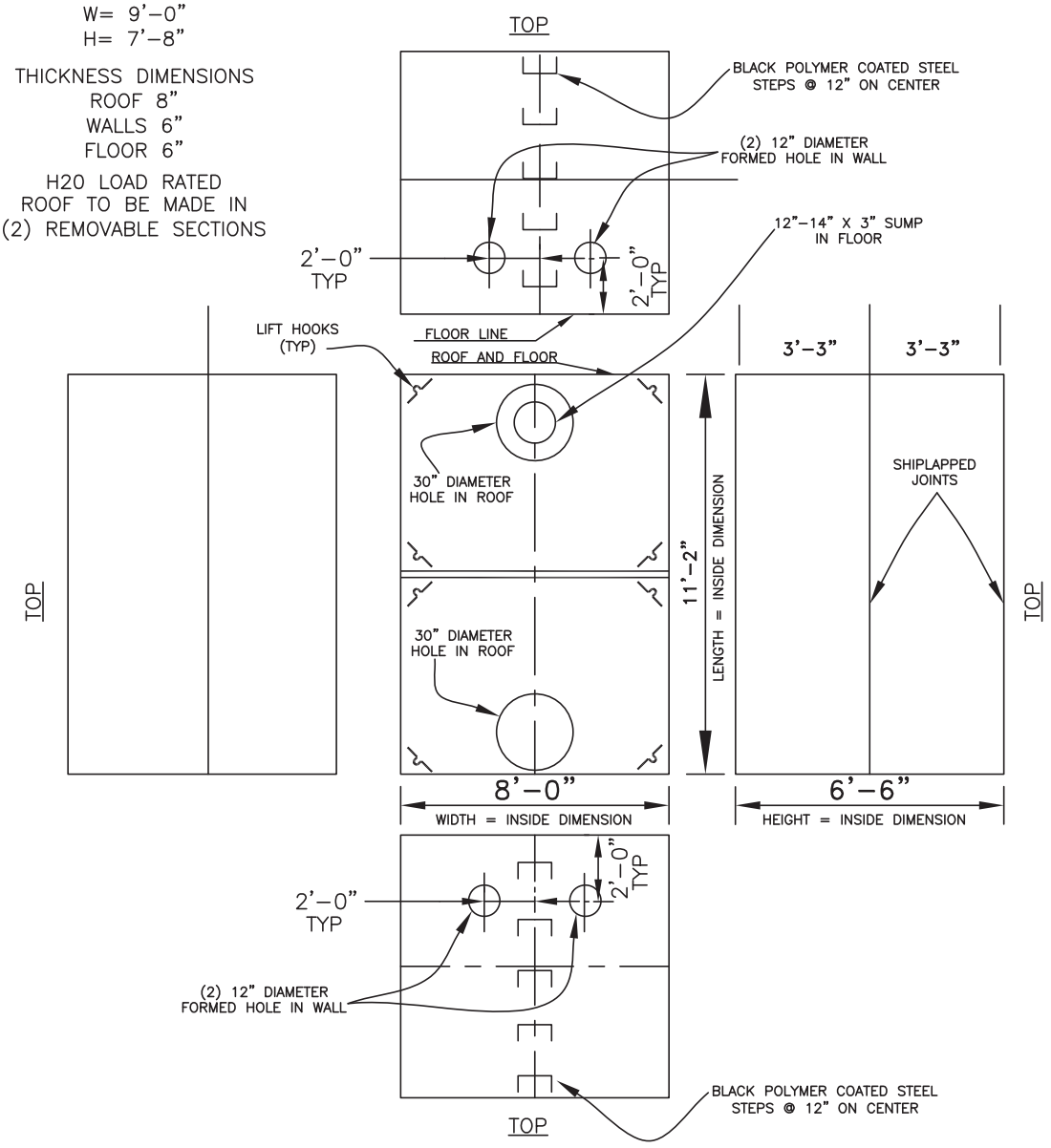
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W–13.2 – W–13.5).
3. FORMED HOLES SHALL BE TAPPERED TOWARD THE INSIDE OF VAULT.
4. ALL JOINTS SHALL BE SHIPLAPPED AND GASKETS SHALL BE BUTYL RUBBER CONFORMING TO A.S.T.M. C990.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–13.2	REV. DATE
		9/18/18 DJP
	STANDARD METER VAULT FOR DUCTILE IRON WATER SERVICE PIPE	
	SCALE: NTS	

OUTSIDE DIMENSIONS
L= 12'–2"
W= 9'–0"
H= 7'–8"

THICKNESS DIMENSIONS
ROOF 8"
WALLS 6"
FLOOR 6"

H20 LOAD RATED
ROOF TO BE MADE IN
(2) REMOVABLE SECTIONS



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W–13.2 – W–13.5).
3. FORMED HOLES SHALL BE TAPPERED TOWARD THE INSIDE OF VAULT.
4. ALL JOINTS SHALL BE SHIPLAPPED AND GASKETS SHALL BE BUTYL RUBBER CONFORMING TO A.S.T.M. C990.

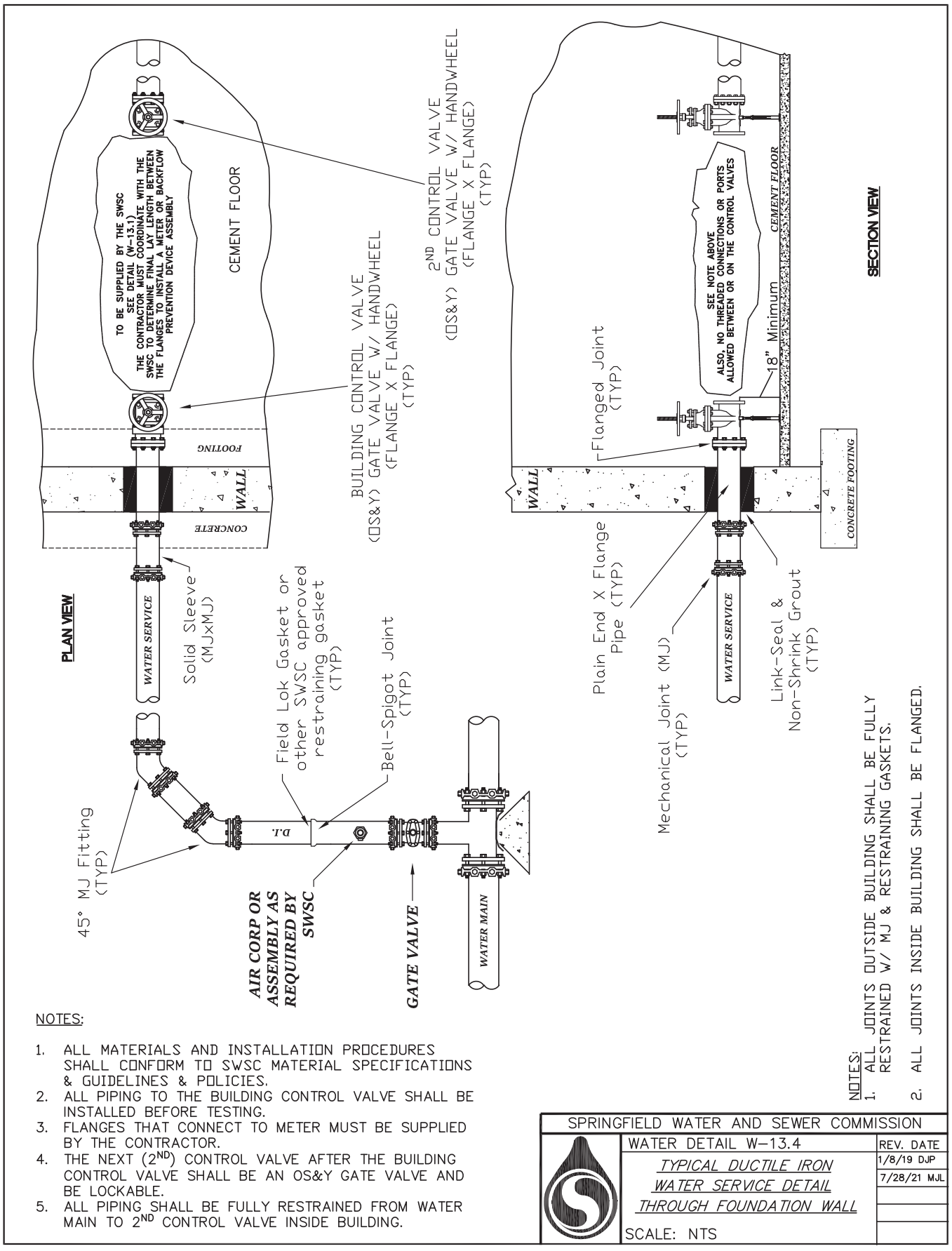
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W–13.3

OVERSIZED METER VAULT FOR DUCTILE IRON WATER SERVICE PIPE

SCALE: NTS

REV. DATE
4/1/08 MAB
1/8/19 DJP



NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. FLANGES THAT CONNECT TO METER MUST BE SUPPLIED BY THE CONTRACTOR.
4. THE NEXT (2ND) CONTROL VALVE AFTER THE BUILDING CONTROL VALVE SHALL BE AN OS&Y GATE VALVE AND BE LOCKABLE.
5. ALL PIPING SHALL BE FULLY RESTRAINED FROM WATER MAIN TO 2ND CONTROL VALVE INSIDE BUILDING.

NOTES:
1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

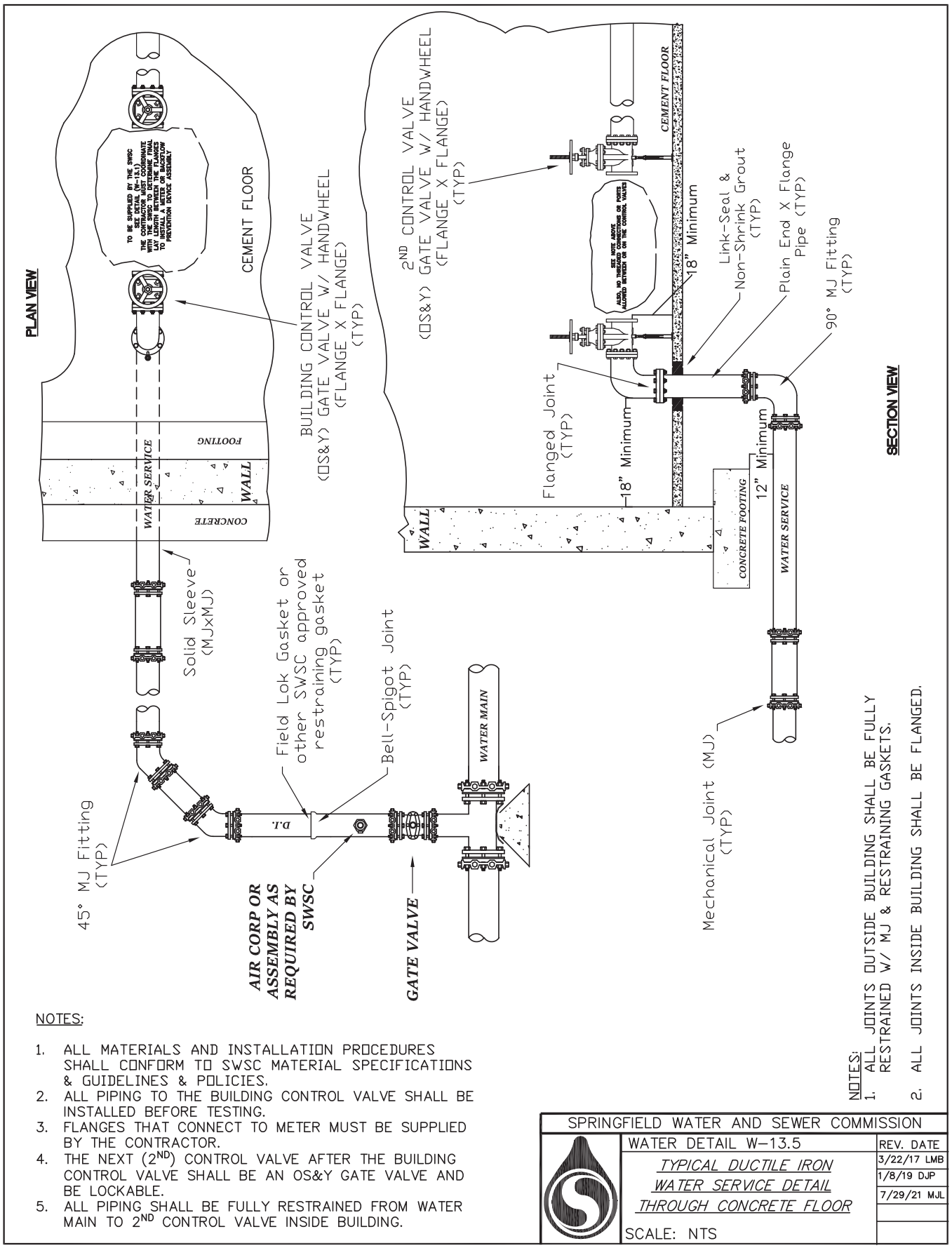
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.4

TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH FOUNDATION WALL

SCALE: NTS

REV. DATE
1/8/19 DJP
7/28/21 MJL



NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. FLANGES THAT CONNECT TO METER MUST BE SUPPLIED BY THE CONTRACTOR.
4. THE NEXT (2ND) CONTROL VALVE AFTER THE BUILDING CONTROL VALVE SHALL BE AN OS&Y GATE VALVE AND BE LOCKABLE.
5. ALL PIPING SHALL BE FULLY RESTRAINED FROM WATER MAIN TO 2ND CONTROL VALVE INSIDE BUILDING.

NOTES:
1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

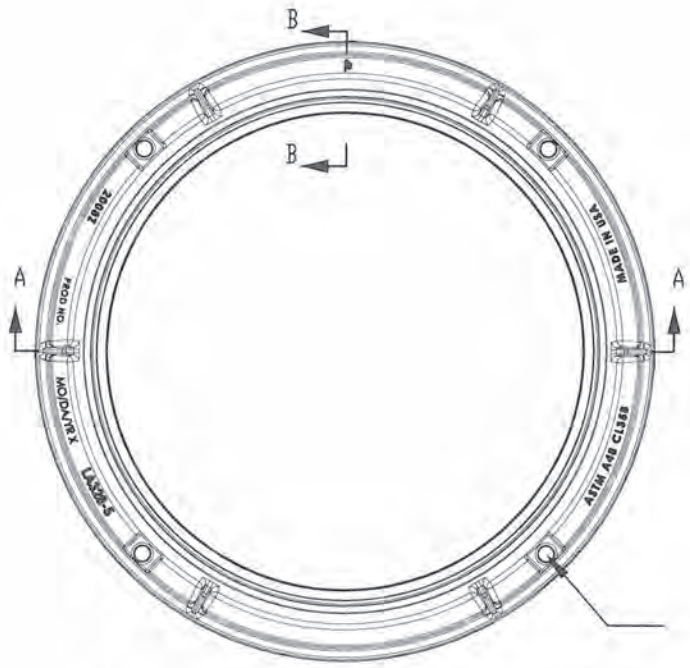
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.5

TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH CONCRETE FLOOR

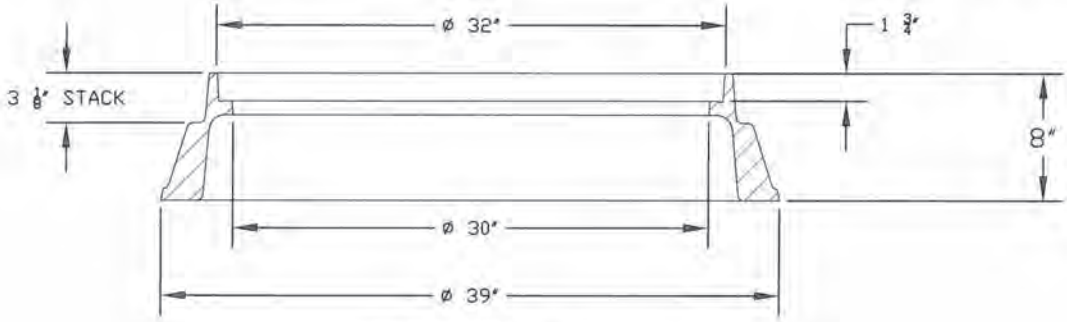
SCALE: NTS

REV. DATE
3/22/17 LMB
1/8/19 DJP
7/29/21 MJL



SECTION B-B

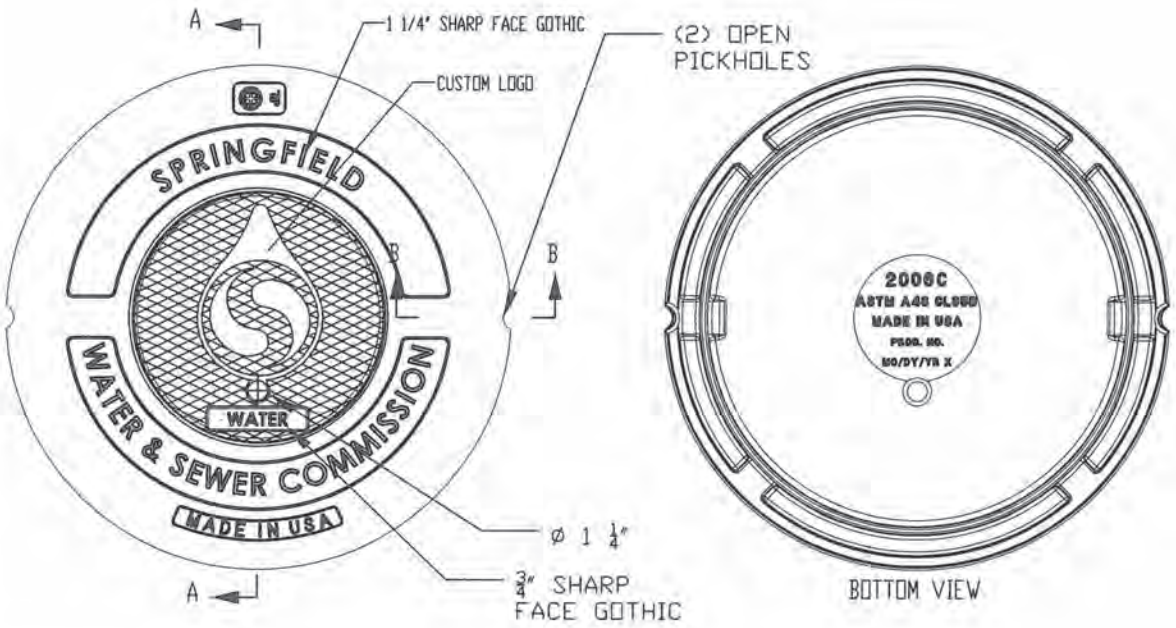
(4) 1" DIA HOLES EQUALLY SPACED ON 36" B.C.

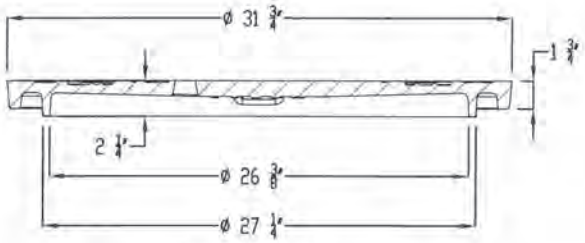


SECTION A-A

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.6	REV. DATE 4/16/19 DJP
	32-inch by 8-inch Frame Only	
	SCALE: NTS	



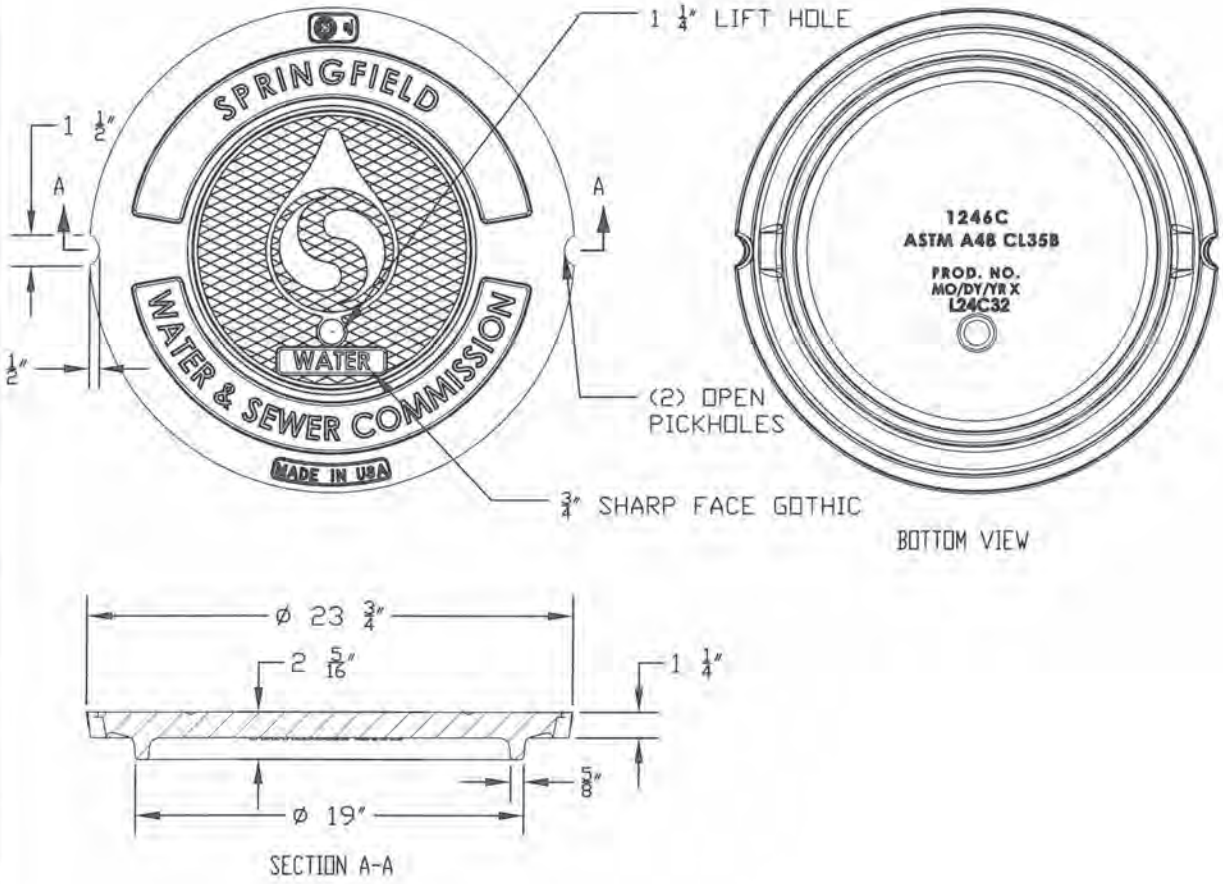


SECTION A-A

SECTION B-B
SCALE 1 : 8

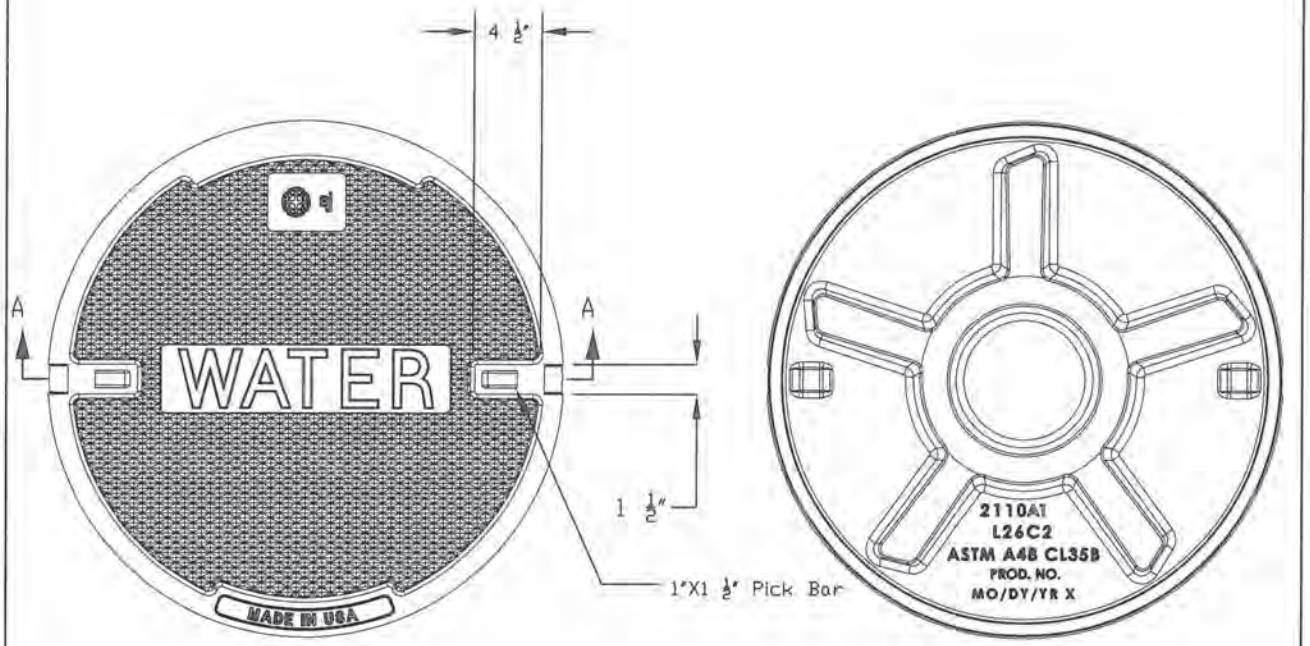
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.7	REV. DATE
	32-inch Standard Water Cover	4/16/19 DJP
	SCALE: NTS	

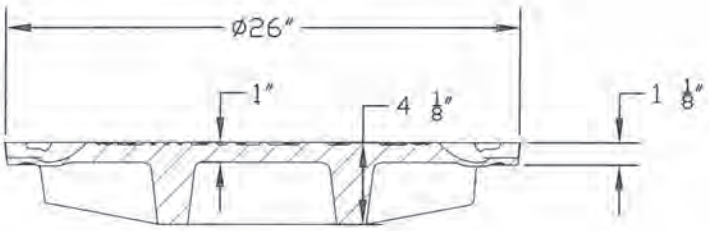


NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.8	REV. DATE
	24-inch Replacement Water Cover	4/16/19 DJP
	SCALE: NTS	



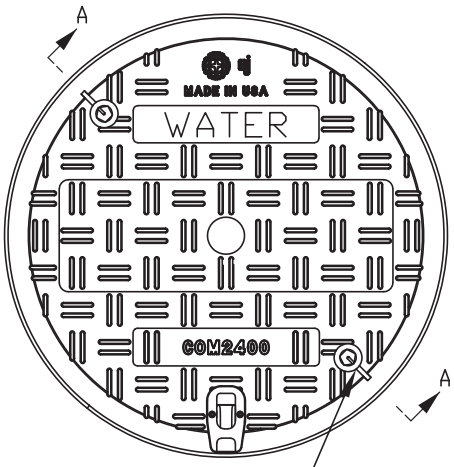
BOTTOM VIEW

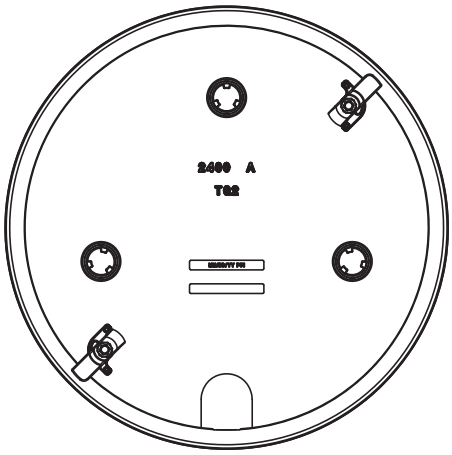


SECTION A-A

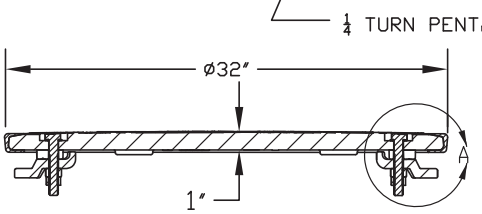
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.9	REV. DATE
	26-Inch Replacement Water Cover	4/16/19 DJP
	SCALE: NTS	

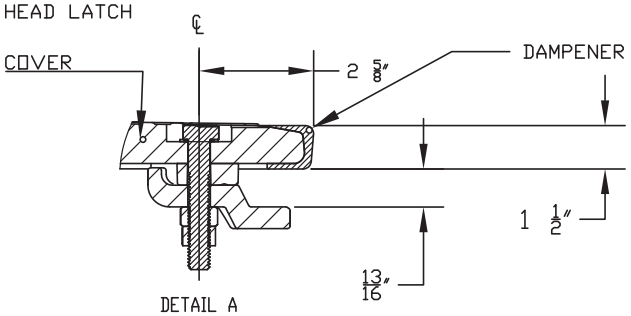




BOTTOM VIEW



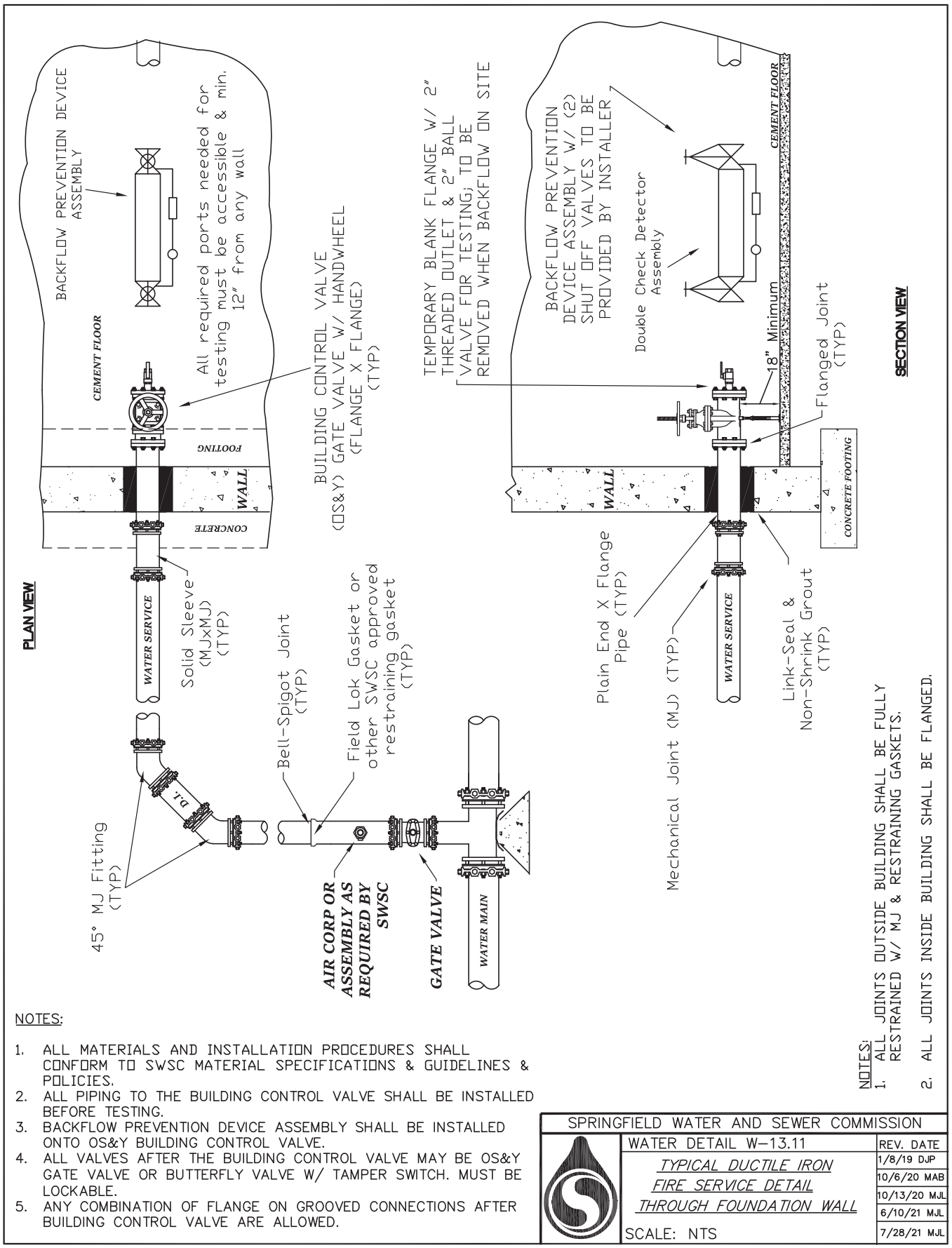
SECTION A-A



DETAIL A
SCALE 1:3

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. COVER SHALL BE MADE FROM FIBER REINFORCED POLYMER (FRP) ASTM C1028
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12″ AND AN ADDITIONAL +/- 1/16″ PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.10	REV. DATE
	32″ Composite Locking Cover	4/19/19 DJP
		4/6/21 MJL
	SCALE: NTS	



NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. BACKFLOW PREVENTION DEVICE ASSEMBLY SHALL BE INSTALLED ONTO OS&Y BUILDING CONTROL VALVE.
4. ALL VALVES AFTER THE BUILDING CONTROL VALVE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.
5. ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS AFTER BUILDING CONTROL VALVE ARE ALLOWED.

NOTES:
1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

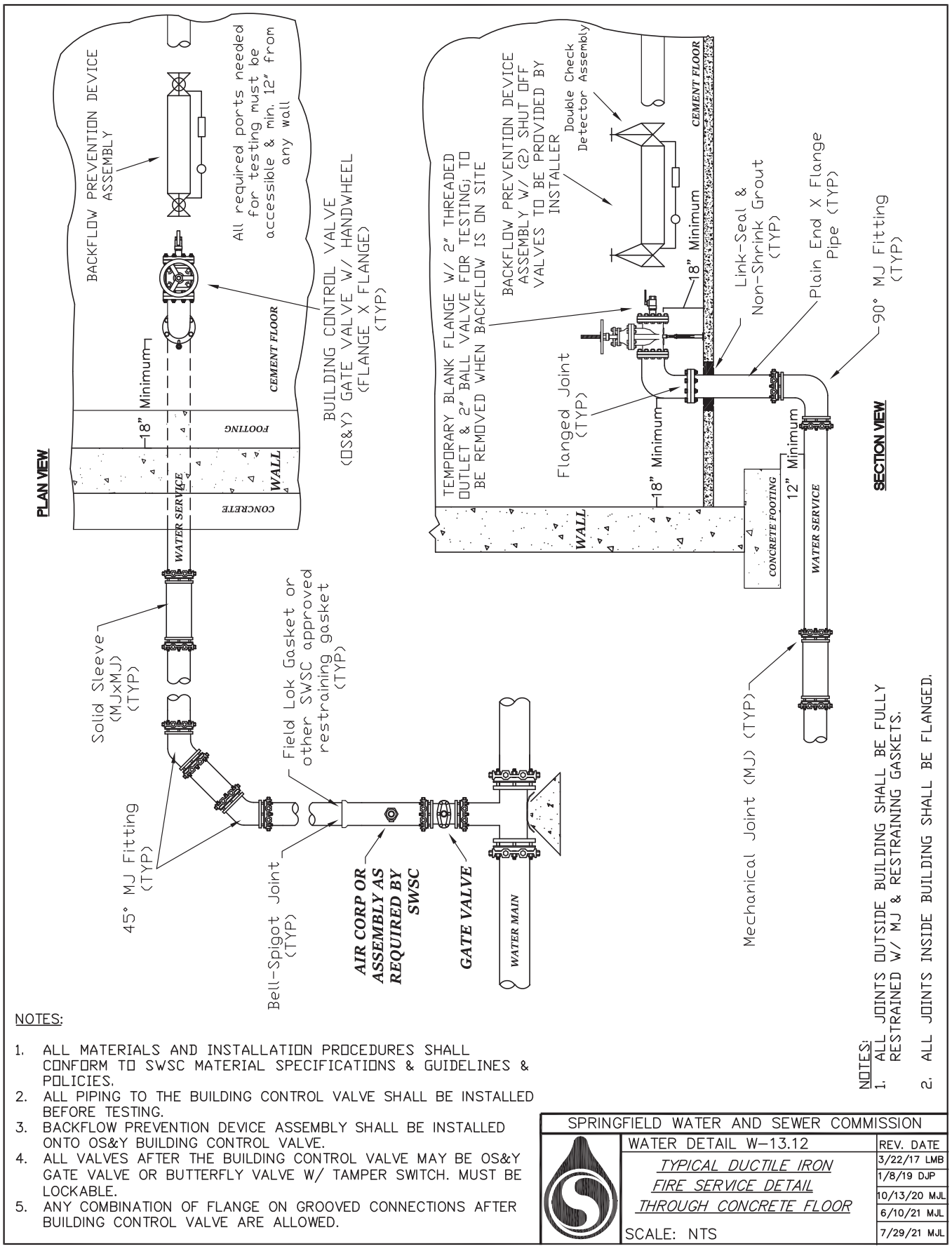
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.11

TYPICAL DUCTILE IRON FIRE SERVICE DETAIL THROUGH FOUNDATION WALL

SCALE: NTS

REV. DATE
1/8/19 DJP
10/6/20 MAB
10/13/20 MJL
6/10/21 MJL
7/28/21 MJL



NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. BACKFLOW PREVENTION DEVICE ASSEMBLY SHALL BE INSTALLED ONTO OS&Y BUILDING CONTROL VALVE.
4. ALL VALVES AFTER THE BUILDING CONTROL VALVE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.
5. ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS AFTER BUILDING CONTROL VALVE ARE ALLOWED.

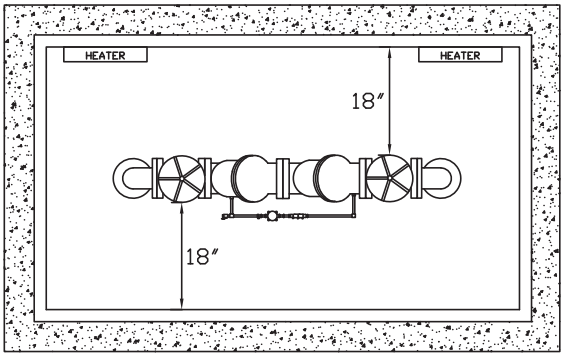
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.12

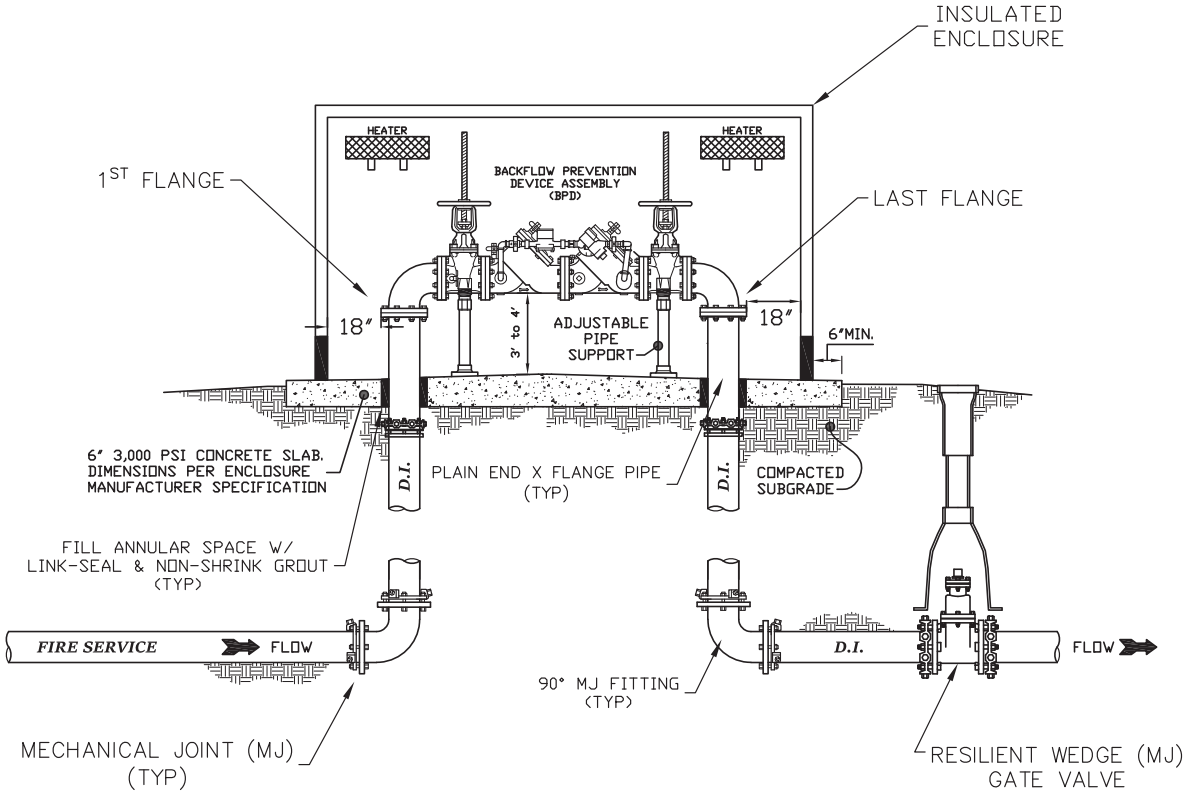
TYPICAL DUCTILE IRON FIRE SERVICE DETAIL THROUGH CONCRETE FLOOR

SCALE: NTS

REV. DATE
3/22/17 LMB
1/8/19 DJP
10/13/20 MJL
6/10/21 MJL
7/29/21 MJL



PLAN VIEW

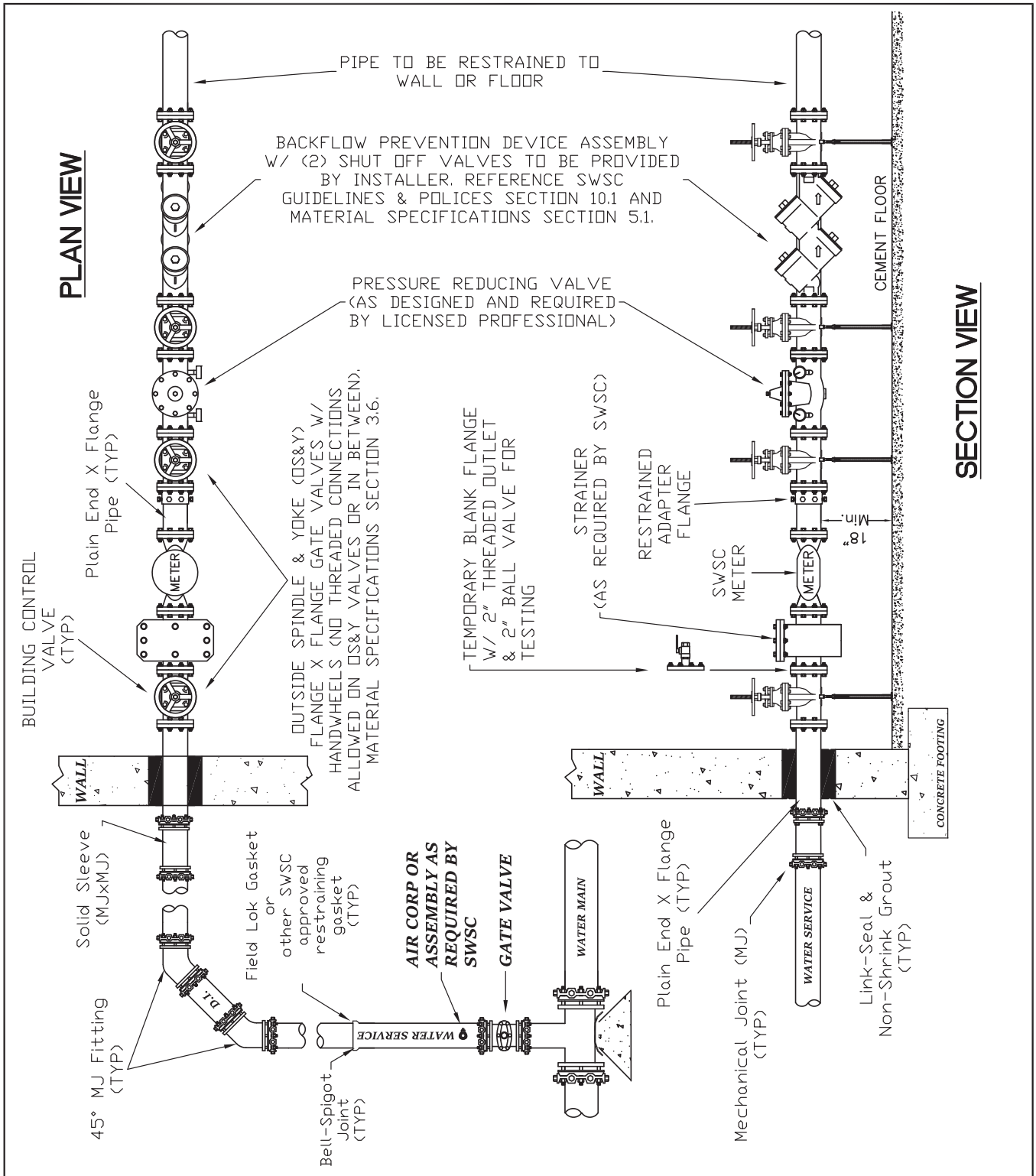


SECTION VIEW

NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
2. ALL PIPING FROM MAIN TO THE 1ST FLANGE MUST BE INSTALLED BEFORE TESTING.
3. ALL VALVES AFTER THE 1ST FLANGE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.
4. ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS BETWEEN 1ST FLANGE AND LAST FLANGE ARE ALLOWED.
5. ALL PIPING FROM MAIN TO LAST FLANGE, SHALL BE RESTRAINED.
6. BELL/SPIGOT PIPE JOINTS SHALL BE RESTRAINED BY FIELD LOK GASKET OR OTHER SWSC APPROVED RESTRAINING GASKET.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–13.13	REV. DATE
	TYPICAL DUCTILE IRON FIRE SERVICE DETAIL IN A HOT BOX	10/28/20 MJL
		10/29/20 DS
		8/2/21 MJL
	SCALE: NTS	



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. ALL PIPING SHALL BE FULLY RESTRAINED FROM MAIN TO INSIDE BUILDING.
4. ALL JOINTS INSIDE BUILDING SHALL BE FLANGE.

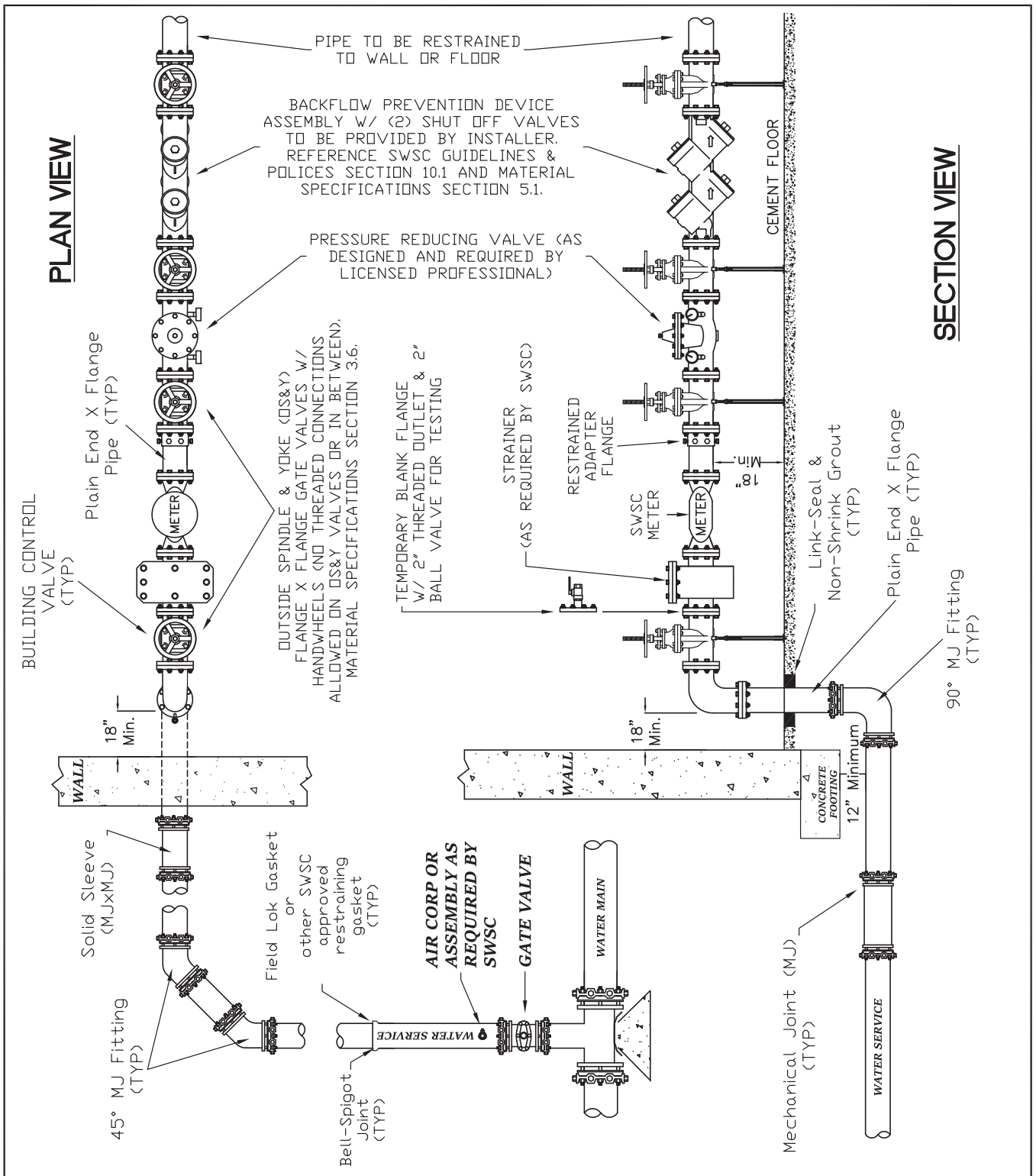
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.14

TYPICAL DIP COMMERCIAL & INDUSTRIAL SERVICE DETAIL THROUGH FOUNDATION WALL

SCALE: NTS

REV. DATE
10/28/20 DS
11/5/20 DS
7/28/21 MJL



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. ALL PIPING SHALL BE FULLY RESTRAINED FROM MAIN TO INSIDE BUILDING.
4. ALL JOINTS INSIDE BUILDING SHALL BE FLANGE.

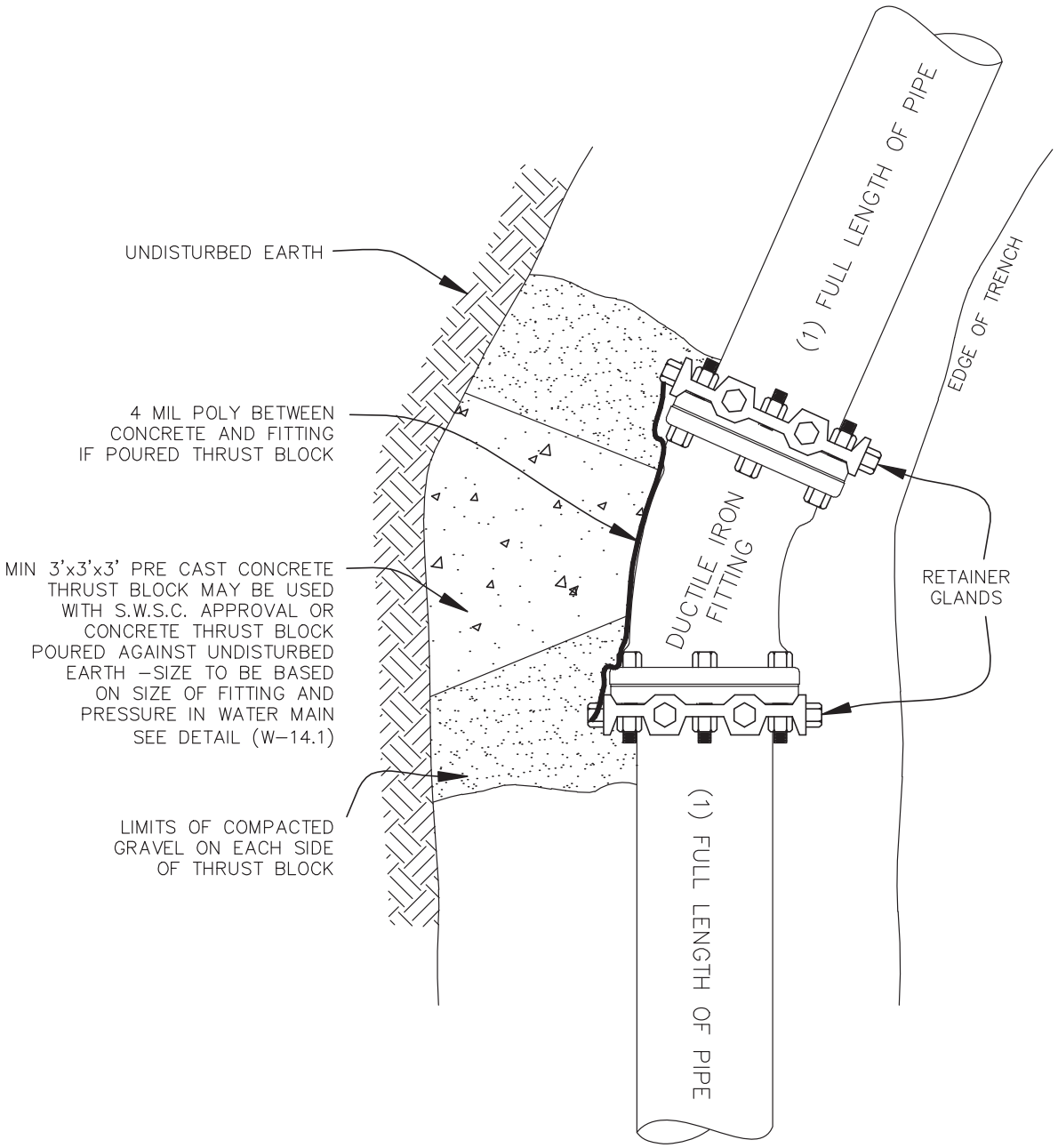
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.15

TYPICAL DIP COMMERCIAL & INDUSTRIAL SERVICE DETAIL THROUGH CONCRETE FLOOR

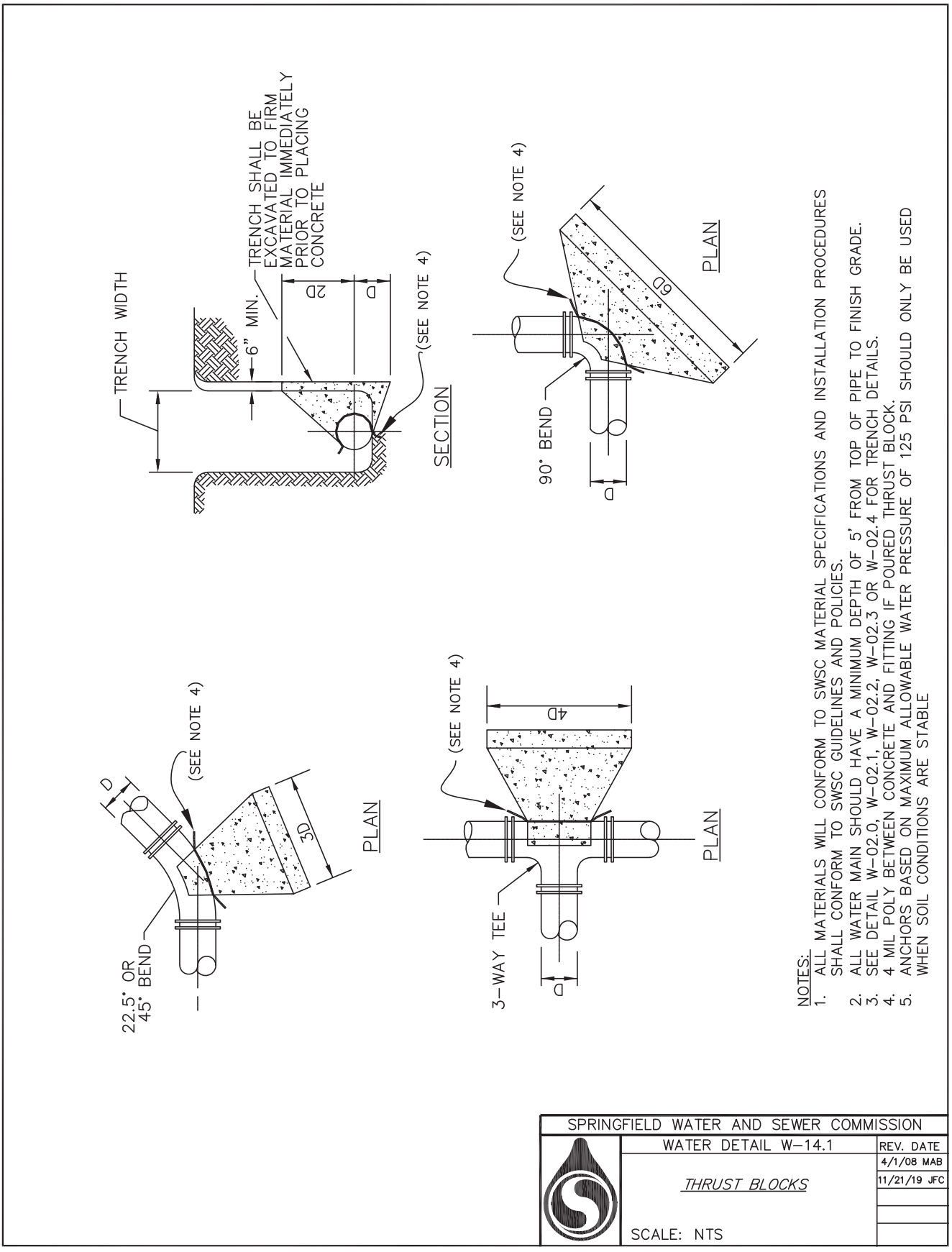
SCALE: NTS

REV. DATE
10/29/20 DS
11/5/20 DS
7/29/21 MJL



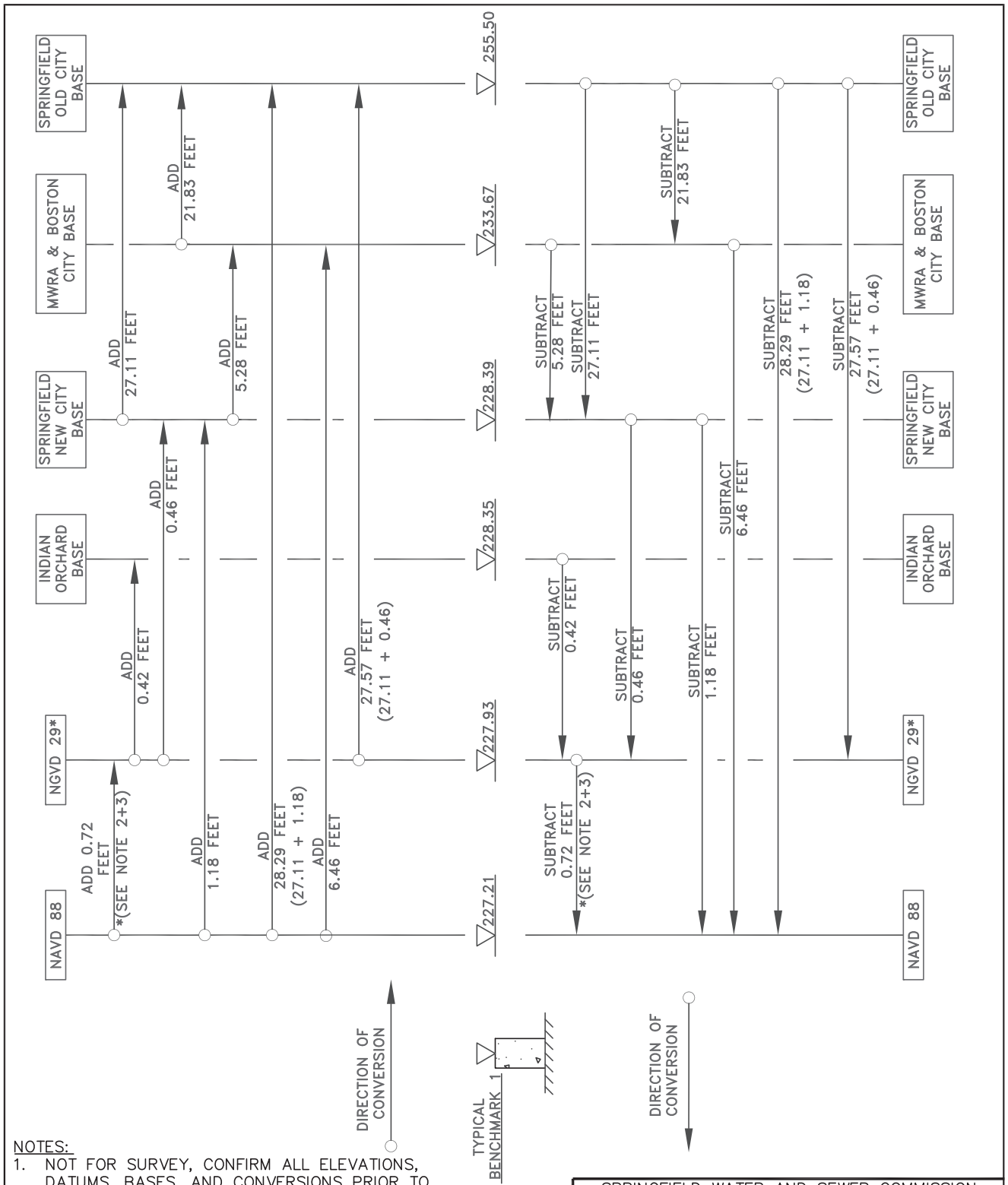
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W–02.0, W–02.1, W–02.2, W–02.3 OR W–02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–14.0	REV. DATE
		4/1/08 MAB
	THRUST BLOCK BEHIND FITTINGS	
	SCALE: NTS	



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. 4 MIL POLY BETWEEN CONCRETE AND FITTING IF POURED THRUST BLOCK.
5. ANCHORS BASED ON MAXIMUM ALLOWABLE WATER PRESSURE OF 125 PSI SHOULD ONLY BE USED WHEN SOIL CONDITIONS ARE STABLE

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-14.1	REV. DATE
		4/1/08 MAB
	THRUST BLOCKS	11/21/19 JFC
	SCALE: NTS	



NOTES:
1. NOT FOR SURVEY, CONFIRM ALL ELEVATIONS, DATUMS, BASES, AND CONVERSIONS PRIOR TO SURVEY WORK
2. * NGVD 29 IS NOT ALWAYS THE SAME ELEVATION, NGVD 29 IS DEPENDENT ON LOCATION IN SPRINGFIELD, LUDLOW, WESTFIELD, ETC. THE ELEVATION OF NGVD 29 CAN BE 0.65 – 0.72.
3. ROUND TO THE HUNDREDTHS UPON CONVERSION COMPLETION

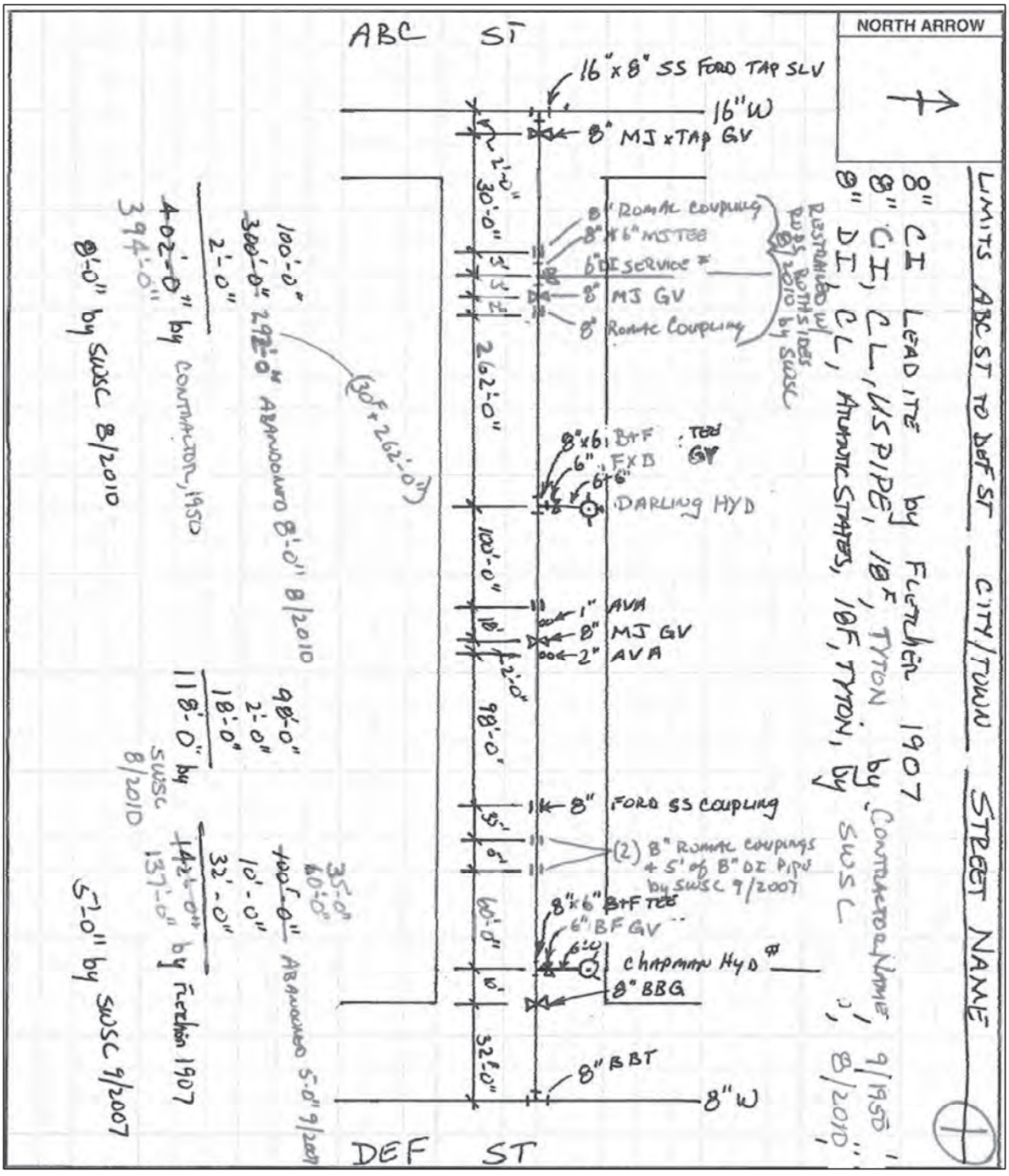
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W–15.0

RELATION OF VERTICAL DATUMS TO SPRINGFIELD CITY BASE(S)

SCALE: NTS

REV. DATE
_/_/17 MAB
1/9/19 DJP



NOTES:
1.

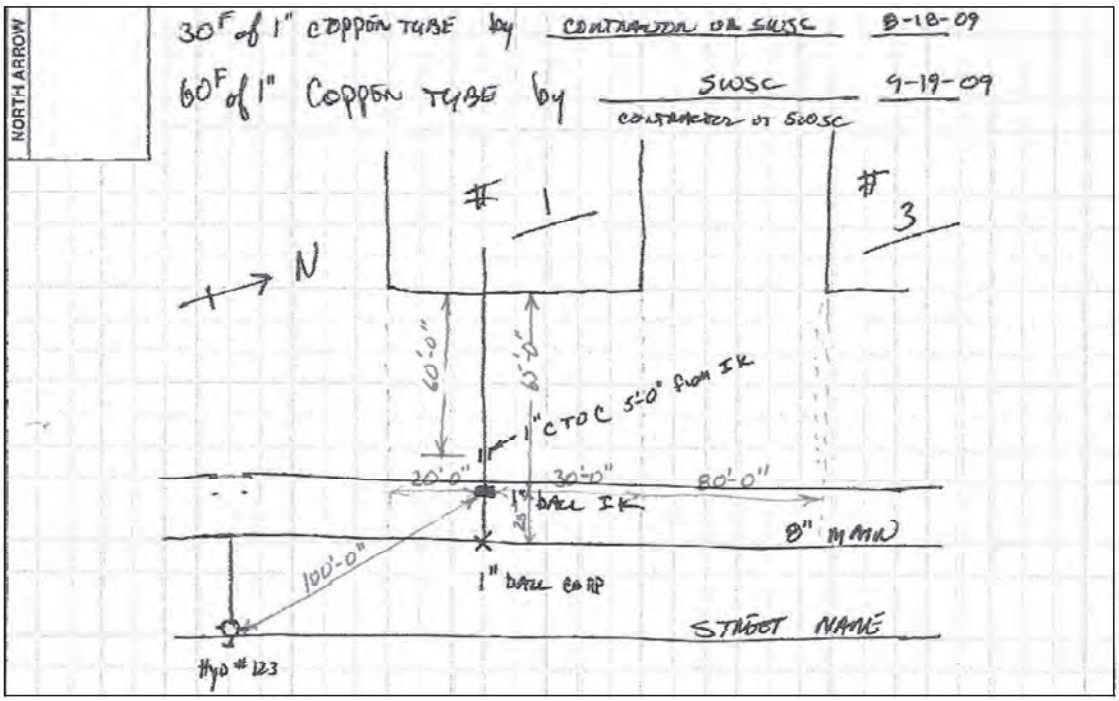
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W–16.0	REV. DATE 10/19/17 DJP
	RECORD SKETCH DETAIL	
	SCALE: NTS	

NO: STREET

OWNER S. R.

DATE	WORK DONE
8-18-09	SERVICE REPLACED BY CONTRACTOR MAIN TO TRUEBOLT
7-19-09	SERVICE EXTRA REQUIRED BY SWSC TRUEBOLT TO HOUSE

BUFFALO BOX IN TRUEBOLT OVER 1" BALL IK
65'-0" OUT FROM HOUSE
20'-0 N OF S LINE OF HOUSE
30'-0" S OF N LINE OF HOUSE
80'-0" S OF S LINE of house # 3
ANOTHER BUFFALO BOX IS BURIED IN STREET OVER
1" BALL CORP 25'-0" E OF IK
1" C TO C IS 5'-0" from IK & 60'-0" OUT FROM HOUSE



NOTES:
1.

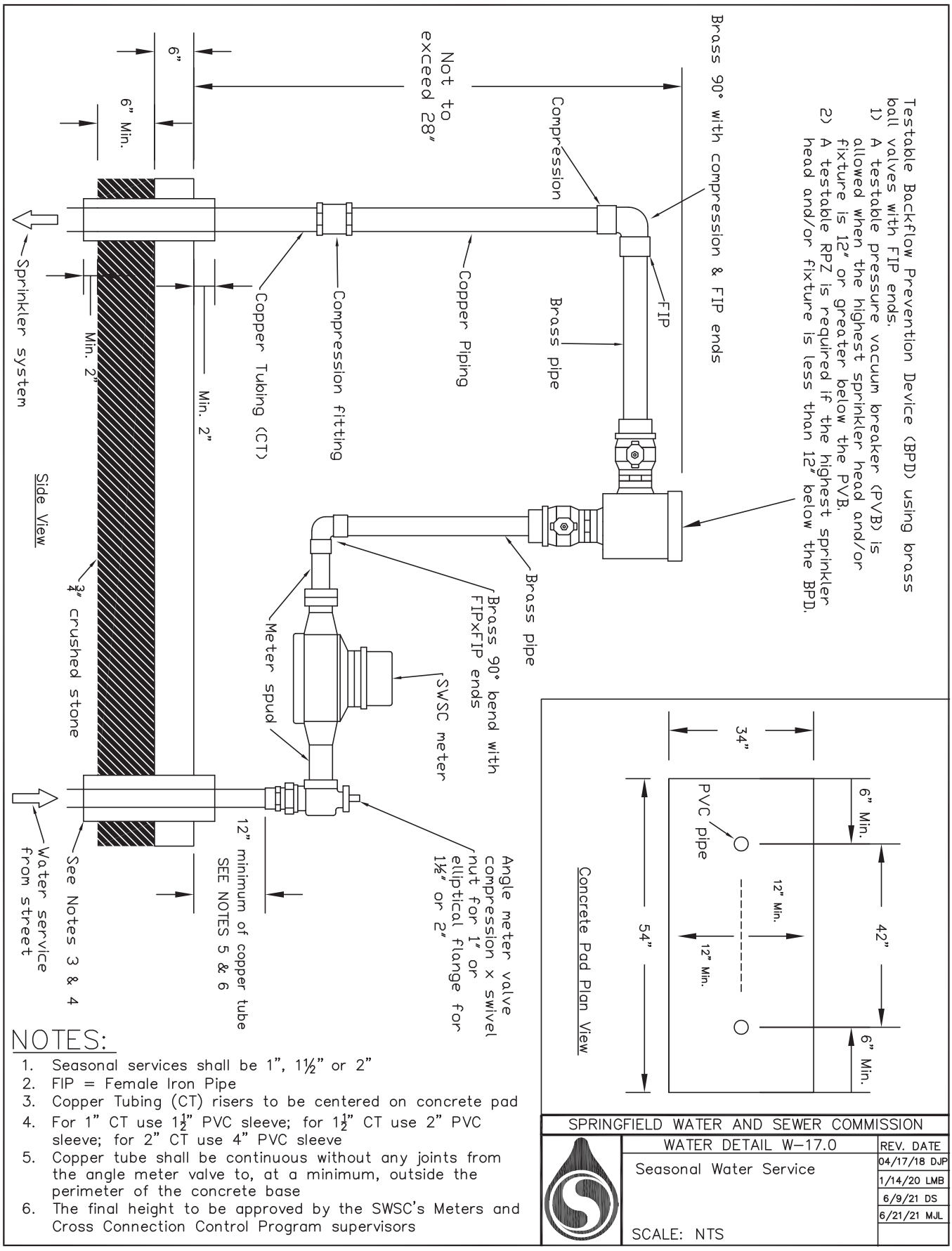
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W–16.1

WATER SERVICES CARD DETAIL

SCALE: NTS

REV. DATE
10/19/17 DJP

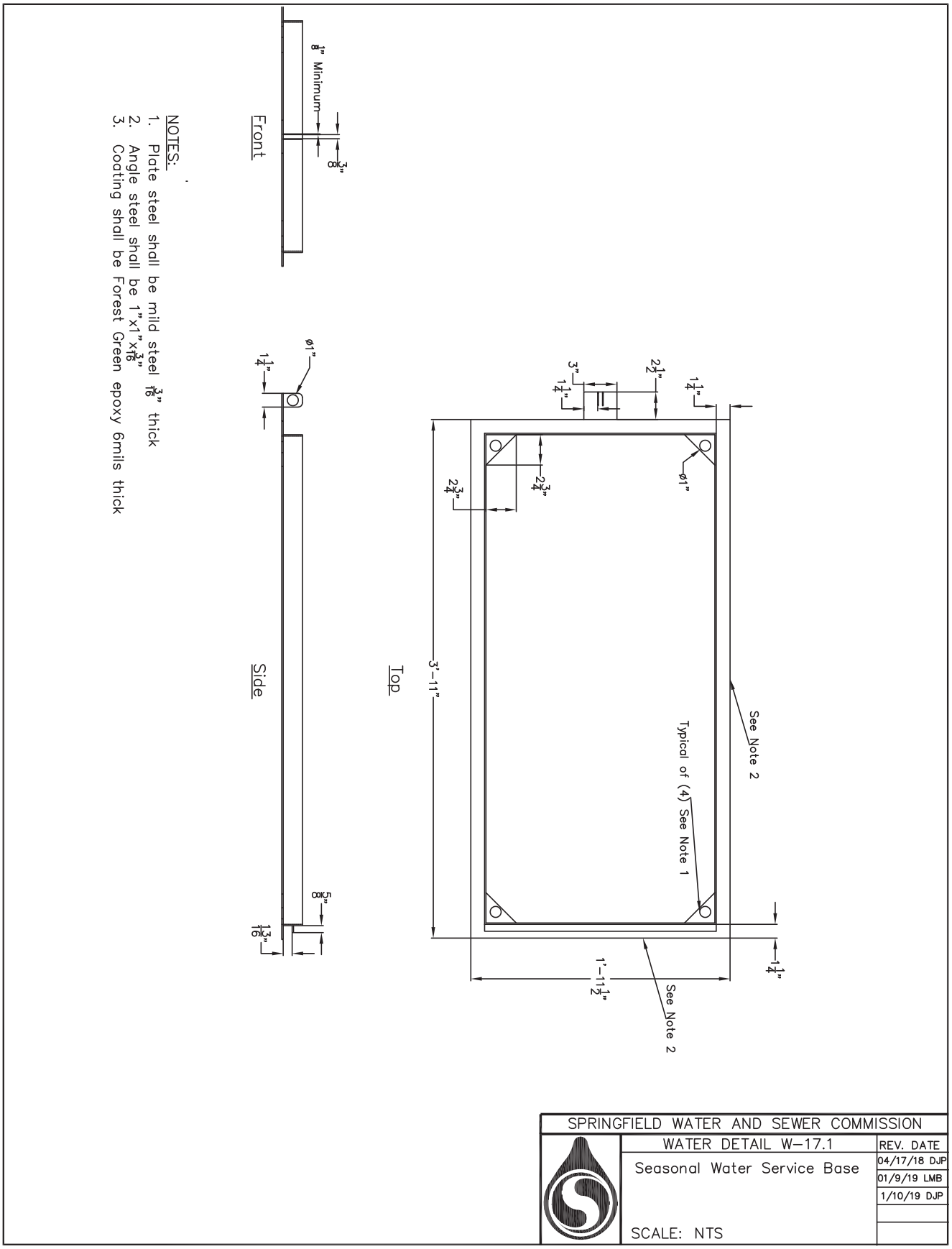


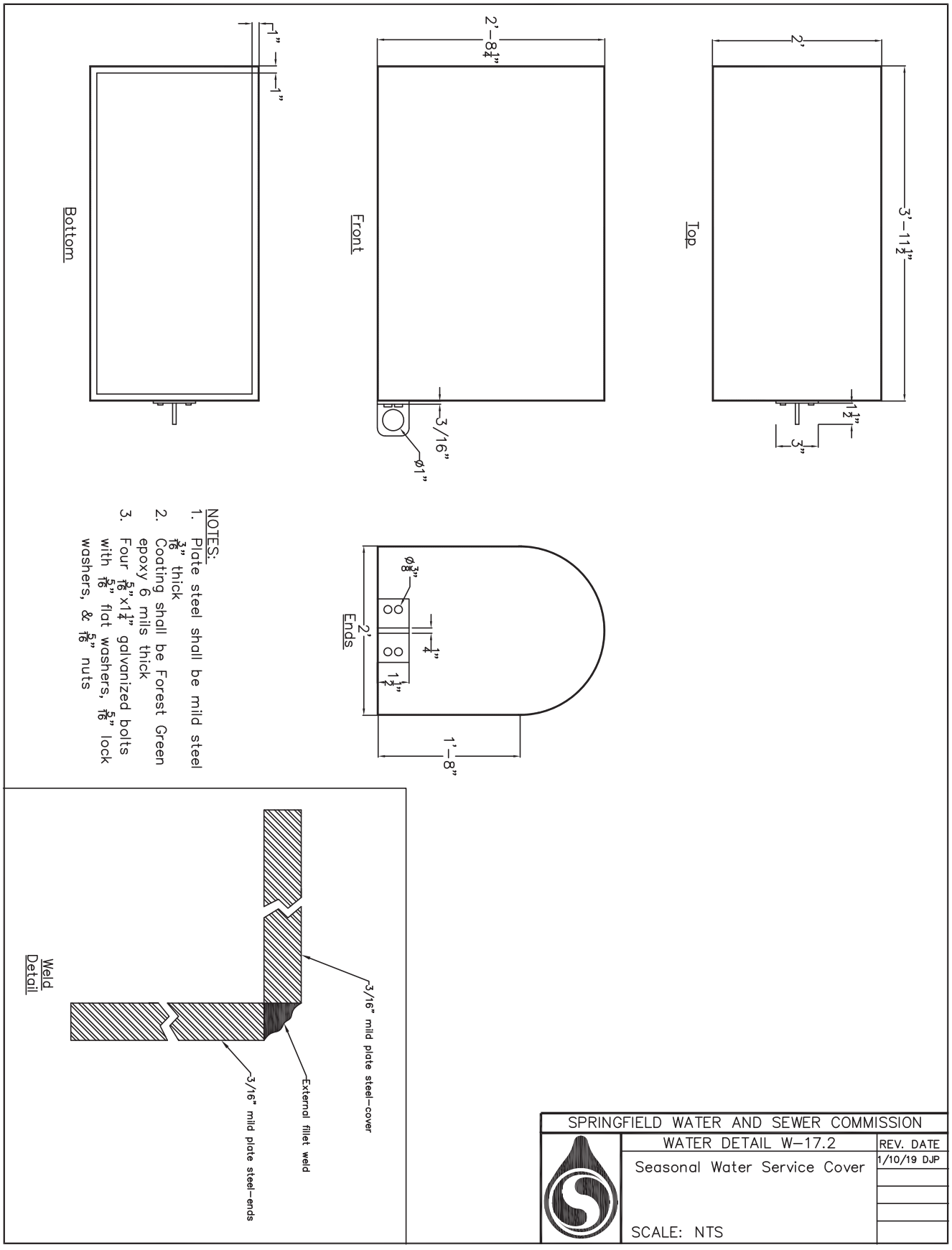
NOTES:

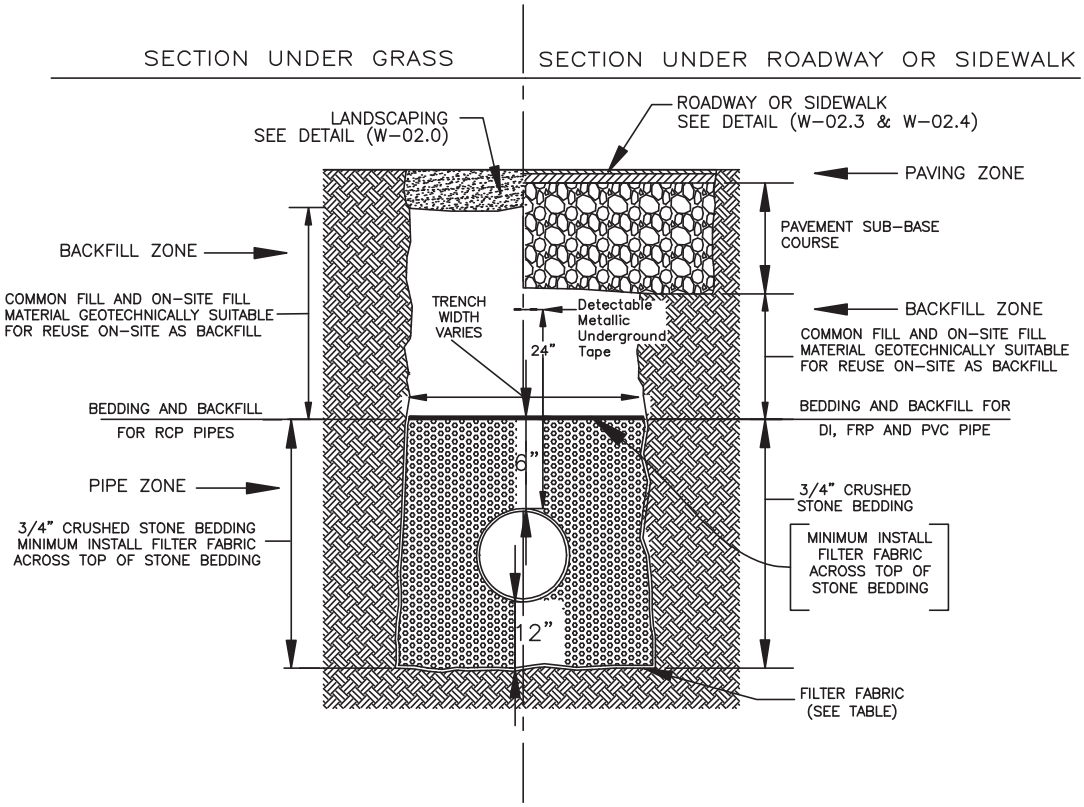
1. Seasonal services shall be 1", 1½" or 2"
2. FIP = Female Iron Pipe
3. Copper Tubing (CT) risers to be centered on concrete pad
4. For 1" CT use 1½" PVC sleeve; for 1½" CT use 2" PVC sleeve; for 2" CT use 4" PVC sleeve
5. Copper tube shall be continuous without any joints from the angle meter valve to, at a minimum, outside the perimeter of the concrete base
6. The final height to be approved by the SWSC's Meters and Cross Connection Control Program supervisors

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-17.0	REV. DATE
Seasonal Water Service	04/17/18 DJP
	1/14/20 LMB
	6/9/21 DS
	6/21/21 MJL
SCALE: NTS	


Front
1" Minimum
3/8"
Side
Ø1"
1 1/4"
5/8"
13/16"
Top
3'-11"
2 1/2"
3"
1 1/4"
1 1/4"
2 3/4"
2 3/4"
Ø1"
See Note 2
Typical of (4) See Note 1
1'-11 1/2"
See Note 2
NOTES:
1. Plate steel shall be mild steel 3/16" thick
2. Angle steel shall be 1"x1"x3/16"
3. Coating shall be Forest Green epoxy 6mils thick
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-17.1
Seasonal Water Service Base
SCALE: NTS
REV. DATE
04/17/18 DJP
01/9/19 LMB
1/10/19 DJP


Top
2'
3'-11½"
1½"
3"
Front
2'-8¼"
3/16"
ø1"
Bottom
1"
1"
2'
Ends
ø⅜"
¼"
1½"
1'-8"
NOTES:
1. Plate steel shall be mild steel 3/16" thick
2. Coating shall be Forest Green epoxy 6 mils thick
3. Four 5/16"x1¼" galvanized bolts with 5/16" flat washers, 5/16" lock washers, & 5/16" nuts
Weld Detail
3/16" mild plate steel-cover
External fillet weld
3/16" mild plate steel-ends
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-17.2
Seasonal Water Service Cover
SCALE: NTS
REV. DATE
1/10/19 DJP



TOTAL STONE BEDDING WRAP
FILTER FABRIC REQUIREMENT

	SOIL TYPE	
	SILT OR CLAY	GRANULAR SOIL
ABOVE GROUND WATER	FILTER FABRIC NOT REQUIRED	FILTER FABRIC NOT REQUIRED
BELOW GROUND WATER	FILTER FABRIC REQUIRED	FILTER FABRIC NOT REQUIRED
2' OVERLAP MINIMUM OF FILTER FABRIC AT TOP OF BEDDING		

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION

SEWER DETAIL S-01.0

TRENCH DETAIL
FOR SEWER PIPES

SCALE: NTS

REV. DATE
4/1/08 MAB

ELEVATION

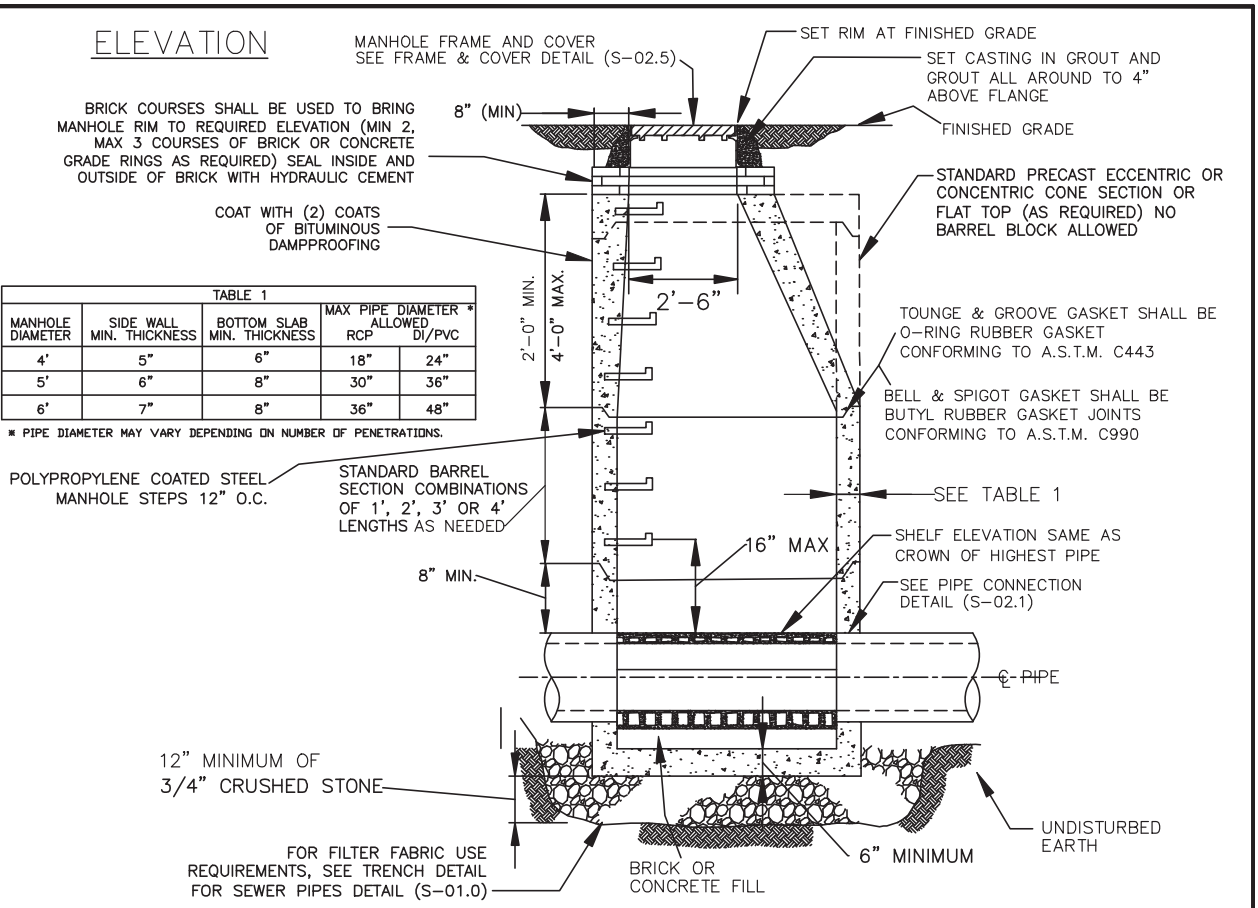
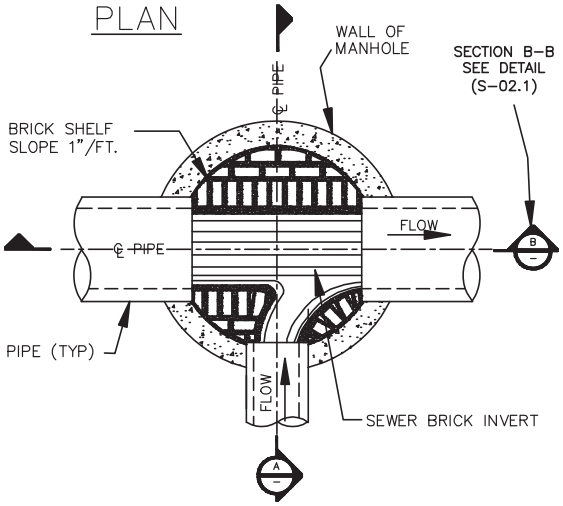


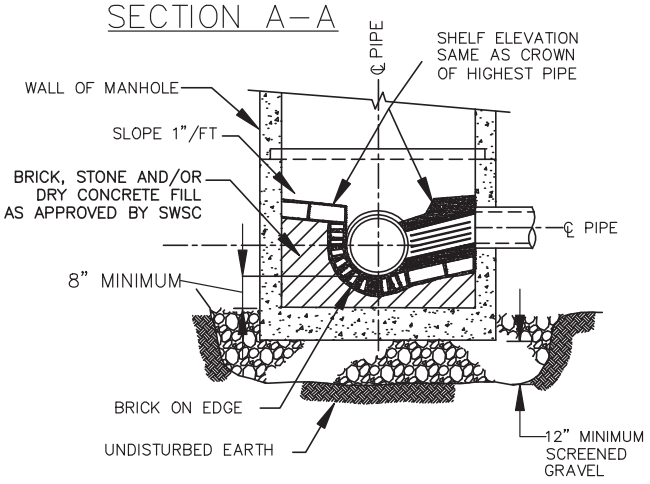
TABLE 1				
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER * ALLOWED RCP	DI/PVC
4'	5"	6"	18"	24"
5'	6"	8"	30"	36"
6'	7"	8"	36"	48"

* PIPE DIAMETER MAY VARY DEPENDING ON NUMBER OF PENETRATIONS.

PLAN



SECTION A-A



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SPRINGFIELD WATER AND SEWER COMMISSION

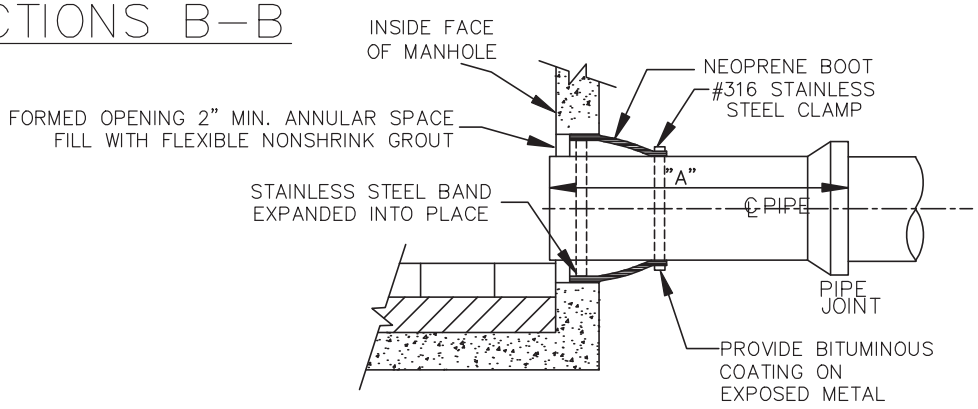
SEWER DETAIL S-02.0

PRE-CAST CONCRETE SEWER MANHOLE

SCALE: NTS

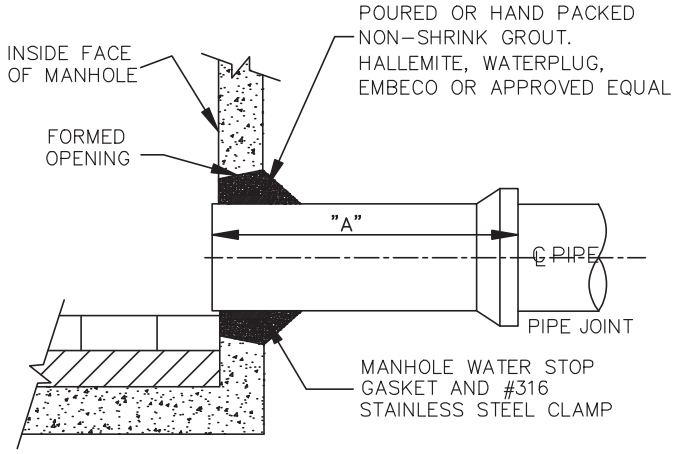
REV. DATE
4/1/08 MAB

SECTIONS B–B



FLEXIBLE MANHOLE SEAL

MAXIMUM STUB LENGTH		
PIPE MATERIAL	"A" (MAX.)	"A" (MIN.)
RC	4'–0"	2'–0"
PVC	3'–3"	2'–0"
DI	4'–6"	2'–0"



HYDRAULIC CEMENT SEAL*

*THIS METHOD REQUIRES SWSC APPROVAL

NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H–20 LOADING.
6. PRE–CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON–POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233–82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20–44, ACI 318–83; ASTM C478–82, C890–82, C913–71

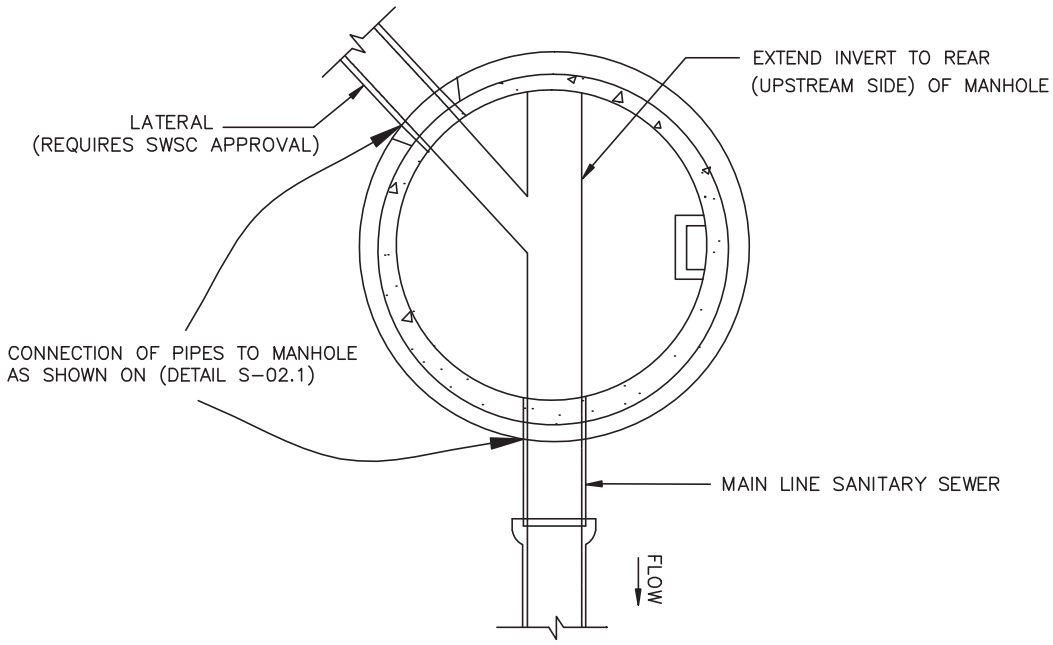
SPRINGFIELD WATER AND SEWER COMMISSION

SEWER DETAIL S–02.1

PRE–CAST CONCRETE SEWER PIPE CONNECTIONS

SCALE: NTS

REV. DATE
4/1/08 MAB



END MANHOLE

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.2	REV. DATE
		4/1/08 MAB
	END OF SEWER MAIN	
	SCALE: NTS	

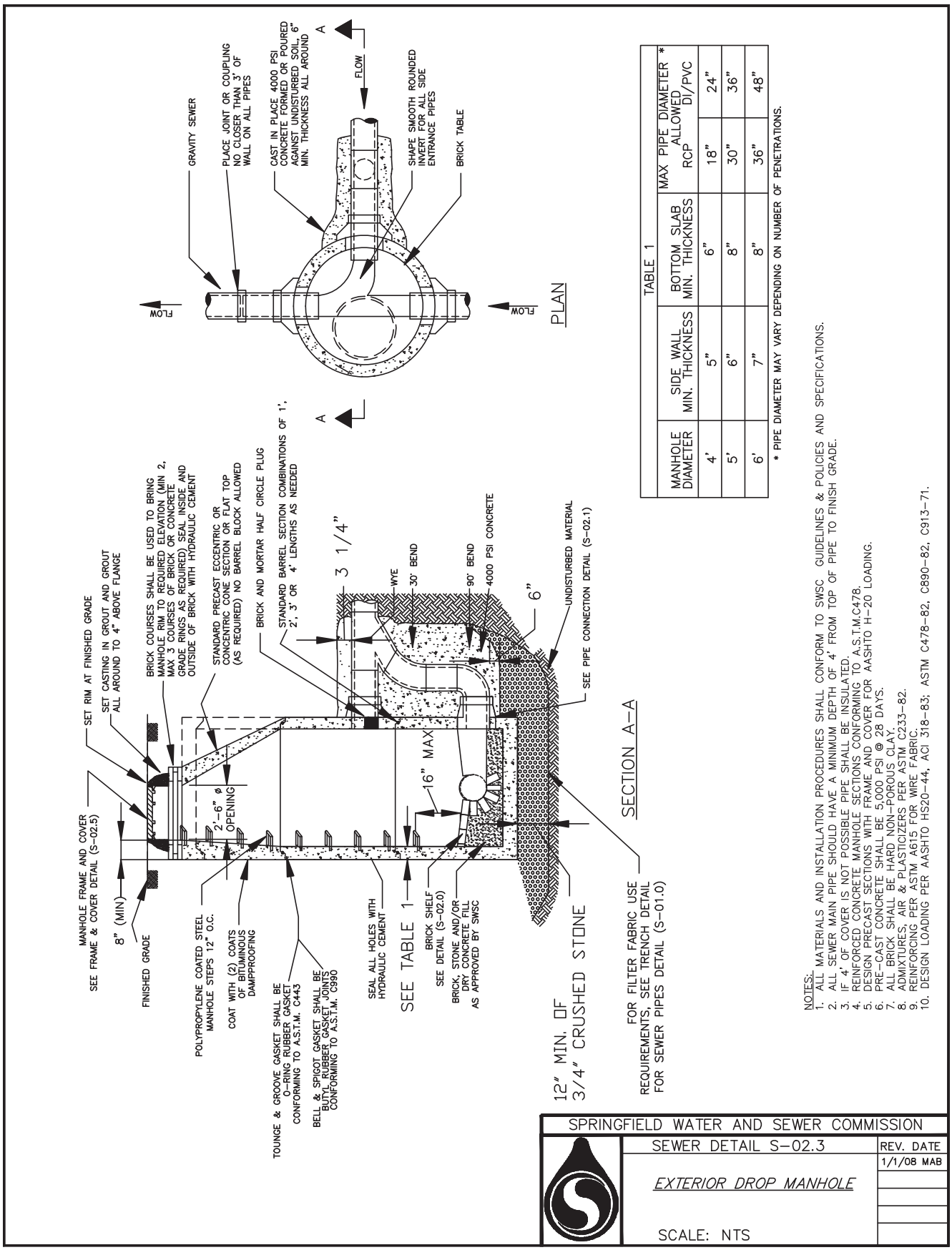


TABLE 1			
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER * ALLOWED RCP	DI/PVC
4'	5"	6"	18"	24"
5'	6"	8"	30"	36"
6'	7"	8"	36"	48"

* PIPE DIAMETER MAY VARY DEPENDING ON NUMBER OF PENETRATIONS.

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

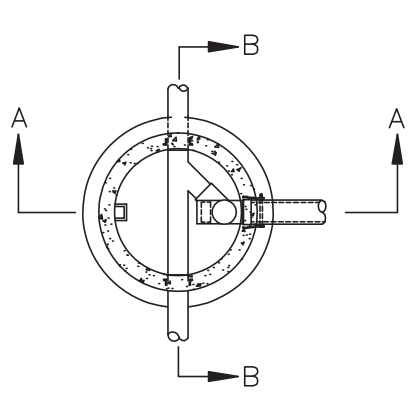
SPRINGFIELD WATER AND SEWER COMMISSION

SEWER DETAIL S-02.3

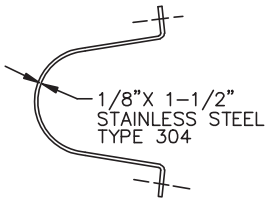
EXTERIOR DROP MANHOLE

SCALE: NTS

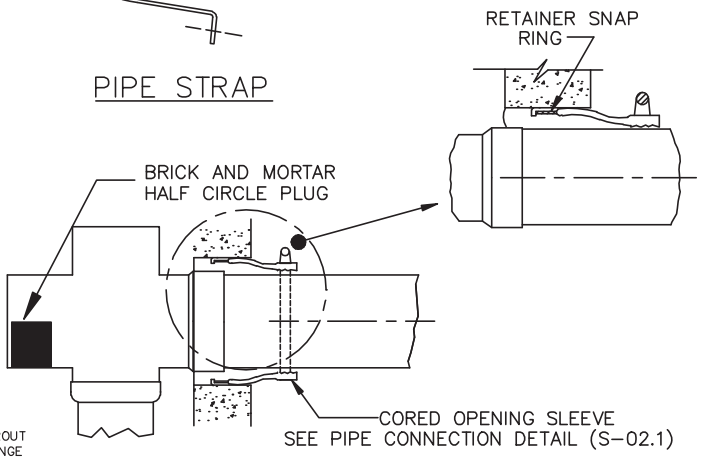
REV. DATE
1/1/08 MAB



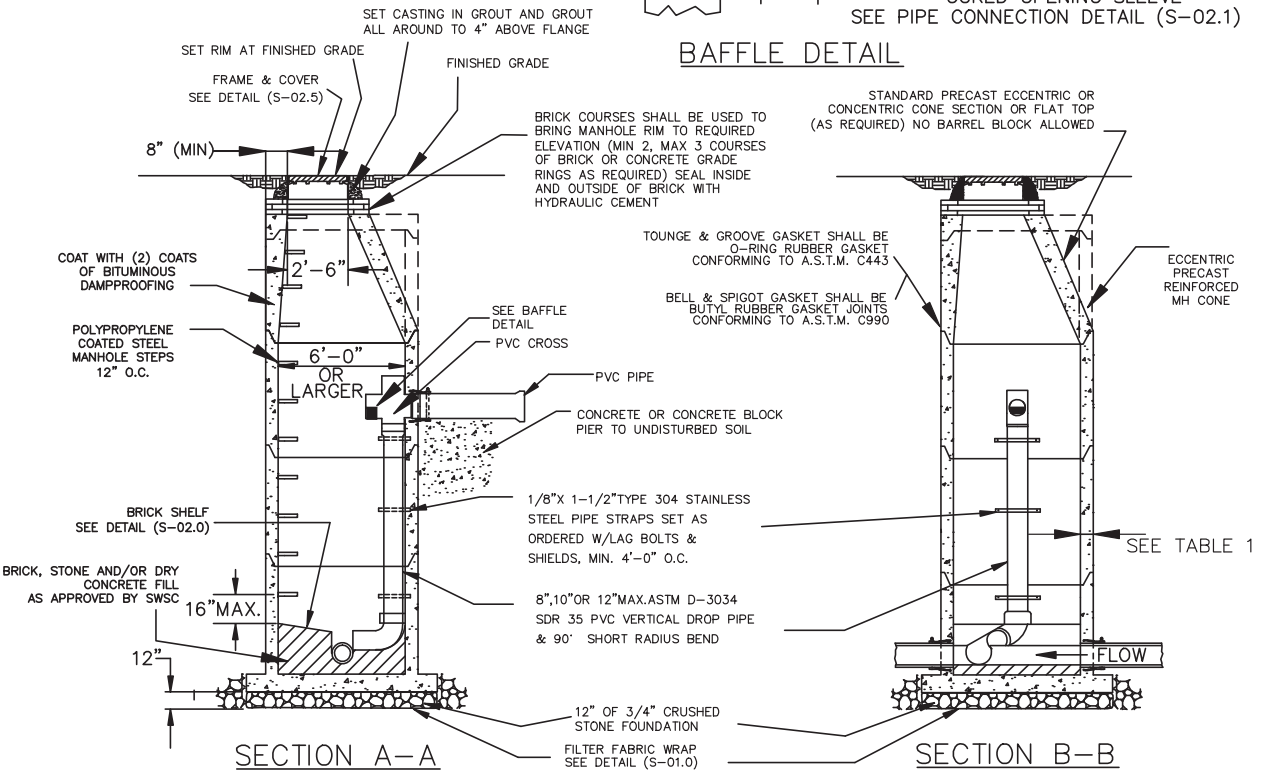
PLAN



PIPE STRAP



BAFFLE DETAIL



SECTION A-A

SECTION B-B

TABLE 1				
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER * ALLOWED RCP	DI/PVC
6'	7"	8"	18"	24"
6'	7"	8"	30"	36"
6'	7"	8"	36"	48"

* PIPE DIAMETER MAY VARY DEPENDING ON NUMBER OF PENETRATIONS.

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

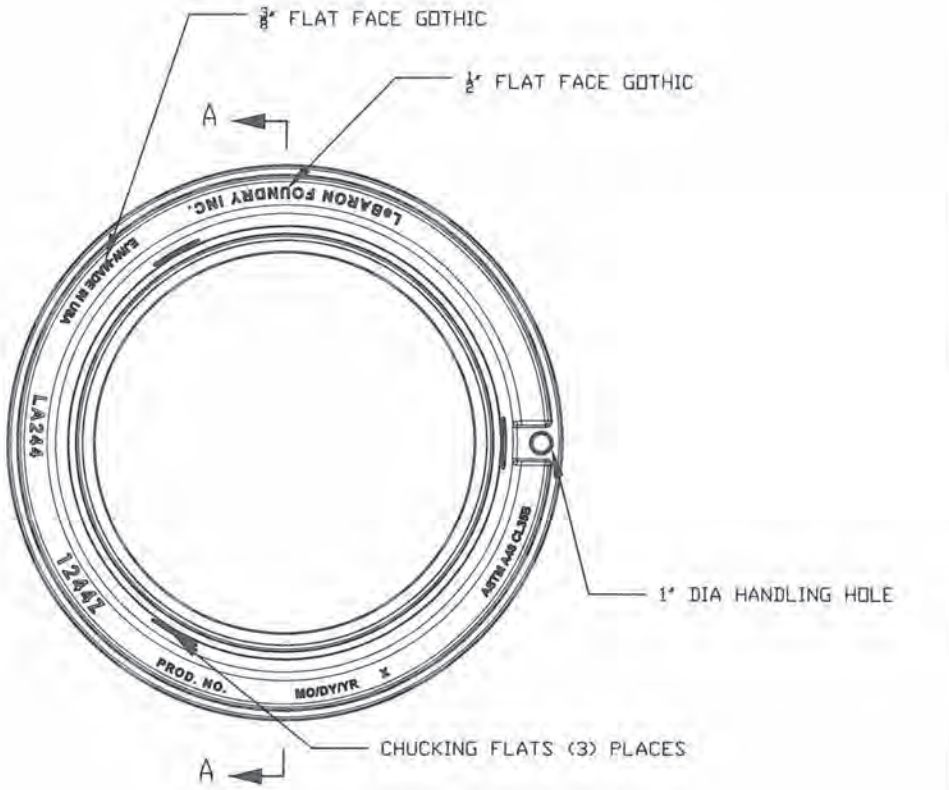
SPRINGFIELD WATER AND SEWER COMMISSION

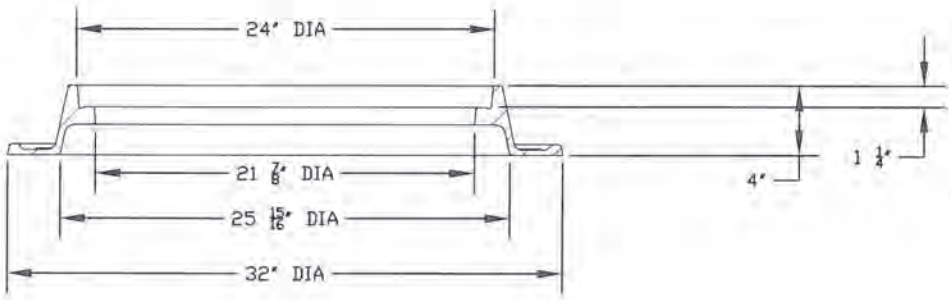
SEWER DETAIL S-02.4

INTERIOR DROP MANHOLE

SCALE: NTS

REV. DATE
4/1/08 MAB
6/18/08 MAB

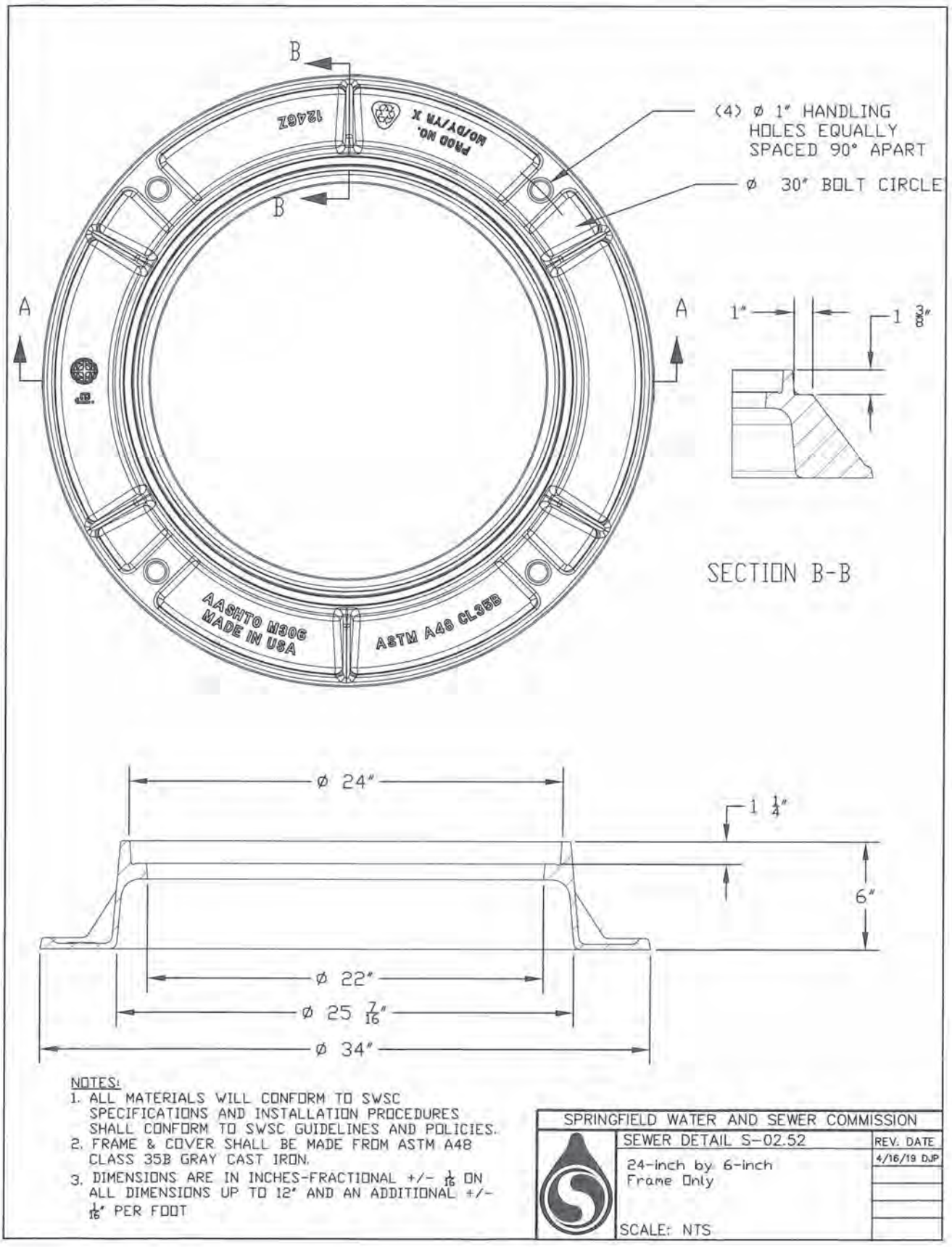




SECTION A-A
SCALE 1:10

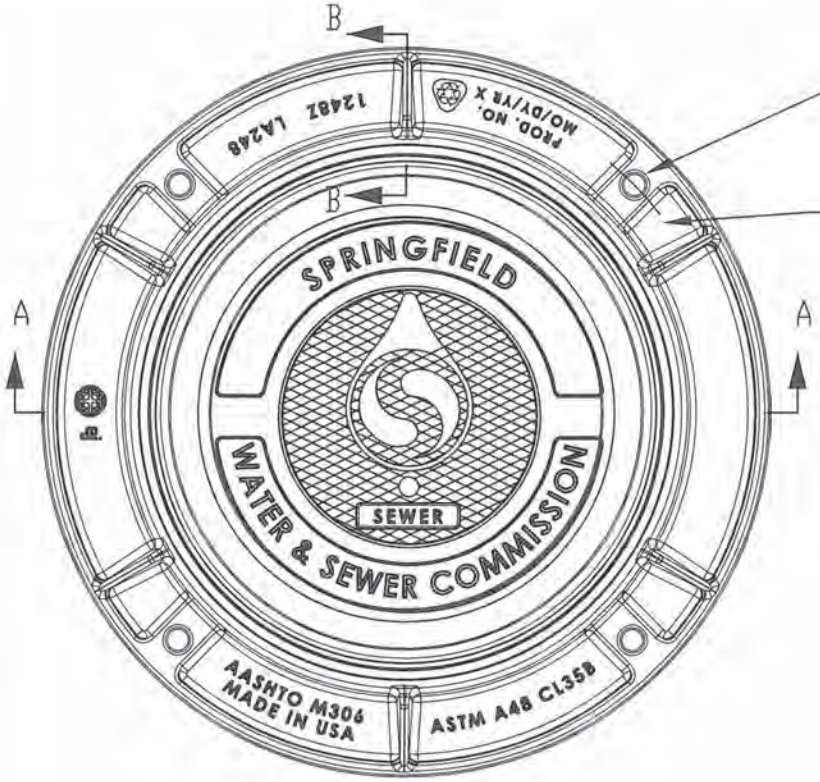
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.51	REV. DATE 4/16/19 DJP
	24-inch by 4-inch Frame Only	
	SCALE: NTS	



NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

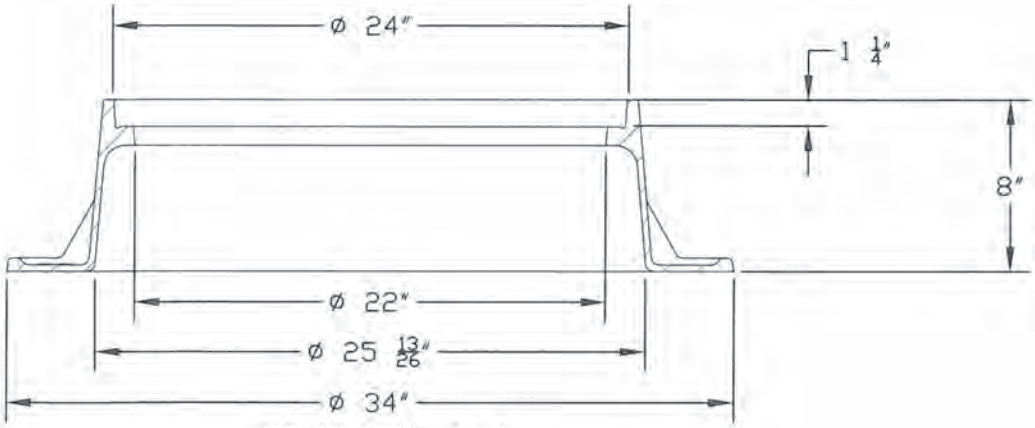
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.52	REV. DATE
	24-inch by 6-inch Frame Only	4/16/19 DJP
	SCALE: NTS	



(4) ø 1" HANDLING EQUALLY SPACED 90° APART

ø 30" BOLT CIRCLE

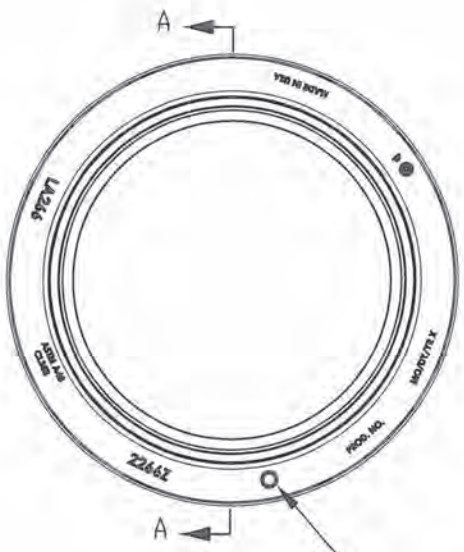
SECTION B-B

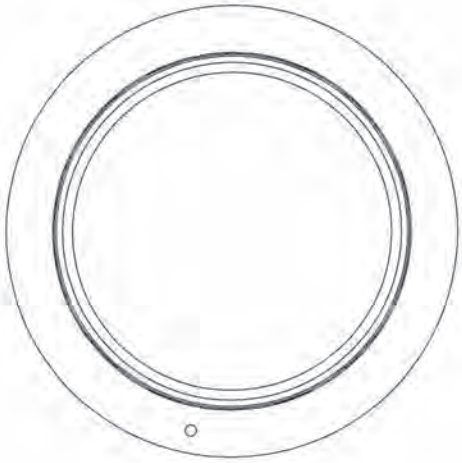


SECTION A-A

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

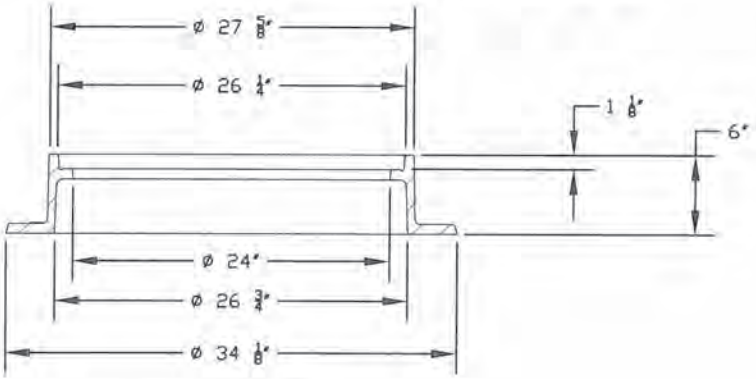
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.53	REV. DATE
	24-inch by 8-inch Frame Only	4/16/19 DJP
	SCALE: NTS	





BOTTOM VIEW

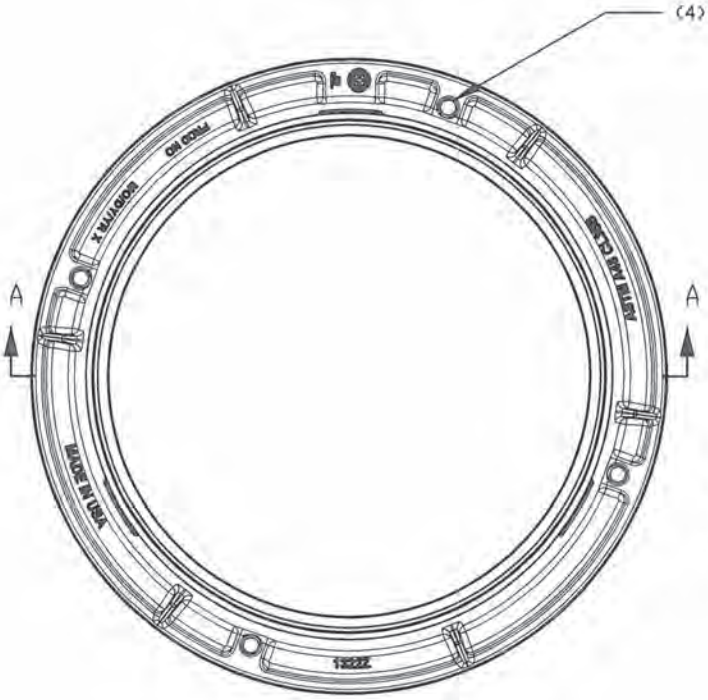
ø 7/8" HANDLING HOLE

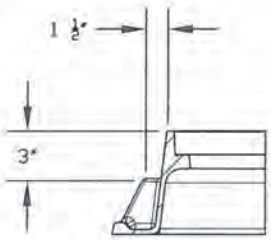


SECTION A-A

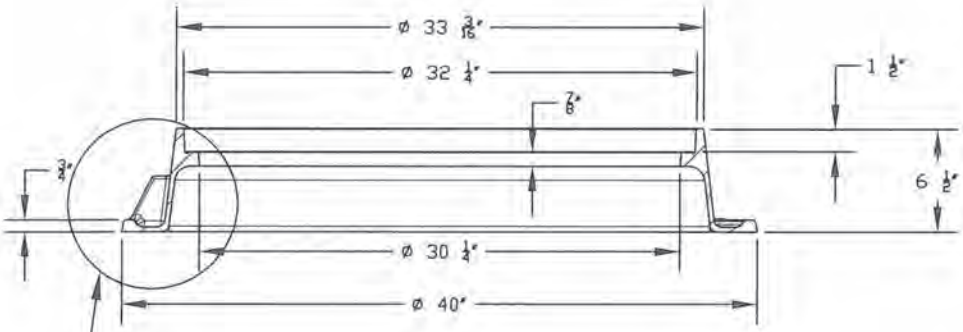
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.54	REV. DATE
	26-inch by 6-inch Frame Only	4/16/19 DJP
	SCALE: NTS	





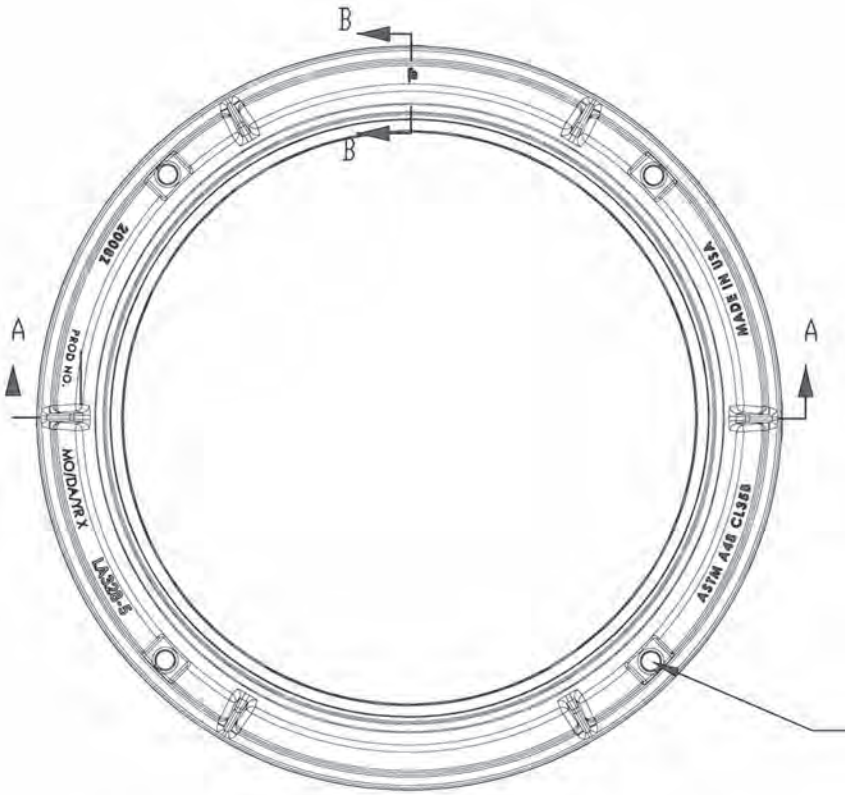
GUSSET DETAIL

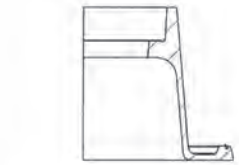


SECTION A-A

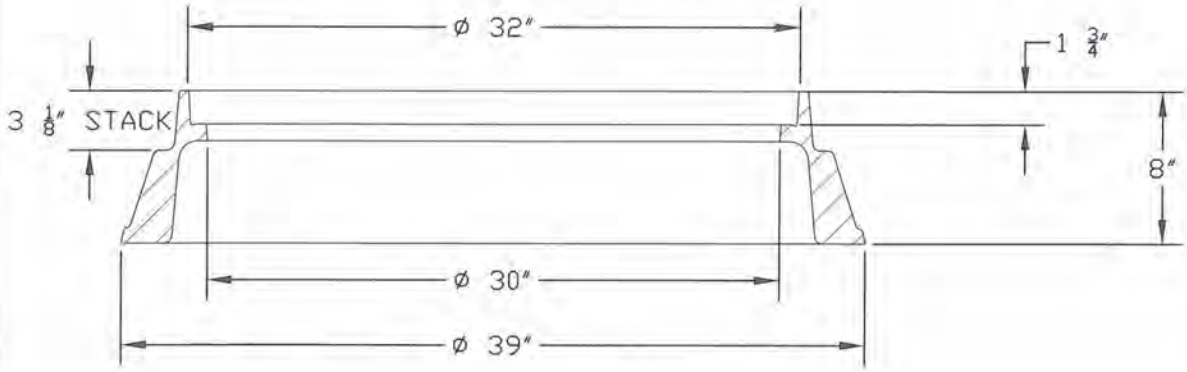
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.55	REV. DATE 4/16/19 DJP
	32-inch by 6-inch Frame Only	
	SCALE: NTS	





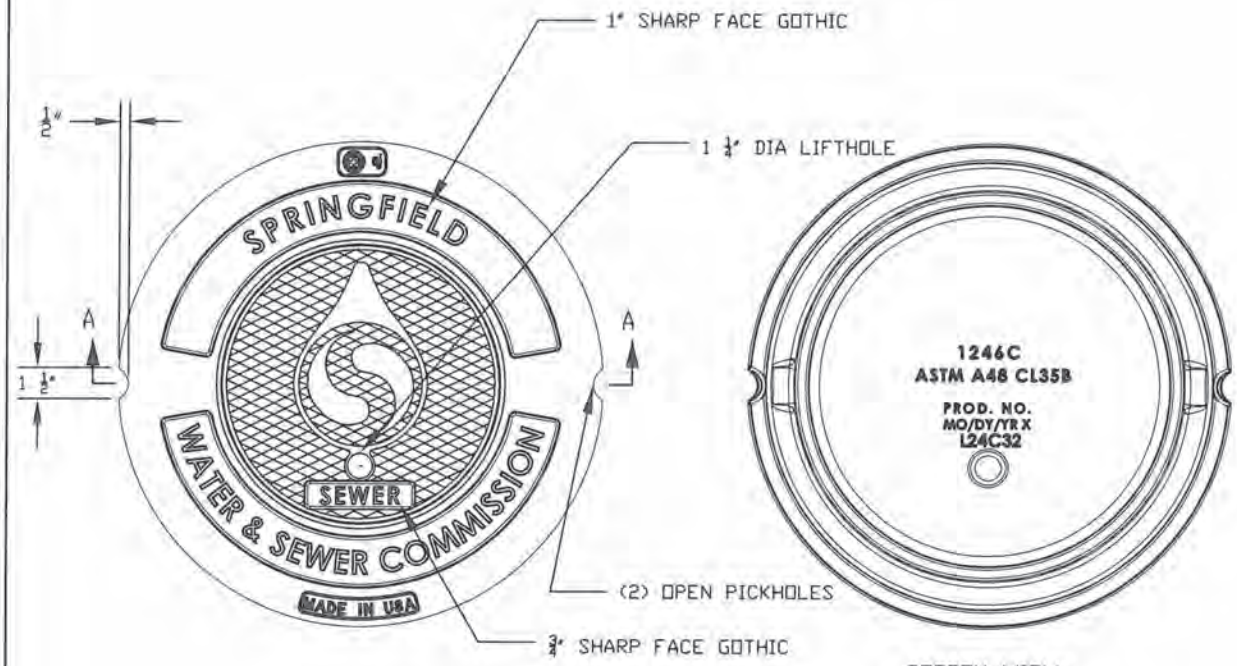
SECTION B-B

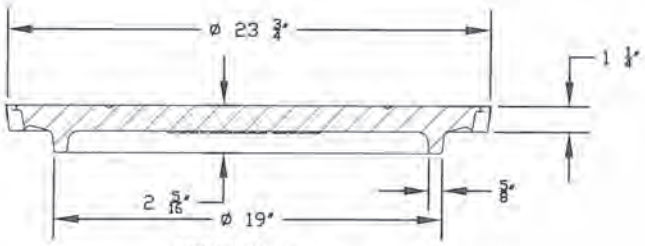


SECTION A-A

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.56	REV. DATE
	32-Inch by 8-Inch Frame Only	4/16/19 DJP
	SCALE: NTS	

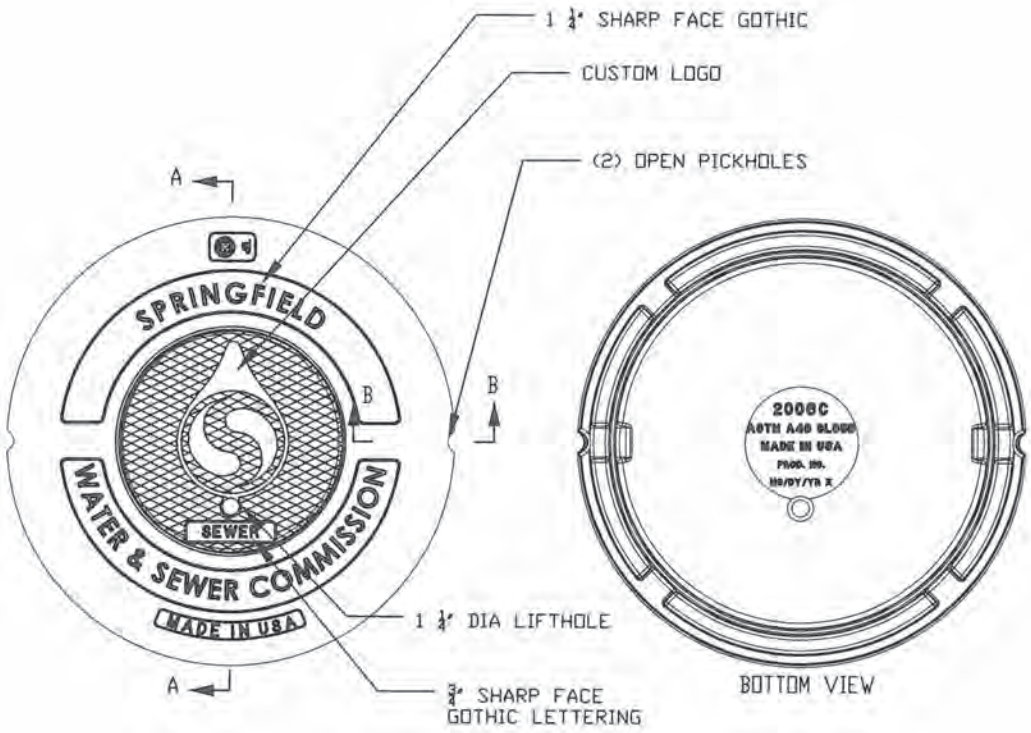


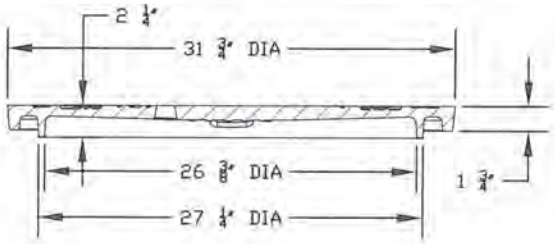


SECTION A-A

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.61	REV. DATE 4/16/19 DJP
	24-inch Standard Sewer Cover	
	SCALE: NTS	



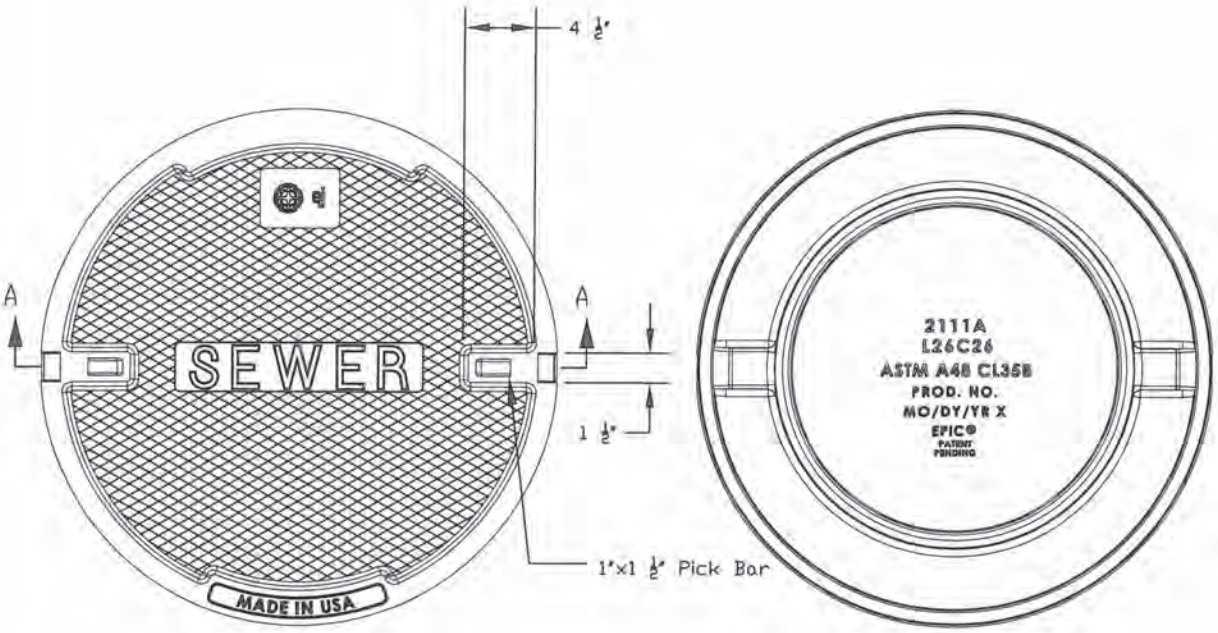


SECTION A-A

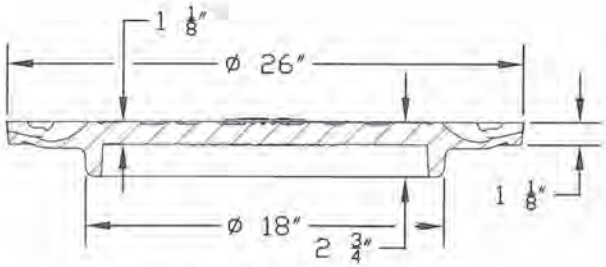
SECTION B-B
SCALE 1 : 8

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.62	REV. DATE
		4/16/19 DJP
	32-inch Standard Sewer Cover	
	SCALE: NTS	



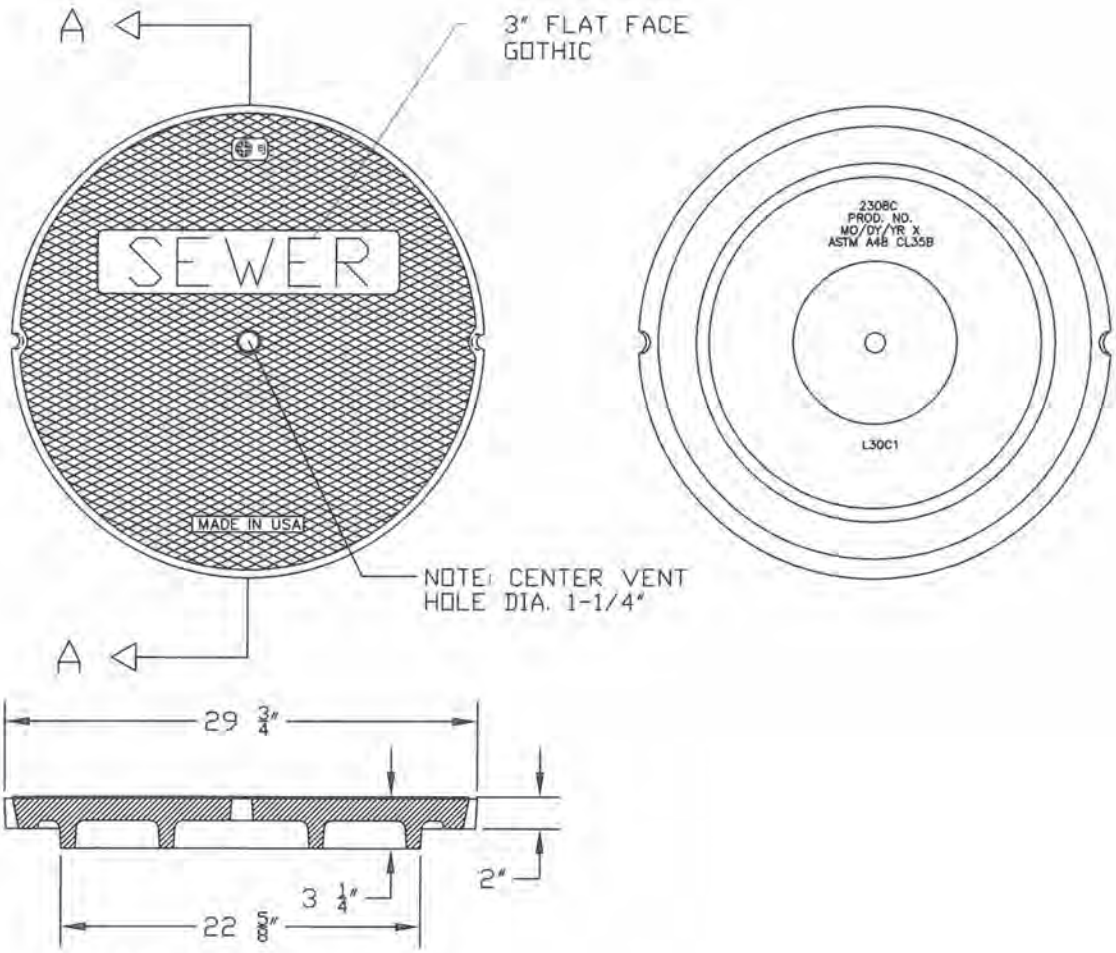
BOTTOM VIEW



SECTION A-A

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

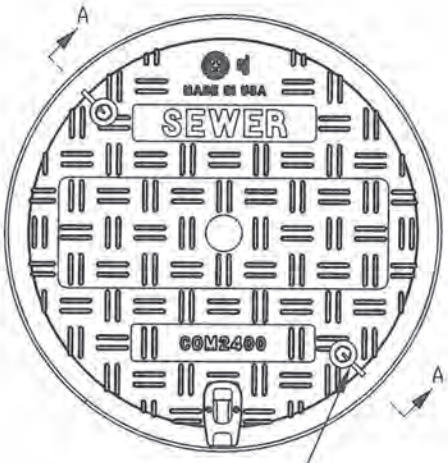
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.63	REV. DATE
	26-inch Replacement Sewer Cover	4/16/19 DJP
	SCALE: NTS	

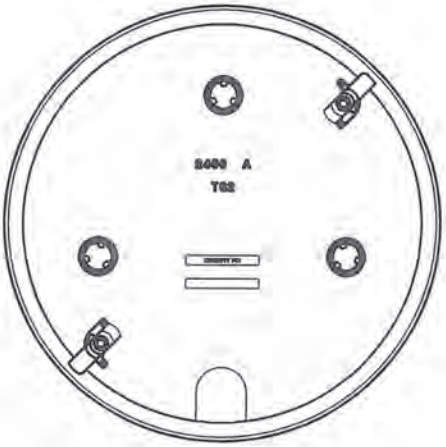


SECTION A-A

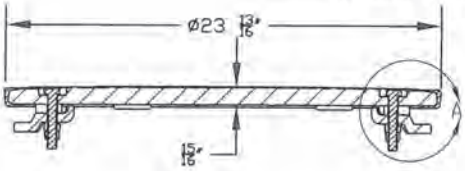
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

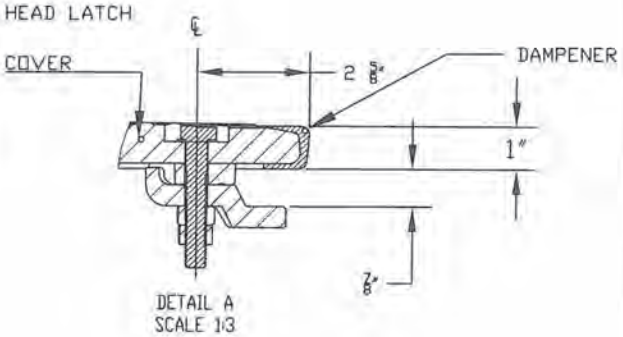
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.64	REV. DATE
	30-inch Replacement Sewer Cover	4/16/19 DJP
	SCALE: NTS	





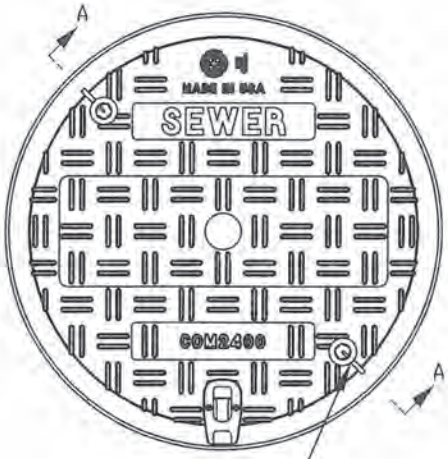
¼ TURN PENTA HEAD LATCH

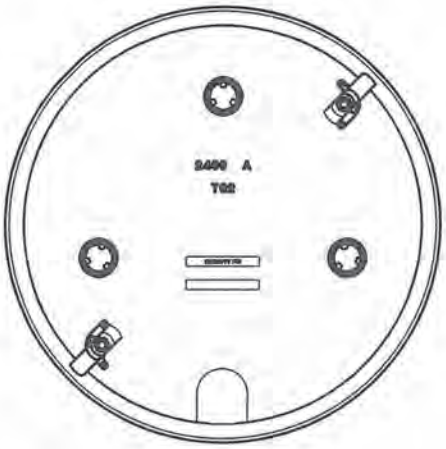




NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. COVER SHALL BE MADE FROM FIBER REINFORCED POLYMER (FRP) ASTM C1028
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

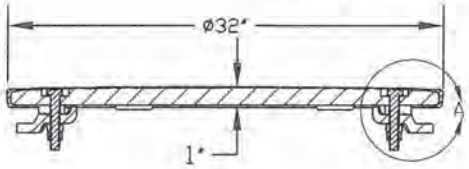
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.65	REV. DATE
	24" Composite Locking Cover	4/19/19 DJP
	SCALE: NTS	



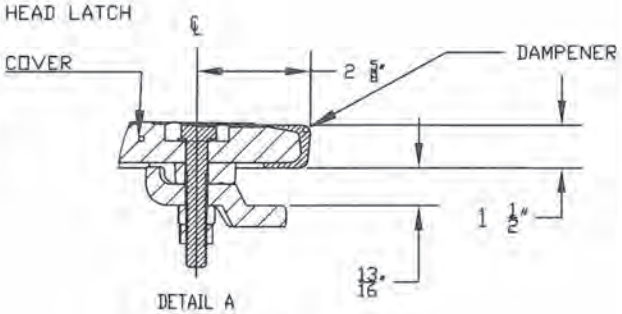


BOTTOM VIEW

¼ TURN PENTA HEAD LATCH



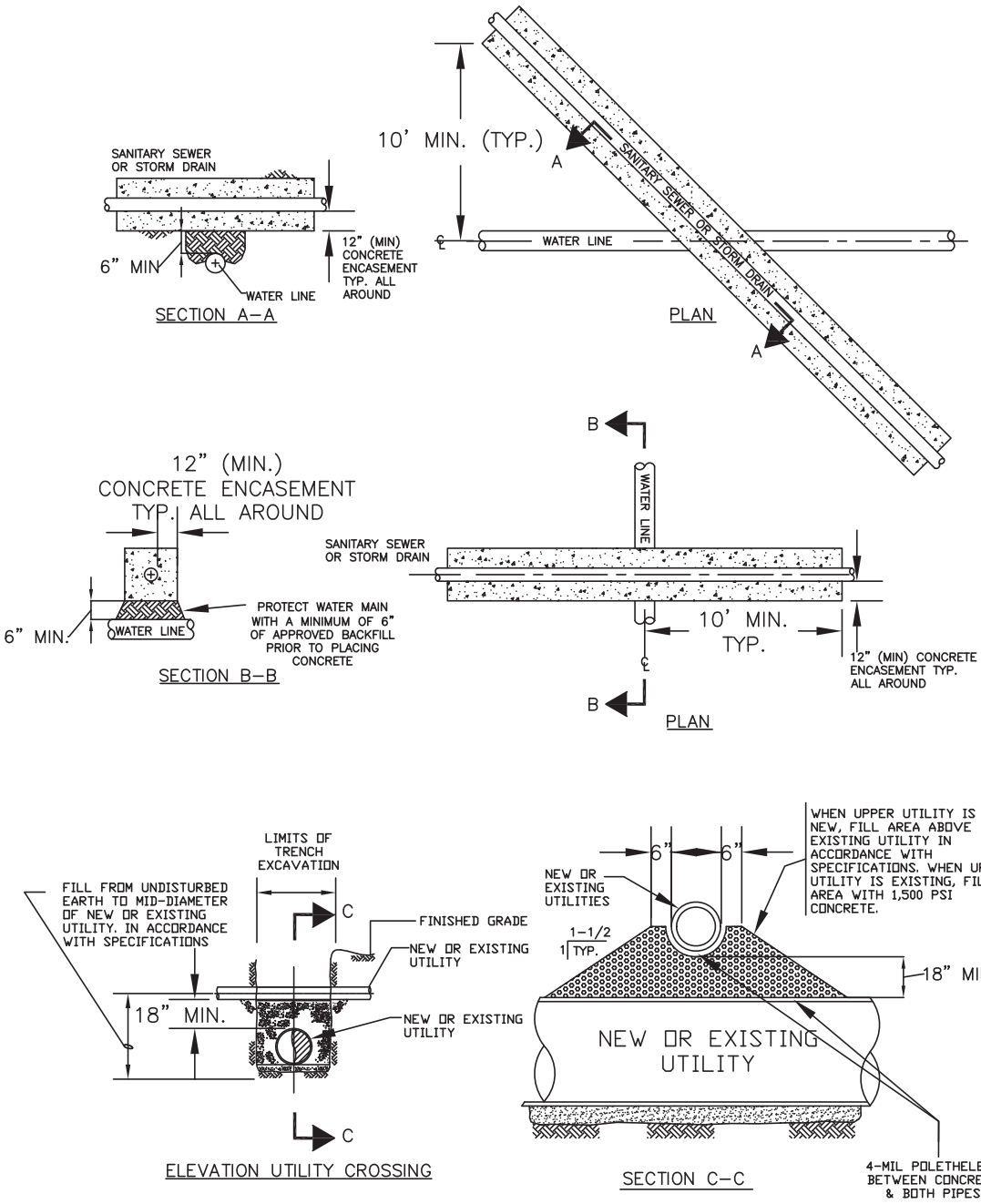
SECTION A-A



DETAIL A
SCALE 1:3

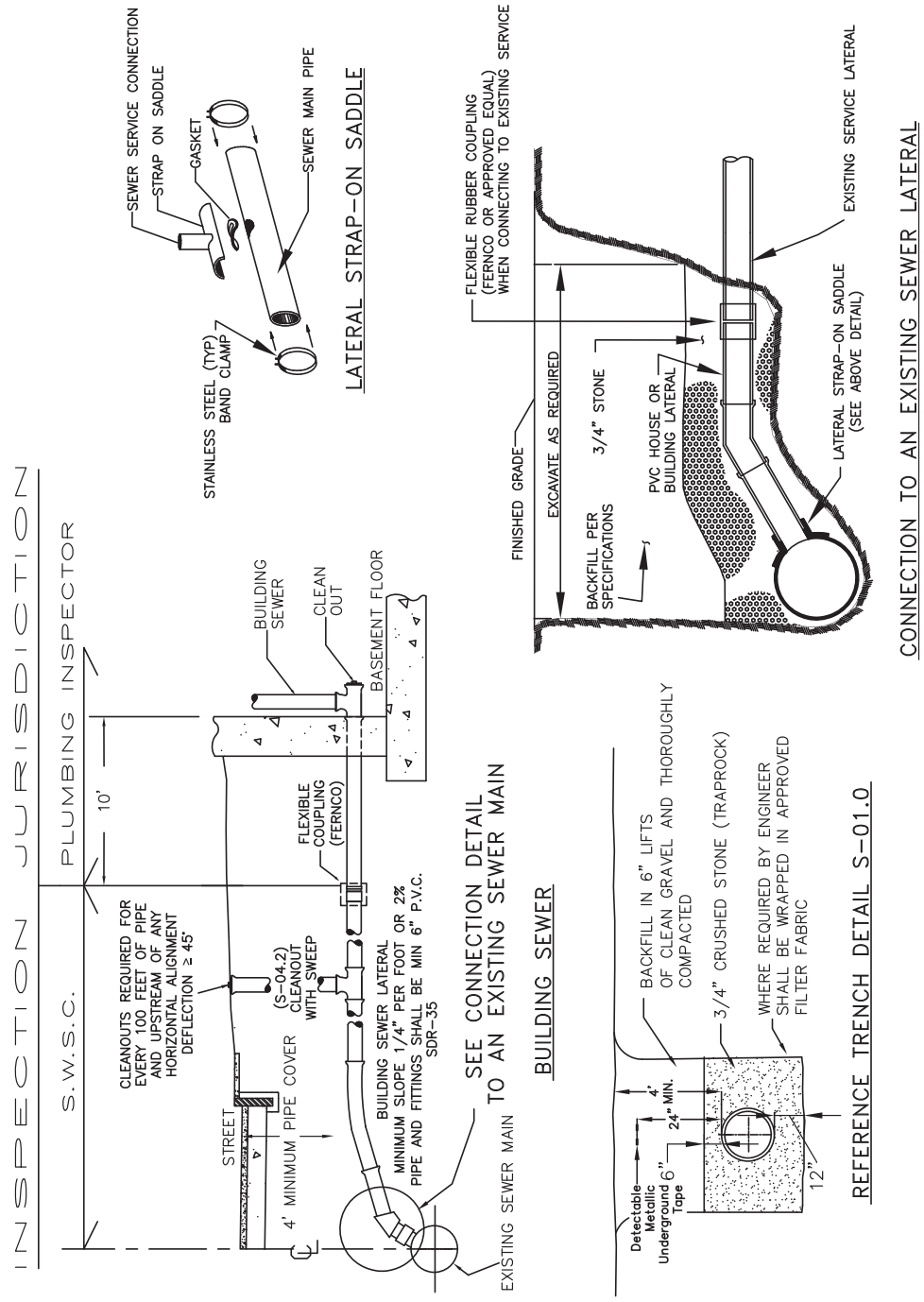
NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. COVER SHALL BE MADE FROM FIBER REINFORCED POLYMER (FRP) ASTM C1028
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.66	REV. DATE
	32-inch Composite Locking Cover	4/19/19 DJP
	SCALE: NTS	



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. IF DEPTH OF COVER ABOVE CONCRETE ENCASEMENT IS GREATER THAN 5'–0" REINFORCEMENT STEEL SHALL BE USED.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S–03.0	REV. DATE
		4/1/08 MAB
	UTILITY CROSSING DETAIL	6/18/08 MAB
		4/6/21 MJL
	SCALE: NTS	



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

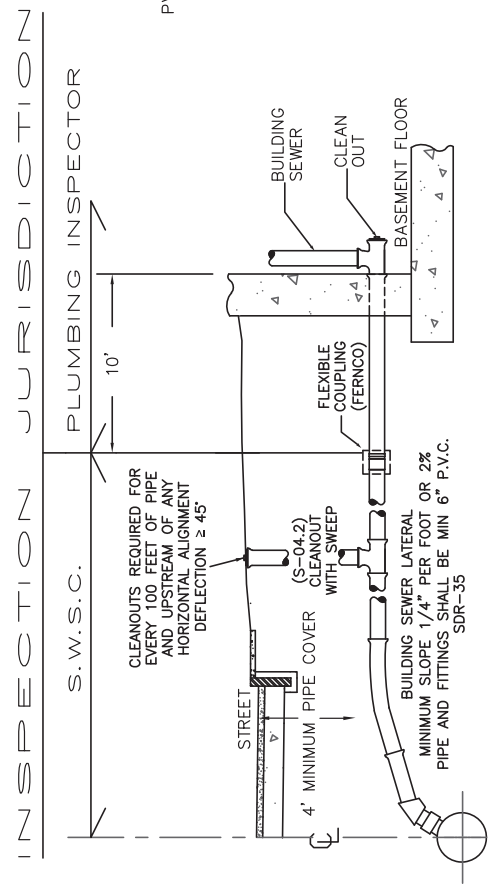
SPRINGFIELD WATER AND SEWER COMMISSION

SEWER DETAIL S-04.0

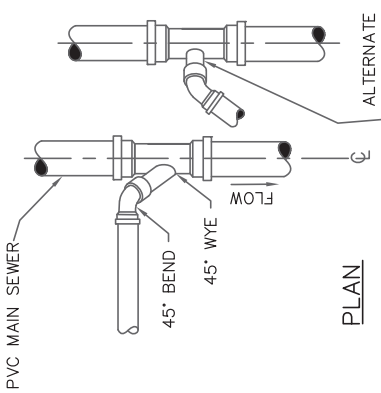
EXISTING SEWER MAIN TO BUILDING CONNECTION

SCALE: NTS

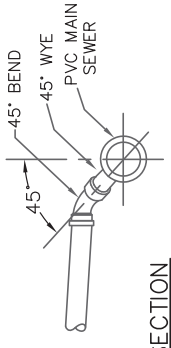
REV. DATE
4/1/08 MAB
10/6/20 DS
3/17/21 MJL



BUILDING SEWER

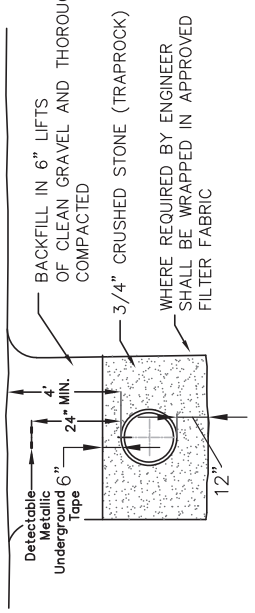


PLAN



SECTION

LATERAL CONNECTION TO A NEW SEWER MAIN



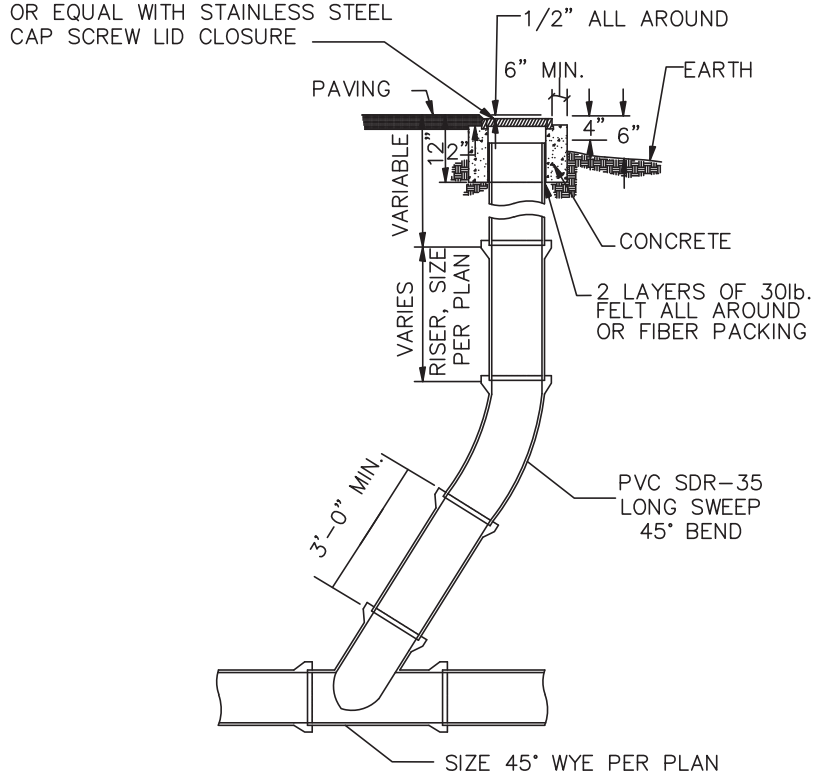
REFERENCE TRENCH DETAIL S-01.0

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.1	REV. DATE
		4/1/08 MAB
	NEW SEWER MAIN TO BUILDING CONNECTION	10/6/20 DS
		3/17/21 MJL
	SCALE: NTS	

DETAIL FOR CLEANOUTS IN PAVED SURFACES

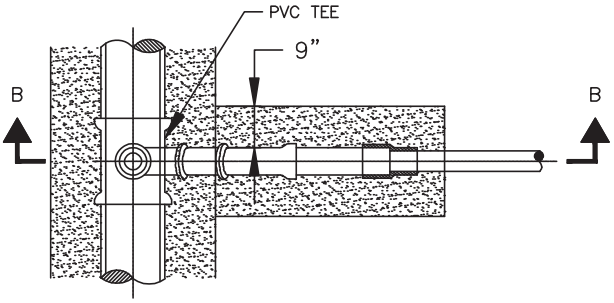
DETAIL FOR CLEAN OUTS IN EASEMENTS



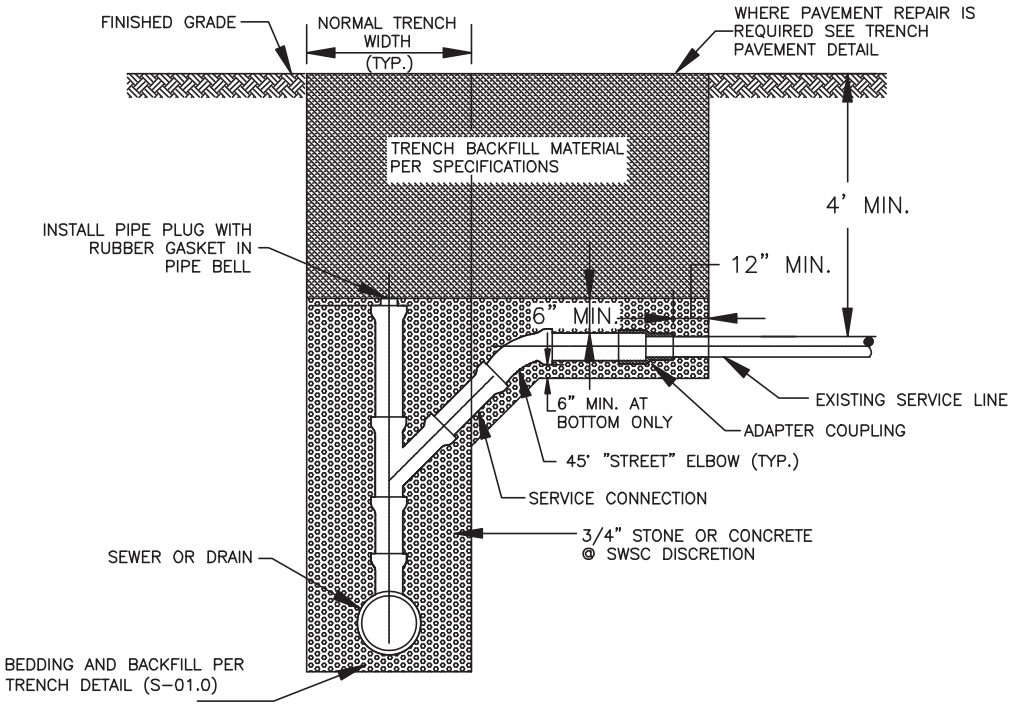
* **REQUIRED** – EVERY 100 FEET OF PIPE AND UPSTREAM OF ANY HORIZONTAL ALIGNMENT DEFLECTION GREATER THAN OR EQUAL TO 45 DEGREES

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.
5. CLEAN OUT PIPE DIAMETER SHALL BE THE SAME AS THE SEWER LINE AT THE WYE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.2	REV. DATE
	CLEAN OUT WITH SWEEP	4/1/08 MAB
		10/06/20 DS
	SCALE: NTS	



PLAN

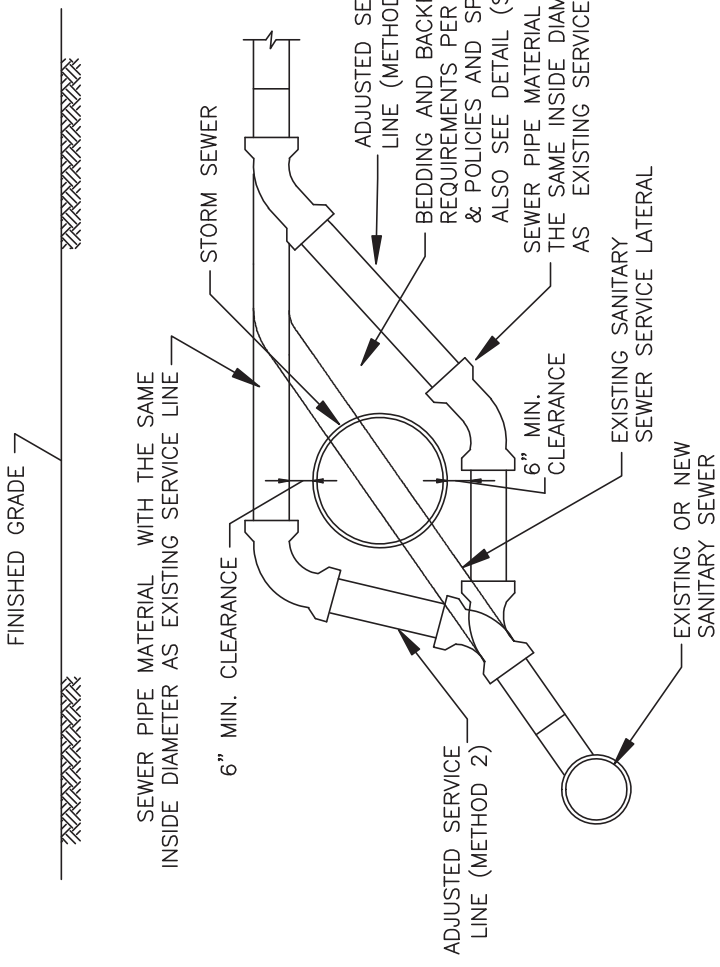


SECTION B-B

SEWER OR DRAIN SERVICE CONNECTION WITH CHIMNEY GREATER THAN 12' DEEP

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.
5. CLEAN OUT PIPE DIAMETER SHALL BE THE SAME AS THE SEWER LINE AT THE WYE.

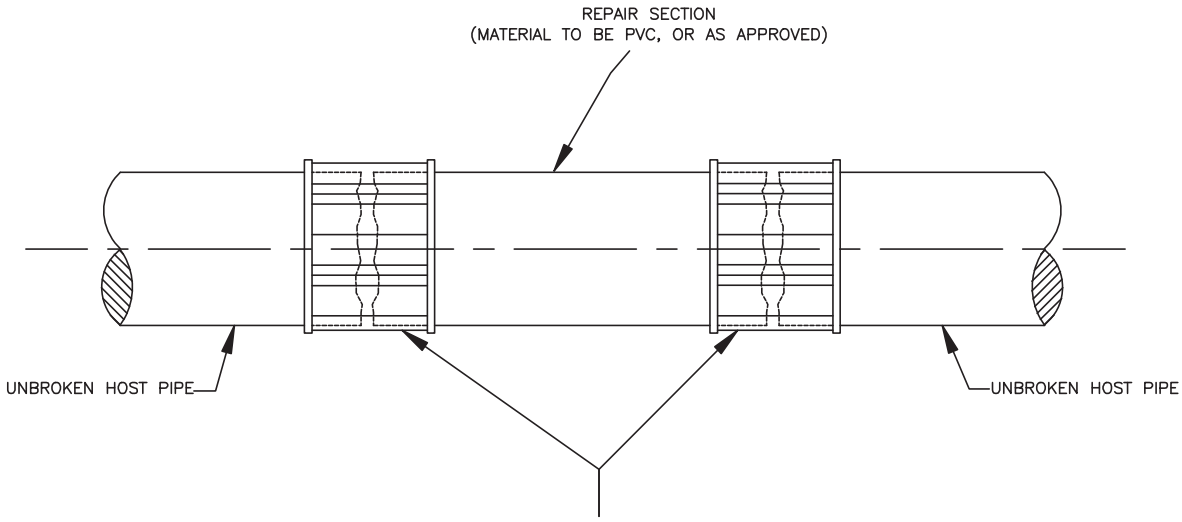
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.3	REV. DATE
		4/1/08 MAB
	SEWER SERVICE CONNECTION WITH CHIMNEY >12' DEEP	
	SCALE: NTS	



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.4	REV. DATE
		4/1/08 MAB
	BUILDING CONNECTION TO SEWER MAIN WITH CONFLICTS	
	SCALE: NTS	

TYPICAL REPAIR



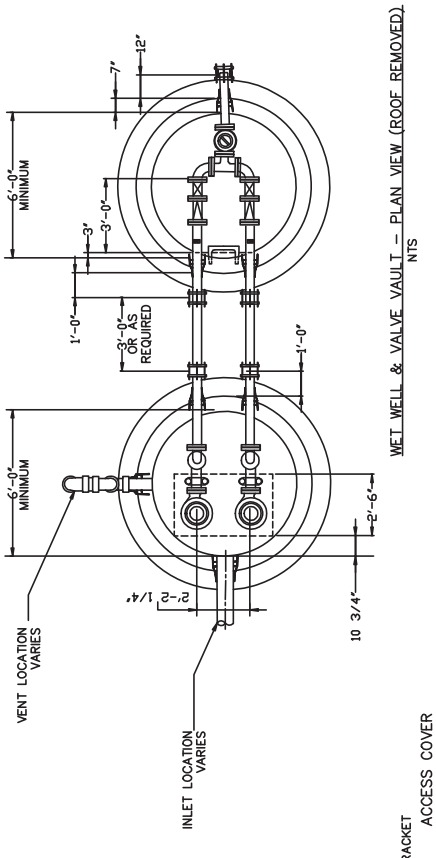
PVC SLIP COUPLINGS, RUBBER COUPLINGS (FERNCO OR APPROVED EQUAL)

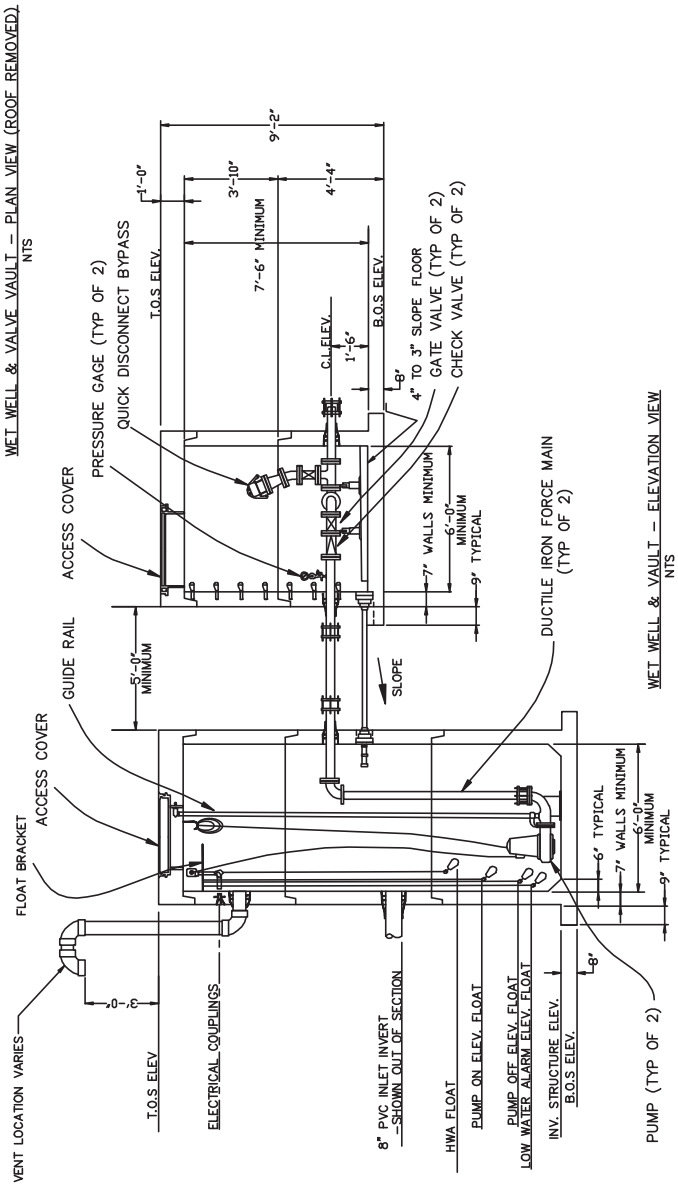
BRICK OR EGG SHAPED SEWER REPAIR MAY HAVE ADDITIONAL REQUIREMENTS BY SWSC

NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. SEWER REPAIR SECTION MATERIAL SHALL BE THE SAME MATERIAL AS THE HOST PIPE, OR AS APPROVED BY SWSC.
5. REPAIR SECTION SHALL BE SIZED TO BUTT AGAINST THE HOST PIPES.

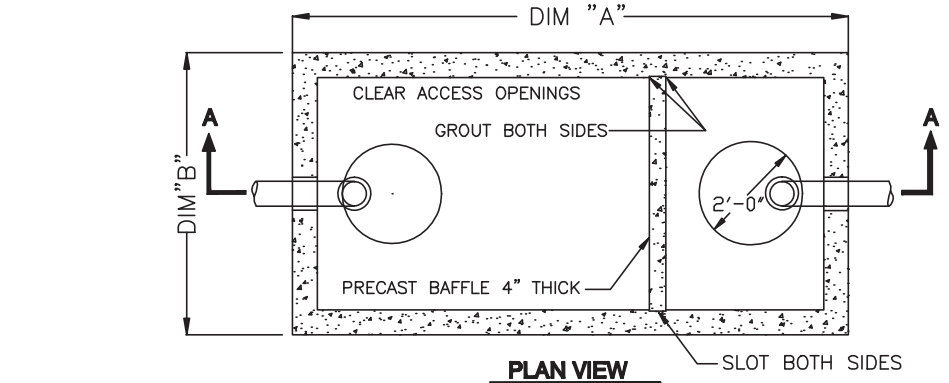
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-05.0	REV. DATE
		4/1/08 MAB
	BUILDING AND MAINLINE SEWER REPAIR	
	SCALE: NTS	



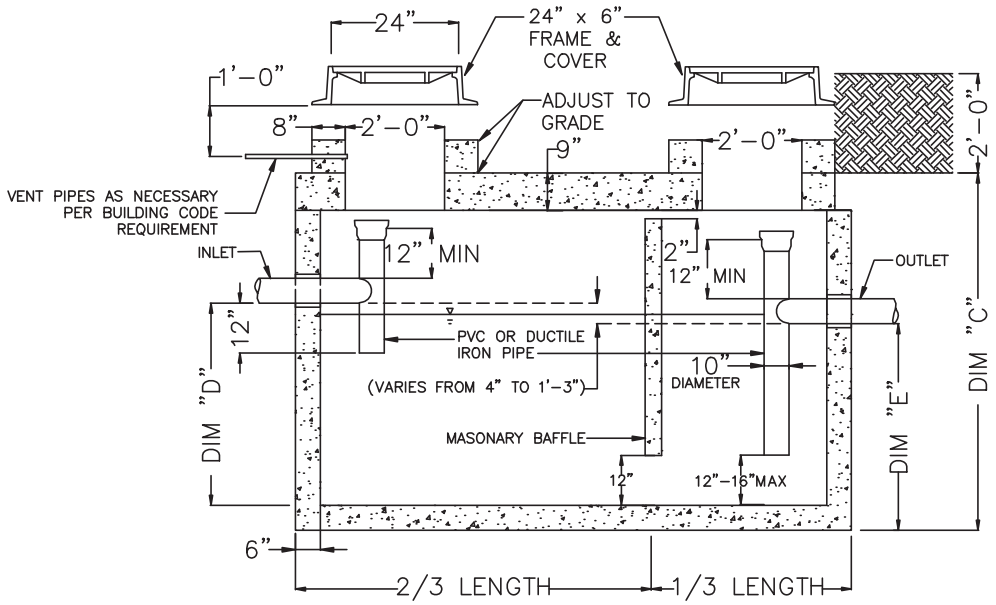


NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-06.0	REV. DATE
		4/1/08 MAB
	WETWELL &VALVE VAULT PRECAST	
	SCALE: NTS	



PLAN VIEW



SECTION A-A

SIZING CHART					
GALLON CAPATCITY	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"
750	7'-0"	4'-8"	7'-0"	4'-3"	3'-11"
1000	9'-0"	5'-0"	7'-2"	4'-2"	3'-10"
1250	9'-0"	5'-0"	7'-2"	5'-2"	4'-10"
1500	11'-2"	5'-8"	7'-2"	4'-4"	4'-0"
1750	11'-2"	5'-8"	7'-2"	4'-11"	4'-7"
2000	12'-8"	6'-8"	8'-0"	4'-7"	3'-10"
2500	12'-8"	6'-8"	8'-0"	5'-6"	4'-9"
2750	12'-8"	6'-8"	8'-0"	6'-0"	5'-3"
3000	15'-7"	9'-7"	8'-6.5"	5'-0"	3'-9"
4000	15'-7"	9'-7"	8'-6.5"	6'-3"	5'-0"
5000	19'-11"	9-11"	8'-11"	6'-2"	4'-9"
6000	19'-11"	9-11"	10'-5"	7'-2"	5'-9"

GENERAL CONSTRUCTION NOTES:
1. CONCRETE : 28 DAY F'c= 4500 psi
2. REBAR : ASTM A615 GRADE 60.
3. MESH : ASTM A-185 GRADE 65
4. DESIGN : AC1318-83 BUILDING CODE
   ASTM C-857 MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES
5. LOADS :H-20 LOADING.
6. FILL w/CLEAN WATER PRIOR TO START UP OF SYSTEM.
7. CONTRACTOR TO SUPPLY AND INSTALL ALL PIPING AND SANITARY TEES ,4 CLEAN OUTS, FOR CLEANING TOWARD TRAP AND FOR CLEANING AWAY FROM TRAP ON BOTH THE INLET AND OUTLET / ALT. DUAL SWEEP CLEANOUTS.
8. GRAY WATER ONLY, BLACK WATER SHALL BE CARRIED BY SEPARATE SEWER.
9. TRAP SIZE WILL BE BASED ON 15 GPD PER SEAT OR OTHER APPROVED SIZING CRITERIA.
10. LARGER SIZES MAY BE REQUIRED AS PER REVIEW OF FACILITY.
11. MUST BE PRESSURE TESTED PER ASTM C163-06.
12. BALLAST/BOUYANCY CALCULATIONS REQUIRED IF AVERAGE HIGH GROUND WATER TABLE IS ENCOUNTERED.

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER SERVICE PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. SEWER REPAIR SECTION MATERIAL SHALL BE THE SAME MATERIAL AS THE HOST PIPE, OR AS APPROVED BY SWSC.
5. REPAIR SECTION SHALL BE SIZED TO BUTT AGAINST THE HOST PIPES.

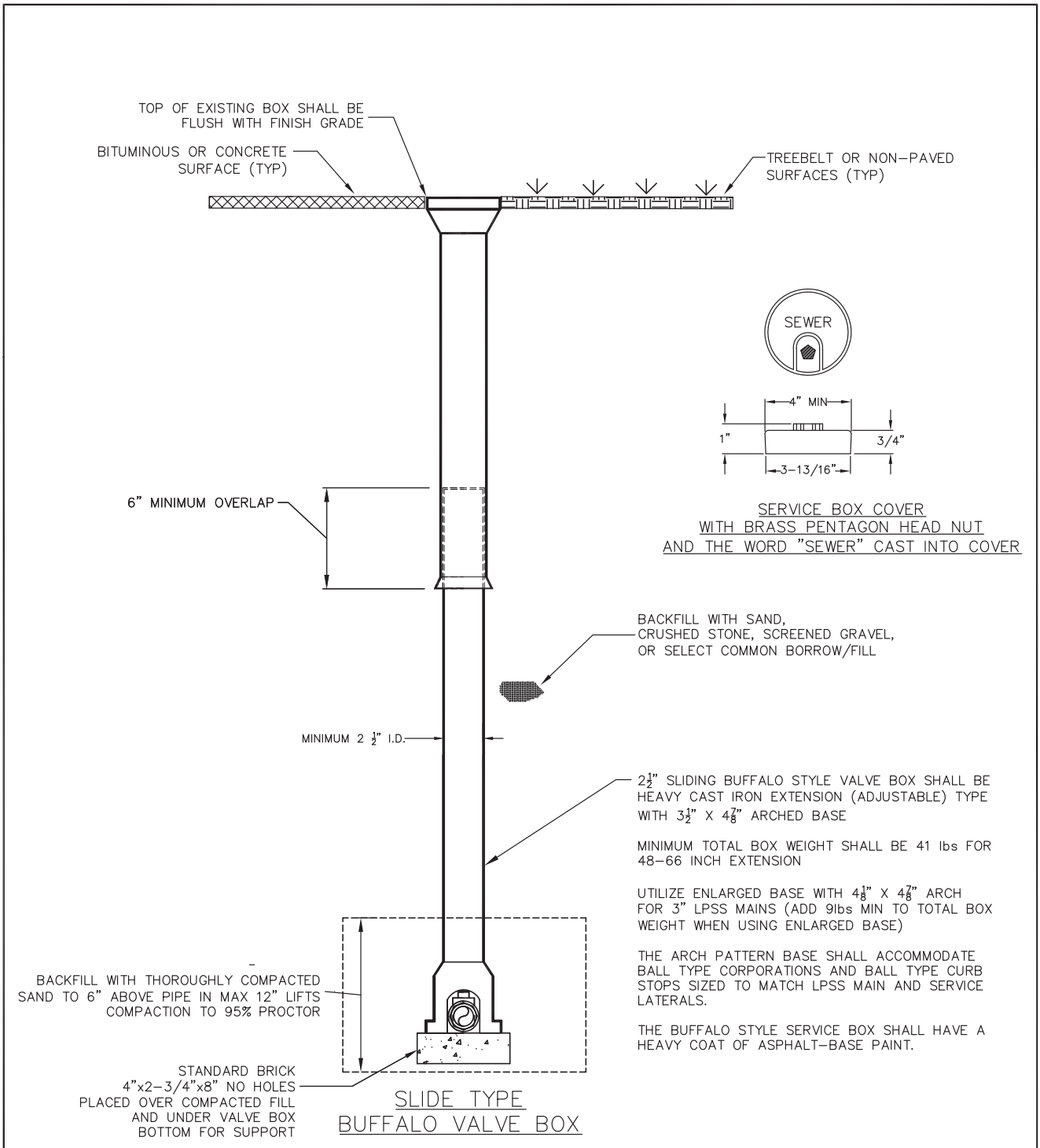
SPRINGFIELD WATER AND SEWER COMMISSION

SEWER DETAIL S-08.0

STANDARD EXTERNAL GREASE INTERCEPTOR

SCALE: NTS

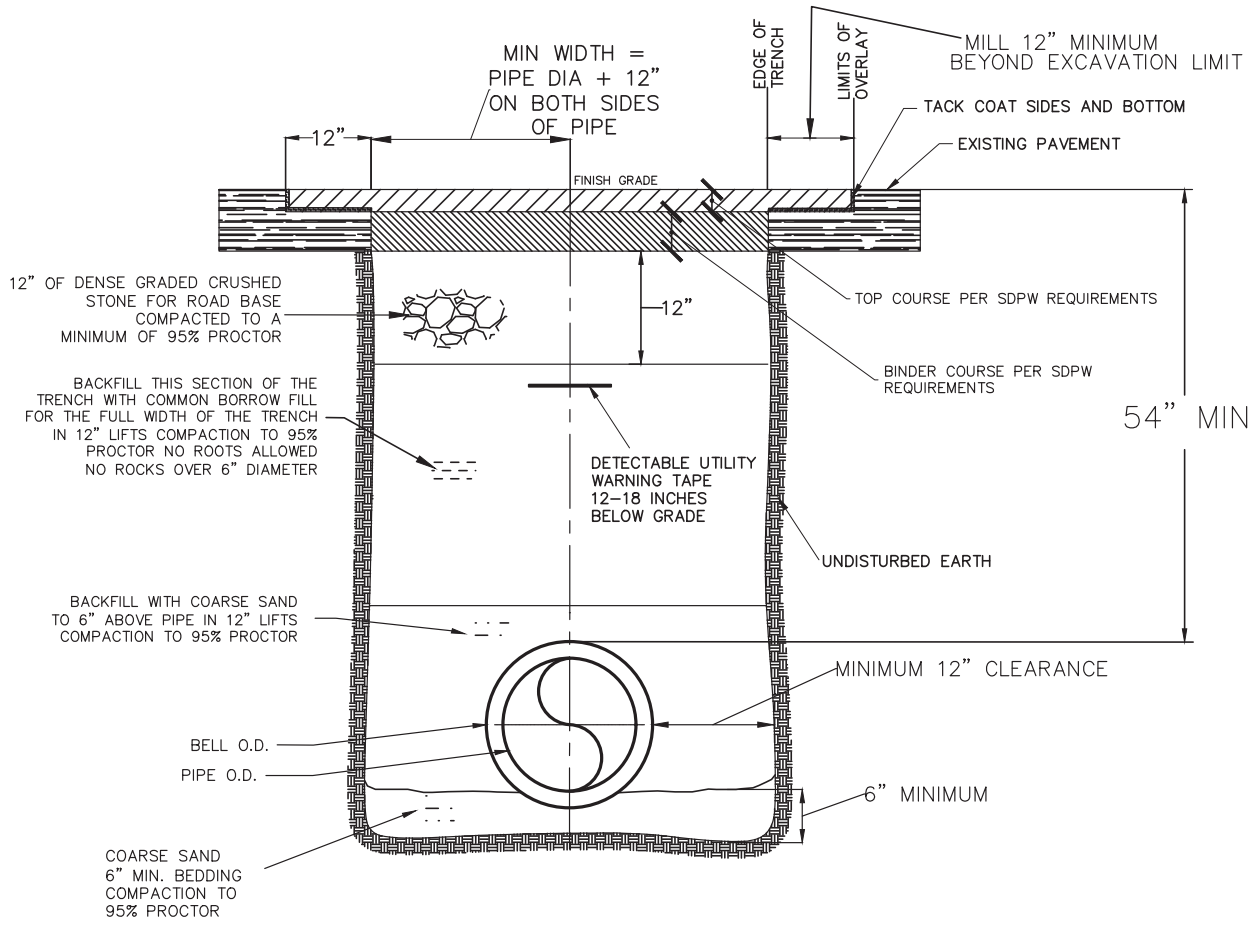
REV. DATE
4/1/09 MAB



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) FOR A TOTAL OF 54 INCHES. PIPE SHALLOWER THAN 54 INCHES SHALL BE INSULATED.
3. SEE DETAIL S-09.3 FOR TRENCH DETAILS
4. IF BACKFILLING WITH "FLOWABLE" FILL WRAP THE SERVICE BOX WITH 15 POUND FELT ROOFING PAPER OR 4 MIL THICK POLYETHYLENE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-09.1	REV. DATE
	LOW PRESSURE SANITARY SERVICE / MAIN 2 1/2" VALVE BOX IN NON-PAVED AREAS	1/18/19 DS
		10/28/20 DS
	SCALE: NTS	

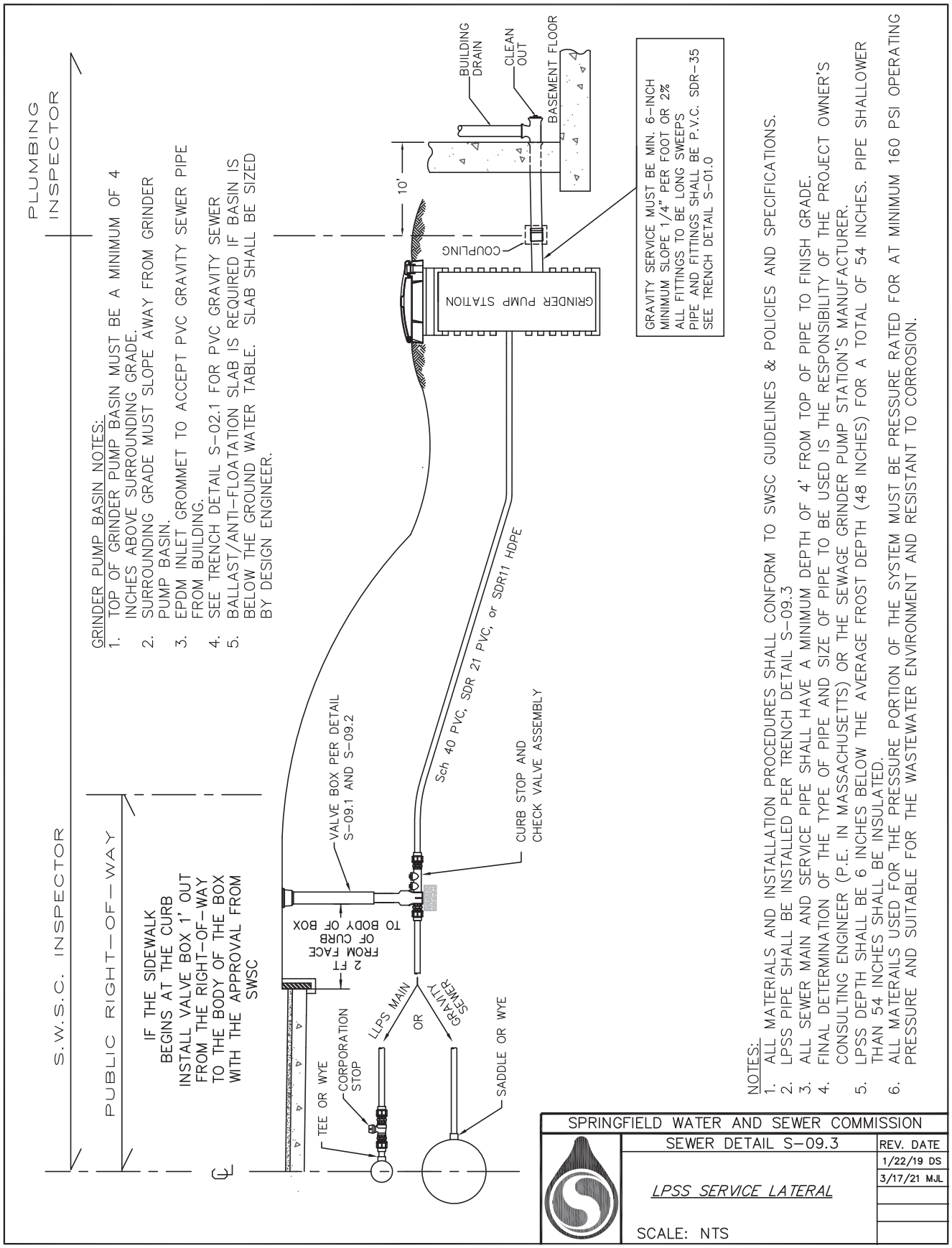


EXISTING PAVEMENT
EXCAVATED AND REPLACED WITH BINDER COURSE
DENSE GRADED CRUSHED STONE
COMMON BORROW
BEDDING SAND
TACK COAT
MILLED AND REPLACED WITH TOP COURSE
UNDISTURBED EARTH

NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) FOR A TOTAL OF 54 INCHES. PIPE SHALLOWER THAN 54 INCHES SHALL BE INSULATED.
3. DETECTABLE WARNING TAPE SHALL BE INSTALLED 12–18 INCHES BELOW GRADE TO ALLOW USE OF A METAL DETECTOR FOR FUTURE FIELD LOCATION AND UTILITY MARKOUT.
4. REQUIREMENTS FOR ROAD BASE, PAVEMENT, AND JOINT SEAL ARE TO BE IN ACCORDANCE WITH THE LATEST VERSION OF THE CITY OF SPRINGFIELD DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION'S 'MANUAL FOR OCCUPANCY OF PUBLIC WAYS AND PRIVATE WAYS WITHIN THE CITY OF SPRINGFIELD'.
5. TRENCH RESTORATION OUTSIDE OF ROADWAY LPSS ALIGNMENTS SHALL MEET REQUIREMENTS FOR GRAVEL, VEGETATION, LOAM AND/OR SEED IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON–PAVED AREAS.
6. FOR TYPICAL LOCATION OF SEWER MAINS SEE DETAIL (W–01.0).
7. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL S–09.2	REV. DATE
LOW PRESSURE SANITARY SEWER PIPE TRENCH DETAIL	1–18–19 DS
SCALE: NTS	


PLUMBING INSPECTOR
S.W.S.C. INSPECTOR
PUBLIC RIGHT-OF-WAY
IF THE SIDEWALK BEGINS AT THE CURB INSTALL VALVE BOX 1' OUT FROM THE RIGHT-OF-WAY TO THE BODY OF THE BOX WITH THE APPROVAL FROM SWSC
GRINDER PUMP BASIN NOTES:
1. TOP OF GRINDER PUMP BASIN MUST BE A MINIMUM OF 4 INCHES ABOVE SURROUNDING GRADE.
2. SURROUNDING GRADE MUST SLOPE AWAY FROM GRINDER PUMP BASIN.
3. EPDM INLET GROMMET TO ACCEPT PVC GRAVITY SEWER PIPE FROM BUILDING.
4. SEE TRENCH DETAIL S-02.1 FOR PVC GRAVITY SEWER
5. BALLAST/ANTI-FLOATATION SLAB IS REQUIRED IF BASIN IS BELOW THE GROUND WATER TABLE. SLAB SHALL BE SIZED BY DESIGN ENGINEER.
BUILDING DRAIN
CLEAN OUT
BASEMENT FLOOR
10'
COUPLING
GRINDER PUMP STATION
GRAVITY SERVICE MUST BE MIN. 6-INCH MINIMUM SLOPE 1/4" PER FOOT OR 2% ALL FITTINGS TO BE LONG SWEEPS PIPE AND FITTINGS SHALL BE P.V.C. SDR-35 SEE TRENCH DETAIL S-01.0
VALVE BOX PER DETAIL S-09.1 AND S-09.2
Sch 40 PVC, SDR 21 PVC, or SDR11 HDPE
CURB STOP AND CHECK VALVE ASSEMBLY
2 FT FROM FACE OF CURB TO BODY OF BOX
TEE OR WYE
CORPORATION STOP
LLPS MAIN
OR
GRAVITY SEWER
SADDLE OR WYE
NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. LPSS PIPE SHALL BE INSTALLED PER TRENCH DETAIL S-09.3
3. ALL SEWER MAIN AND SERVICE PIPE SHALL HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
4. FINAL DETERMINATION OF THE TYPE OF PIPE AND SIZE OF PIPE TO BE USED IS THE RESPONSIBILITY OF THE PROJECT OWNER'S CONSULTING ENGINEER (P.E. IN MASSACHUSETTS) OR THE SEWAGE GRINDER PUMP STATION'S MANUFACTURER.
5. LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) FOR A TOTAL OF 54 INCHES. PIPE SHALLOWER THAN 54 INCHES SHALL BE INSULATED.
6. ALL MATERAILS USED FOR THE PRESSURE PORTION OF THE SYSTEM MUST BE PRESSURE RATED FOR AT MINIMUM 160 PSI OPERATING PRESSURE AND SUITABLE FOR THE WASTEWATER ENVIRONMENT AND RESISTANT TO CORROSION.
SPRINGFIELD WATER AND SEWER COMMISSION
SEWER DETAIL S-09.3
REV. DATE
1/22/19 DS
3/17/21 MJL
LPSS SERVICE LATERAL
SCALE: NTS

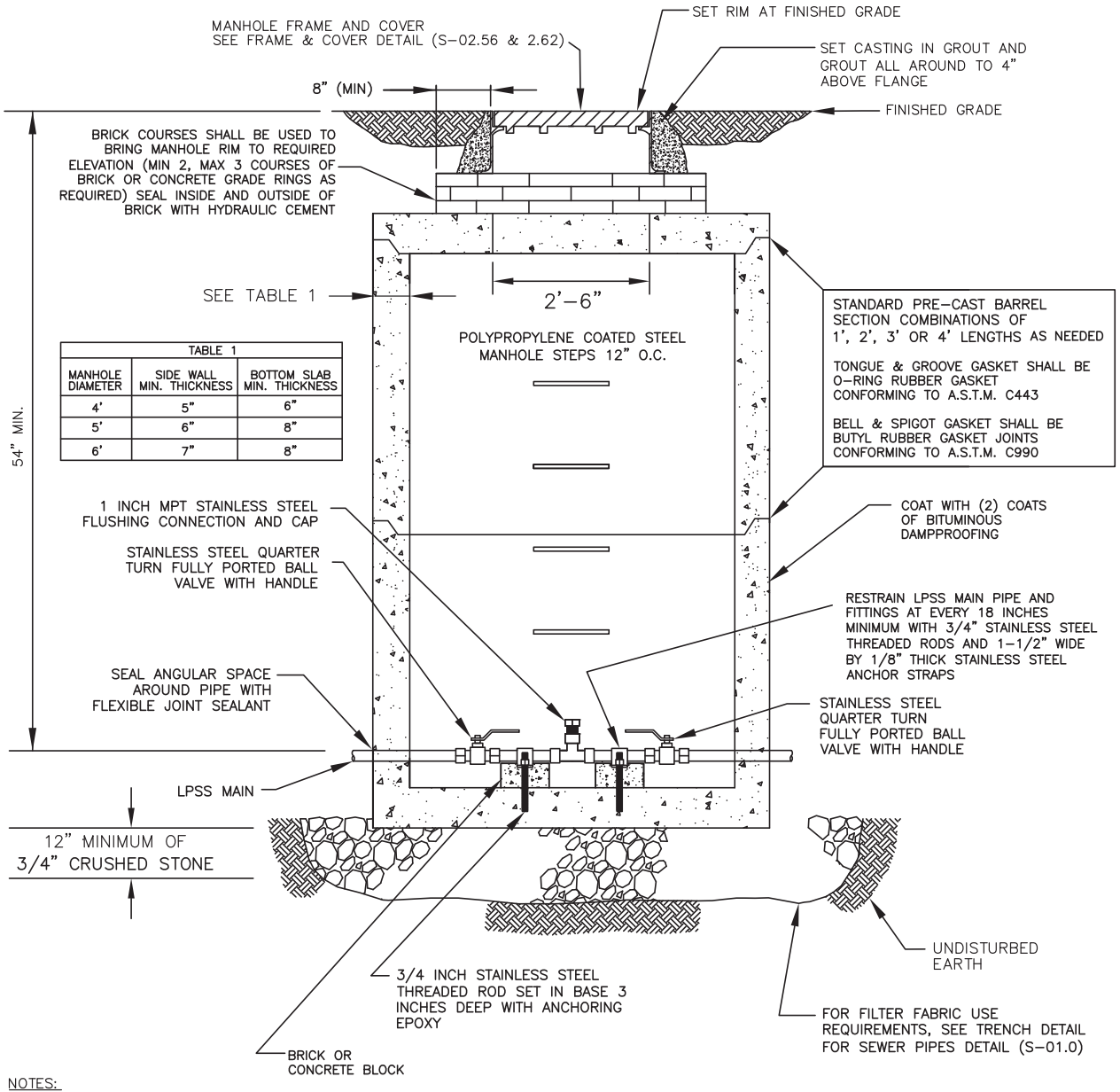


TABLE 1		
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS
4'	5"	6"
5'	6"	8"
6'	7"	8"

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. LPSS MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 54 INCH FROM TOP OF PIPE TO FINISH GRADE.
3. IF 54 INCHES OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.
11. 90 DEGREE BEND FITTINGS ARE NOT ACCEPTABLE. 45 DEGREE BENDS AT INLET AND OUTLET OF MANHOLE SHALL BE INSTALLED WHERE A 90 DEGREE ALIGNMENT CHANGE IS REQUIRED.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-09.4	REV. DATE
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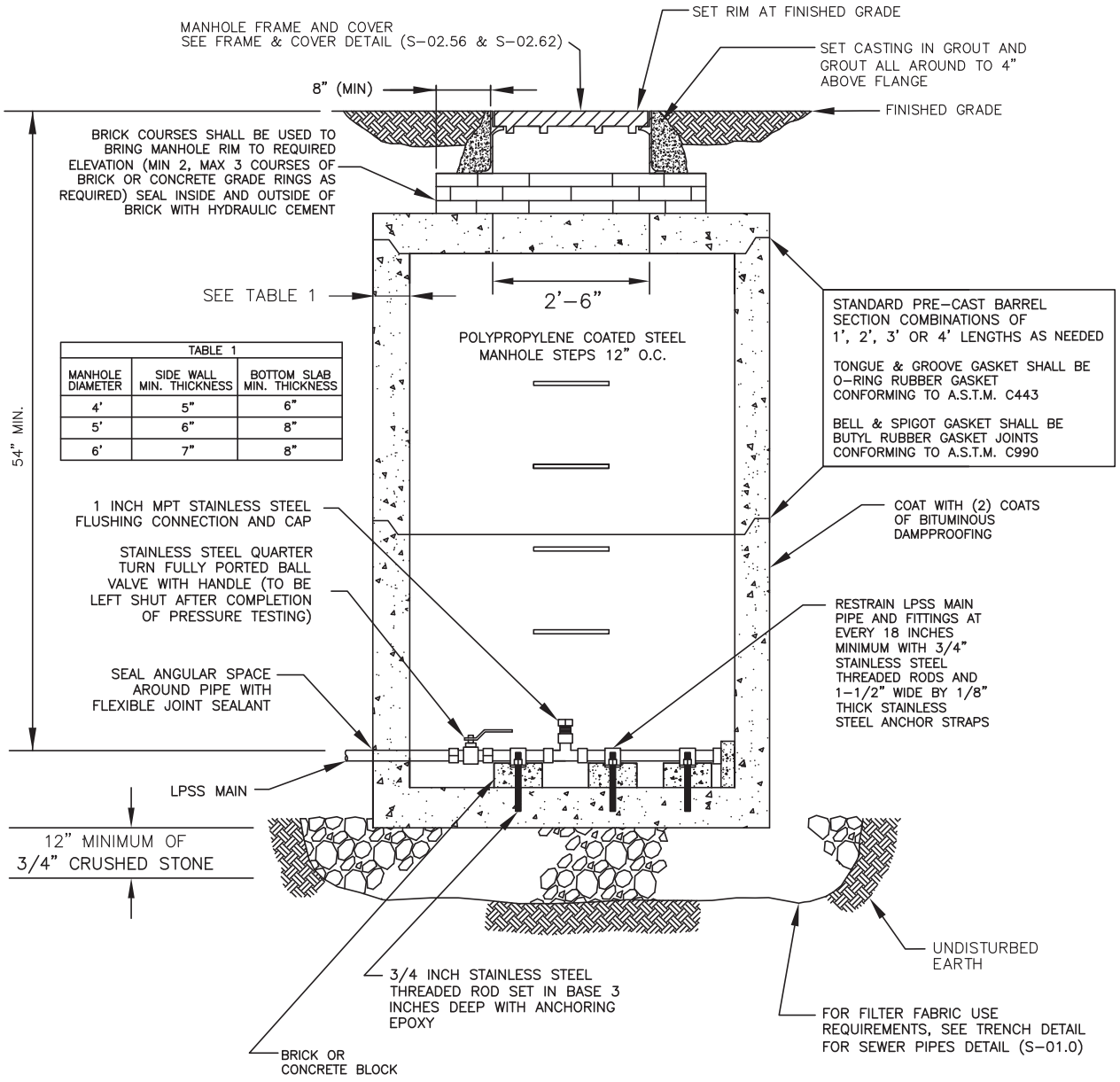


TABLE 1		
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS
4'	5"	6"
5'	6"	8"
6'	7"	8"

NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. LPSS PIPE SHOULD HAVE A MINIMUM DEPTH OF 54 INCHES FROM TOP OF PIPE TO FINISH GRADE.
3. IF 54 INCHES OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

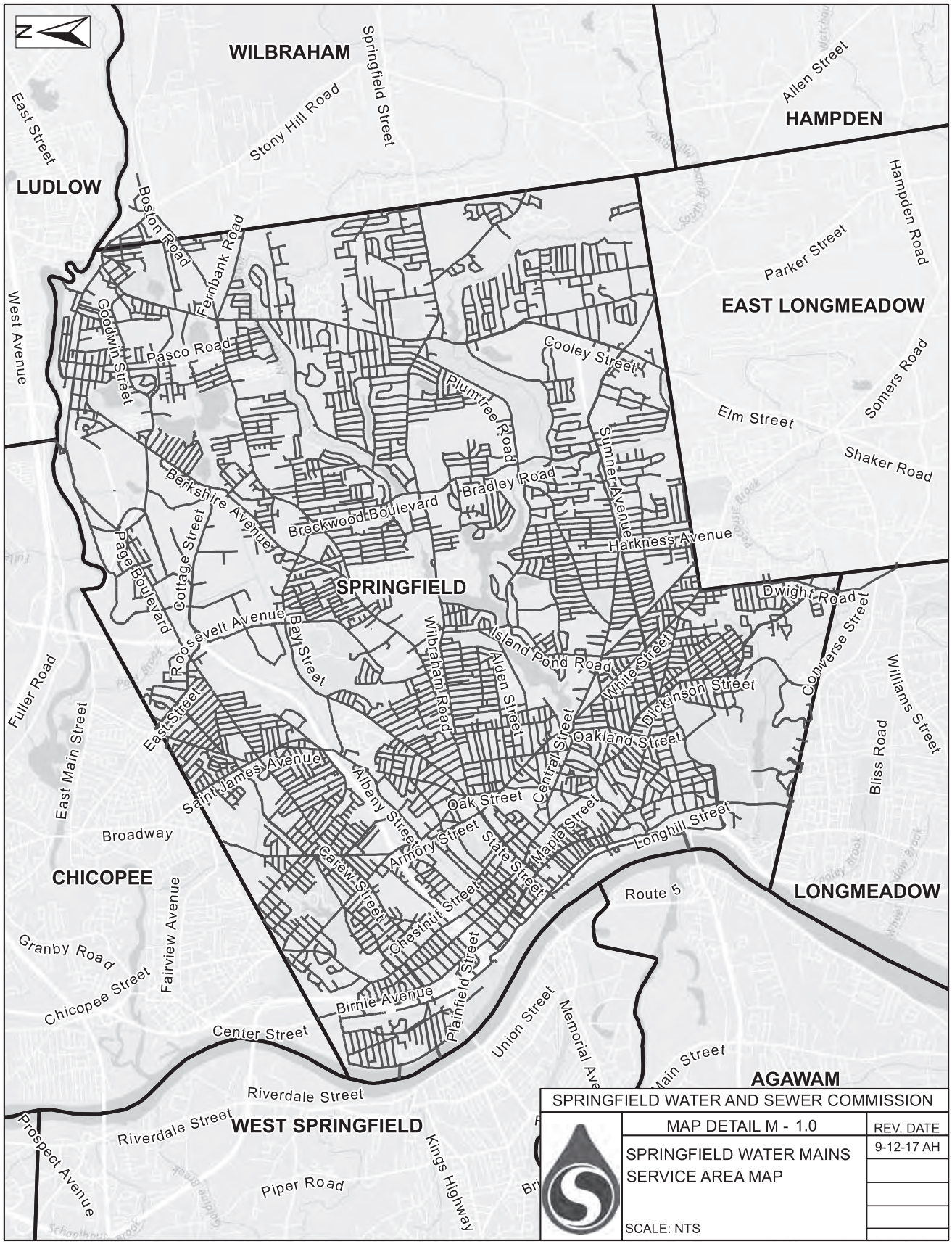
SPRINGFIELD WATER AND SEWER COMMISSION

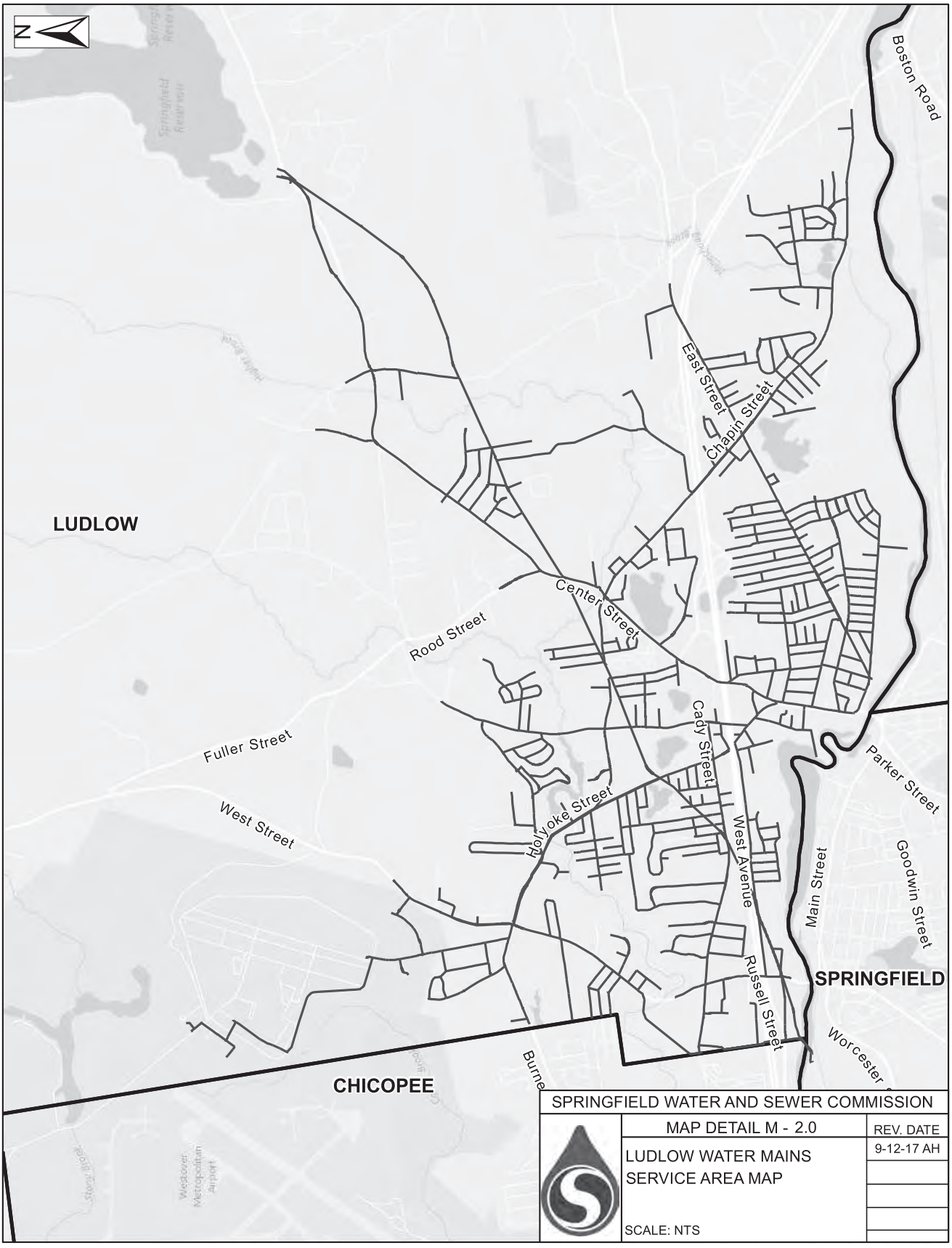
SEWER DETAIL S-09.5

LOW PRESSURE SANITARY SEWER TERMINAL FLUSHING STRUCTURE

SCALE: NTS

REV. DATE
1/23/19 DS


N
WILBRAHAM
HAMPDEN
LUDLOW
EAST LONGMEADOW
SPRINGFIELD
CHICOPEE
LONGMEADOW
AGAWAM
WEST SPRINGFIELD
East Street
Stony Hill Road
Springfield Street
Allen Street
Boston Road
Fernbank Road
Hampden Road
Parker Street
West Avenue
Goodwin Street
Pasco Road
Cooley Street
Plumtree Road
Somers Road
Elm Street
Shaker Road
Berkshire Avenue
Bradley Road
Breckwood Boulevard
Sumner Avenue
Harkness Avenue
Page Boulevard
Cottage Street
Roosevelt Avenue
Bay Street
Wilbraham Road
Island Pond Road
Alden Street
Dwight Road
Converse Street
White Street
Dickinson Street
Williams Street
Bliss Road
Fuller Road
East Main Street
East Street
Saint James Avenue
Albany Street
Oak Street
Central Street
Oakland Street
Maple Street
Longhill Street
State Street
Armory Street
Carew Street
Broadway
Route 5
Granby Road
Fairview Avenue
Chicopee Street
Chestnut Street
Plainfield Street
Birnie Avenue
Union Street
Memorial Ave
Center Street
Main Street
Riverdale Street
Prospect Avenue
Piper Road
Kings Highway
SPRINGFIELD WATER AND SEWER COMMISSION
MAP DETAIL M - 1.0
REV. DATE
9-12-17 AH
SPRINGFIELD WATER MAINS
SERVICE AREA MAP
SCALE: NTS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Boston Road
East Street
Chapin Street
LUDLOW
Center Street
Rood Street
Fuller Street
West Street
Cady Street
Holyoke Street
West Avenue
Parker Street
Main Street
Goodwin Street
SPRINGFIELD
Russell Street
Worcester
Burne
CHICOPEE
SPRINGFIELD WATER AND SEWER COMMISSION
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LUDLOW WATER MAINS
SERVICE AREA MAP
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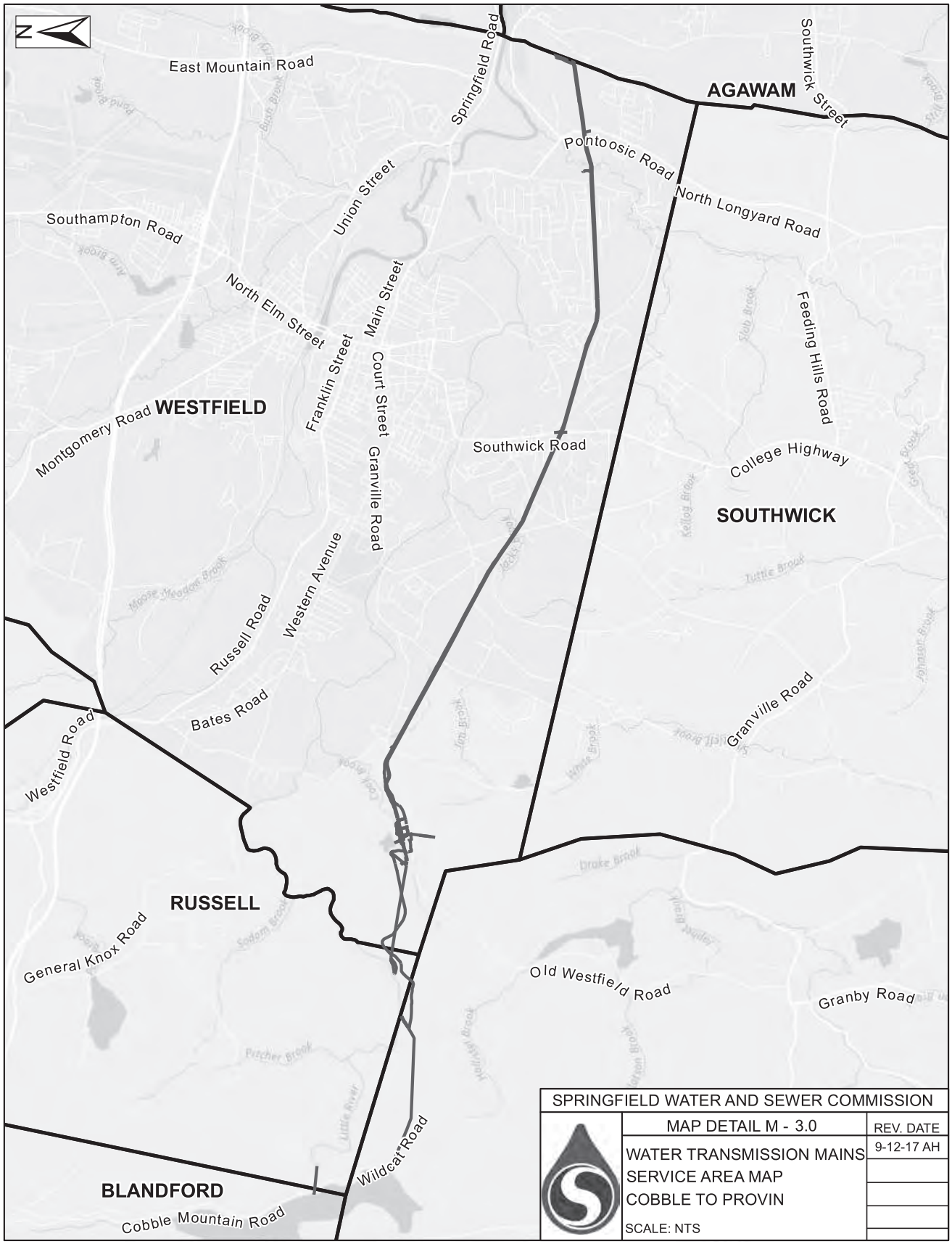
REV. DATE
9-12-17 AH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East Mountain Road
Springfield Road
AGAWAM
Southwick Street
Pontoosic Road
North Longyard Road
Union Street
Southampton Road
North Elm Street
Main Street
Franklin Street
Court Street
Granville Road
Feeding Hills Road
Montgomery Road
WESTFIELD
Southwick Road
College Highway
SOUTHWICK
Western Avenue
Russell Road
Bates Road
Westfield Road
Granville Road
RUSSELL
General Knox Road
Old Westfield Road
Granby Road
Wildcat Road
BLANDFORD
Cobble Mountain Road
SPRINGFIELD WATER AND SEWER COMMISSION
MAP DETAIL M - 3.0
REV. DATE
WATER TRANSMISSION MAINS
SERVICE AREA MAP
COBBLE TO PROVIN
9-12-17 AH
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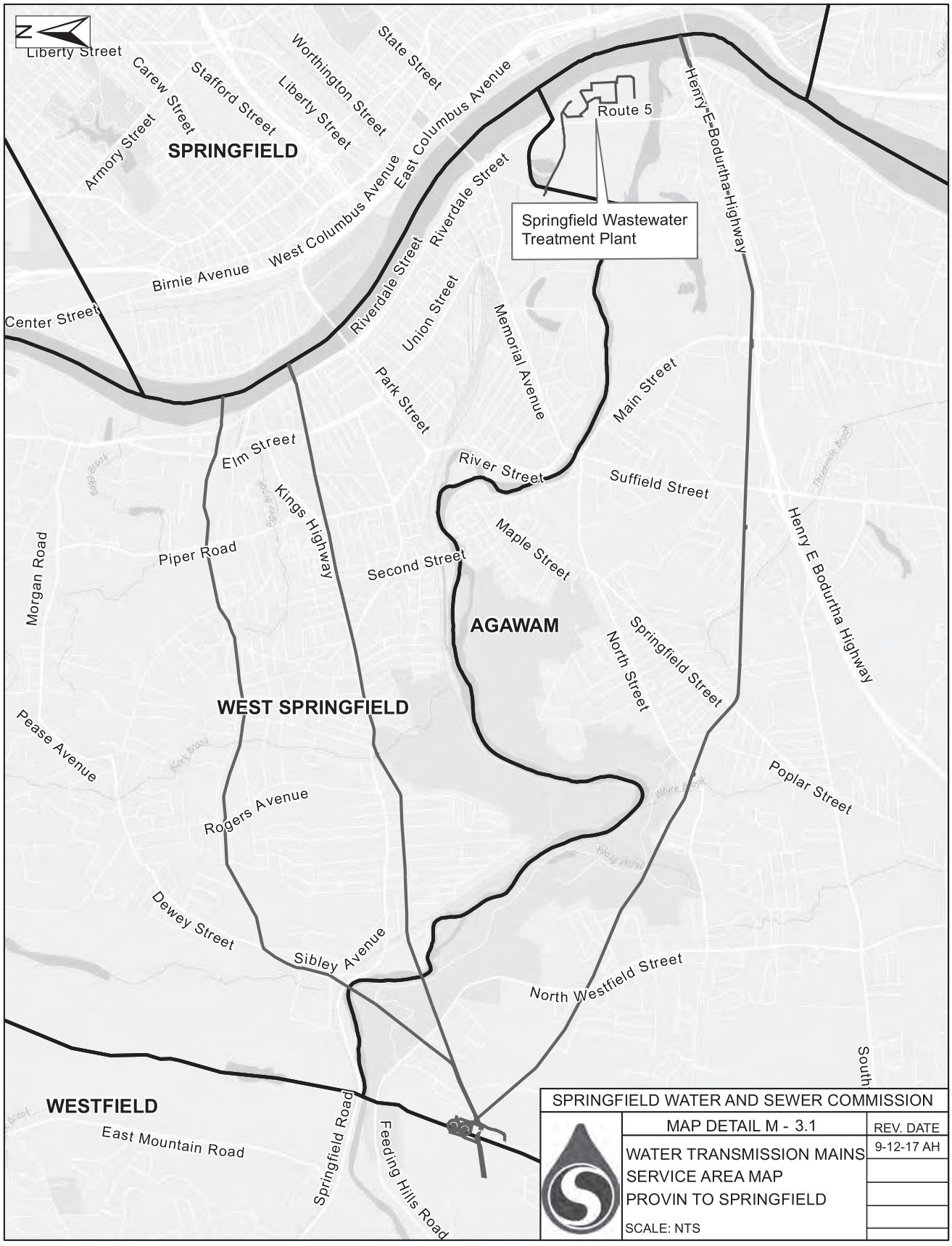
N
Liberty Street
Carew Street
Stafford Street
Worthington Street
State Street
Liberty Street
Armory Street
SPRINGFIELD
East Columbus Avenue
West Columbus Avenue
Route 5
Henry E Boduртha Highway
Springfield Wastewater Treatment Plant
Riverdale Street
Riverdale Street
Birnie Avenue
Center Street
Union Street
Memorial Avenue
Park Street
Main Street
Elm Street
River Street
Suffield Street
Kings Highway
Maple Street
Henry E Boduртha Highway
Morgan Road
Piper Road
Second Street
AGAWAM
North Street
Springfield Street
WEST SPRINGFIELD
Pease Avenue
Poplar Street
Rogers Avenue
Dewey Street
Sibley Avenue
North Westfield Street
South
WESTFIELD
East Mountain Road
Springfield Road
Feeding Hills Road
SPRINGFIELD WATER AND SEWER COMMISSION
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REV. DATE
WATER TRANSMISSION MAINS
9-12-17 AH
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PROVIN TO SPRINGFIELD
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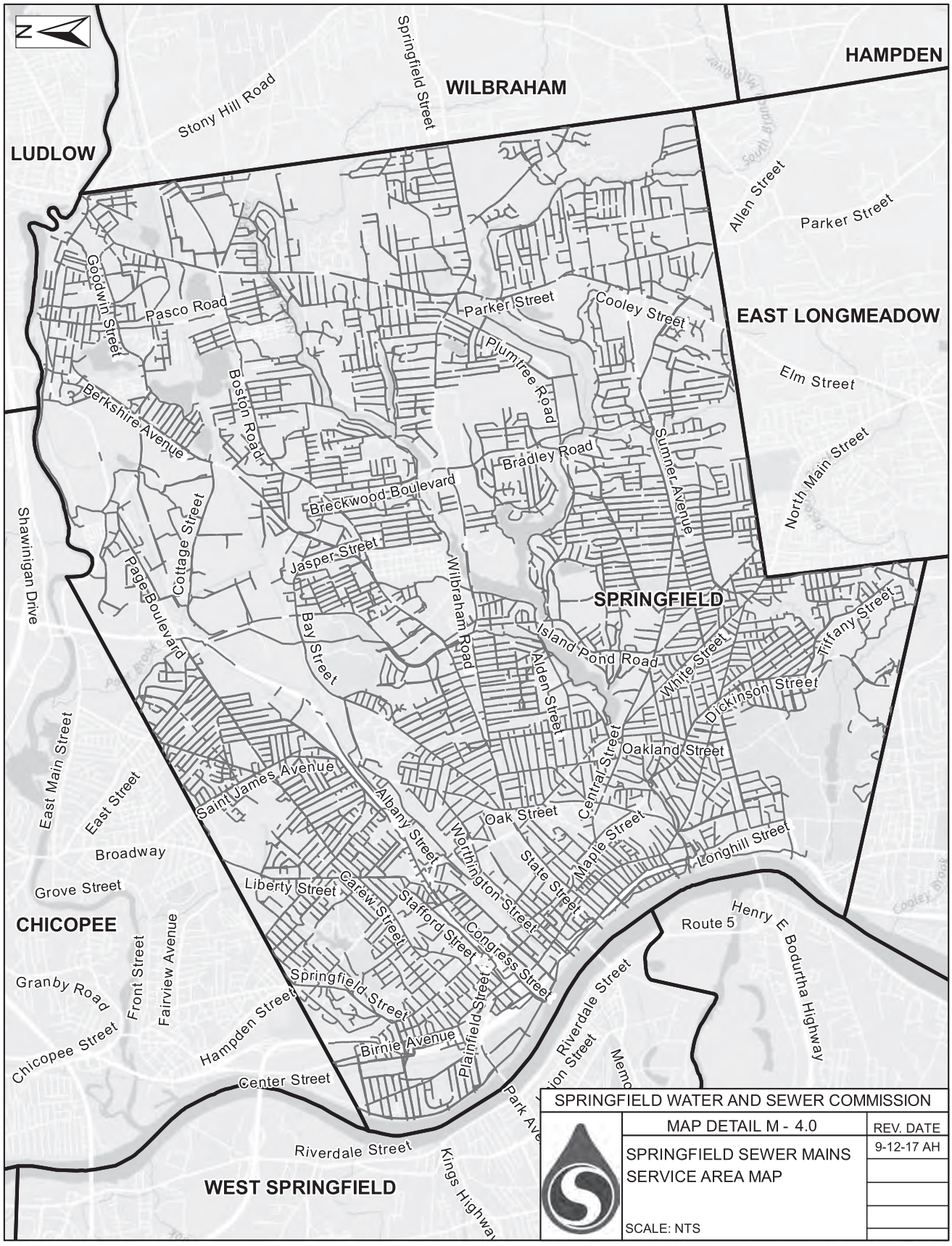

SPRINGFIELD WATER AND SEWER COMMISSION		
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	SCALE: NTS	

DOCUMENT A00885

SPRINGFIELD WATER AND SEWER COMMISSION

GUIDELINES AND POLICIES

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SPRINGFIELD WATER AND SEWER COMMISSION

GUIDELINES AND POLICIES

Version 4 – November 1, 2020

William E. Leonard, Commissioner
Vanessa Otero, Commissioner
Daniel Rodriguez, Commissioner

Springfield Water and Sewer Commission

Guidelines and Policies

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CHAPTER 1 REVISIONS

1. Version 1 of these Guidelines and Policies was written April 1, 2008.
2. Revisions of these Guidelines and Policies as of June 18, 2008

- 4.1.1 - Crossing Policy added and referenced to new Chapter 16
- 4.2.3 - Paragraph 3 Utility Separation defined and added
- 4.3.2 - Paragraph 1 Utility Separation approval added
- 4.3.5 – Surety Release added
- Section 4.5 - ≥ 4-inch Water Services with Backflow Preventer added
- Section 5.1 - Defines who is required to follow Safety guidelines added, Commission issued hard hats and vests, added, class 2 coats added, competent person shall complete Pre-Job checklist added, safety vests shirts & jackets added, questions directed to Safety, Security and Training Manager added, continue to monitor air quality if atmospheric conditions can change added, plate and/or fence open trenches added, and notify Safety, Security and Training Manager of accidents or cave-ins added
- 6.1.1 Paragraph 1 - Dig Permit Required added
- 6.2.1 - Moved all Air Valve Assembly and Air Corp language to last paragraph at end of Section
- 6.2.6 - Clarified when gate valve and butterfly valves may be used added
- 6.3.3 - Check valve replaced backflow preventer on flushing device added
- 7.5.1 - Install jumper wire before removing 5/8-inch – 2-inch meters added
- 7.5.2 – Meter couplings to seal meters and Plastic Meter Pit installations added
- Section 8.4 - Water Valve Box Top Replace and Adjust and Service Box Top Replace and Adjust added
- Section 10.3 - Acceptance of Back Flow Preventers added
- Section 11.4 - Sewer Manhole minimum diameter clarified
- Section 12.1 - Building Sewer Connections clarified
- Section 12.2 - Building Sewer Connection pipe diameters defined
- 15.1.10 - Application for Crossing Commission Transmission Mains added
- Chapter 16 – Crossing Commission Transmission Main and Property Policy added

- Detail W-02.2: Structural Gravel Aggregate changed to Dense Grade Crushed Stone for road base and all paving Type1-I
- Detail W-02.3: Flow fill for Remainder of trench changed to 12-inches of flow fill for road base and all paving Type1-I
- Detail W-02.4: Structural Gravel Aggregate changed to Dense Grade Crushed Stone for road base and all paving Type1-I
- Detail W-02.5: Temporary Trench Backfilling Method for all Streets in Springfield and Ludlow except for Arterial Streets Detail in Springfield
- Detail W-02.6: Temporary Trench Backfilling Method for Arterial Streets in Springfield Detail
- Detail W-06.7: Socket Clamp Detail minimum bolt size increased for 8-inch and 10-inch
- Detail W-10.0: Changed Hose Connection Vacuum Breaker to Check Valve
- Detail W-11.2: Water Meter Sealing Detail added
- Detail S-02.4 Changed tee to cross and required 6-foot minimum inside diameter
- Detail S-03.0: Clarified section views, minimum distance from edge of trench, and require 4-mil poly between pipe and concrete fill

3. Version 2 of these Guidelines and Policies was written March 1, 2019 and include the following revisions.

- Chapter 3. Added all the definitions from R&R
- Chapter 4. Created a Water Detail for Vertical Datum conversions and ask designers to use New City of Springfield datum. The detail provides info to convert to New City datum.
- Chapter 4. Added minimum fire flow requirements for new water main extensions for residential and commercial/municipal/industrial sites.
- Chapter 4. Created Record Sketch and Water Service Card details and instructions how to enter proper info. Described workflow with E&TS and GIS input.
- Chapter 5. Trench Safety – for SWSC employees 4-foot trench requires shoring. For contractors OSHA requirements – 5-feet requires shoring. Contractors to sign attached Safety Assurance form and Indemnity form
- Chapter 5. Updated PPE language to reflect latest memo from KP

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- Chapter 6. Updated Dig Safe requirement per the language on our web page. Added 5 Service Area Maps to help others know where our infrastructure is located. Provide these maps to Jaimye to add to our web page.
- Chapter 6. All ductile iron pipe to be encased on 6-mil polyethylene.
- Chapter 6. Any pipe installed within 200-feet of underground fuel storage tanks need special gaskets
- Chapter 6. Added section on installing insulated pipe underground and overhead
- Chapter 6. Added section on installing temporary bypass including a more descriptive ADA requirement
- Chapter 7. Added section for installing seasonal water services
- Chapter 7. Greater description on how to install 4-inch and larger ductile iron services through the basement wall, into a meter vault, and/or up thru a basement floor
- Chapter 7. Added description on how to install a plastic meter pit for copper tube services
- Chapter 7. Reduced the number of options for large ductile iron meter vaults from four to two: Standard and Oversize
- Chapter 7. Fire Service are required to be in a heated building or enclosure above grade
- Chapter 15. Added Safety Assurance Form. Placed it after the Commission Approved Contractor Form. Moved the Indemnity Form after the Safety Assurance Form so all three are together.
- Chapter 15. Deleted the G&P Acknowledgement Form and Trenching & Safety Form. Safety Assurance Form to replace these.
- Detail W-08.0 Valve Box: Changed backfill material.
- Detail W-08.1 Replace, Raise, or Reset Valve Box: Changed backfill material.
- Detail W-08.2 Raise Valve Box with Riser Detail added
- Detail W-11.0 New Water Service: Added Detail A to include plan view of meter valve types with connections and fittings also added 18-inch from walls and floors.
- Detail W-11.1 Replacement Water Service: Added Detail A to include plan view of meter valve types with connections and fittings also added 18-inch from walls and floors.

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- Detail W-11.3 Plastic Meter Pit For 5/8" – 1" Meters detail added
- Detail W-11.4 Plastic Meter Pit For 1-1/2" – 2" Meters detail added
- Detail W-12.0 Typical Service Box Detail in Paved Areas: Changed backfill materials and clarified brick type.
- Detail W-12.1 Typical Service Box Detail in Non-Paved Areas: Changed backfill materials and clarified brick type.
- Detail W-12.2 Replace, Raise, Or Reset Service Box Detail: Changed backfill materials and clarified brick type
- Detail W-12.3 Raise Service Box with Riser: Added Detail
- Detail W-13.0 Meter Vault Piping: Deleted old drawing and added this detail with more explanation to represent correct install.
- Detail W-13.1 Large Meter Installation: Deleted old drawing and added this detail with more explanation to represent correct install. Clearly identified where adapter flange is located after the meter.
- Details W-13.2 and W-13.3 Standard and Oversize Meter Pit for Ductile Iron Water Service Pipe: Deleted the old W-13.2, W-13.3, W-13.4 and W-13.5 Concrete Meter Vaults and simplified selections to these two.
- Detail W-13.4 Typical Ductile Iron Water Service Detail through Foundation Wall: Added Detail.
- Detail W-13.5 Typical Ductile Iron Water Service Detail through Concrete Floor: Added detail.
- Detail W-16.0 Record Sketch Detail: Added detail.
- Detail W-16.1 Water Service Card Detail: Added detail
- Detail W-17.0 Seasonal Water Service Detail: Added detail and changed vacuum pressure breaker requirements to RPZ if highest sprinkler head is 12-inches or greater above.
- Detail W-17.1 Seasonal Water Service Base Detail: added detail and changed clasp detail.
- Detail W-17.2 Seasonal Water Service Cover Detail: Added detail.
- Detail M-01.0 Springfield Water Mains Service Area Map: Added Detail
- Detail M-02.0 Ludlow Water Mains Service Area Map: Added Detail
- Detail M-03.0 Water Transmission Mains Service Area Map Cobble Mountain To Provin Mountain: Added Detail
- Detail M-03.1 Water Transmission Mains Service Area Map Provin Mountain To Springfield: Added Detail

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- Detail M-04.0 Springfield Sewer Mains Service Area Map: Added Detail

4. Version 3 of these Guidelines and Policies was written July 1, 2020 and include the following revisions.

    - Chapter 2. Sections 2.1.2 and 2.1.4 inserted "Commission's Health and Safety Plan". Throughout document safety language has been relocated to the Commission's Health and Safety Plan.
    - Chapter 4, Sections 4.1.2, 4.1.3, and 4.1.4 deleted "separate application for each water service and/or sewer connection" to ease application procedure and better match what is accepted at Operation Center.
    - Chapter 4, Section 4.2.3 Minimum Design Standards: Paragraph (m) Added Private Yard Hydrant requirements. Paragraph (n) deleted requirement for 45-degree bends and now allow 90-degree bends. Paragraph (p) looped water services and Fire Service Pipes require check valves.
    - Chapter 4, Section 4.4.1 and 4.6.1 changed contact phone number from 787-6206 to 310-3500.
    - Chapter 5. Deleted most of the original safety language.
    - Chapter 5, Section 5.1, General: All employees and Installers to follow Commission's new Health and Safety Plan as well as local, state, and federal regulations including but not limited to Massachusetts Dept. of Labor and OSHA.
    - Chapter 5, Section 5.2, Trenching Excavation: Commission employees will not enter trenches 4-feet or deeper without shoring in place.
    - Chapter 5, Section 5.3, Underground Utility Location (DIG SAFE) Requirements: Site Massachusetts Law to call DIG SAFE before any excavation. Identify Commission service areas for water and sewer maps.
    - Chapter 6, Section 6.1.2, Valve Operations: Tag Out procedures Paragraph (m) deleted "tag out device" in accordance with Commission's Material Specifications". Because it is repeated in Section 6.1.3.
    - Chapter 6, Section 6.1.3, Valve Lock-out: Paragraph 1. Inserted "and OSHA CFR 1910.147 – Control of Hazardous Energy".
    - Chapter 6, Deleted Section 6.1.7, Underground Utility Location (DIG SAFE) Requirements in its entirety and Inserted Existing Underground Utilities and Structures and inserted Paragraph 1 which references Section 5.3 of these G&P.
    - Chapter 6, Section 6.2.7, Ductile Iron Mechanical Joint fittings: Deleted Paragraph 8. in its entirety. Two 45-degree bends were required in past, but

during review of a project the loss of head through one 90-degree bend was found to be equal or less.

- Chapter 6, Section 6.4.3, Pressure and Leakage Test: Paragraph 2. Deleted "200-PSI or 2x" and replaced with "150-PSI or 1-1/2times" as this is what AWWA suggests.
- Chapter 7, Water Services, Section 7.1.1, General: Inserted Paragraph 5. "Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission's Health and Safety Policies".
- Chapter 7, Water Services, Section 7.2.3, Copper Tubing: Inserted Paragraph 8. "Copper tubing water services installed with less than 18-inches of tubing beyond the wall or above the floor shall be reinstalled in its entirety by the Installer." This allows for room to work on meters.
- Chapter 7, Water Services, Section 7.2.5, Compression Coupling: Inserted Paragraph 4. "No couplings are allowed before meter valves in building." This reduces chance of leaks and makes sure meter is restrained.
- Chapter 7, Water Services, Section 7.2.6, Service Boxes: Deleted "magnetized and" Inserted "after installation." Magnetized boxes are no longer available or required and SWSC paints new WS boxes blue after installation.
- Chapter 7, Water Services, Section 7.4.1, Replacement of Existing Water Service Pipe, Paragraph 5.: Inserted Paragraphs (a) Installer shall open cut all water services from main to home/building and replace Water Service Pipes in accordance with Section 7.3 of these Guidelines and Policies and (b) Commission Construction Crews or Commission Approved Contractors hired by the Commission to replace water service may pull Water Service Pipes in accordance with this Section of these Guidelines and Policies." This clarifies Installers/Commission Approved Contractors shall open cut and Commission Approved Contractors hired to install Commission CIP projects may install water service pipes by pulling the pipe
- Chapter 7, Water Services, Section 7.4.3, Product Installation – Existing Water Service Pipe, Paragraph 4.: inserted "or replace by open trench". This paragraph directs abandonment in place of replacement by open trench to Section 7.3.
- Chapter 7, Seasonal Water Services, Section 7.5.2, Product Installation – Seasonal Water Services 2-inch and less, Paragraph 7. (g).: Inserted A testable Pressure Vacuum Breaker assembly (PVB) is allowed when the PVB can be installed at least 12 inches or greater above the highest sprinkler head. A PVB is designed to prevent only back-siphonage and is designed for use under static line pressure. A PVB is not allowed where back-pressure is

possible. A Reduced Pressure Zone assembly (RPZ) is required when a PVB does not meet the installation requirements. A single spigot is allowed on the downstream side of a RPZ and on the downstream side of a PVB installed 12 inches below the PVB. (The highest sprinkler head and/or fixture shall be 12-inches or greater below the PVB. If it is less than 12-inches a RPZ is required.)"

- Chapter 7, Water Services, Section 7.4.3, Product Installation – Existing Water Service Pipe, Paragraph 5.: Inserted after service "by pulling the old and new water service pipe shall be allowed as follows:"
- Chapter 11, Deleted Section 11.1.5, Underground Utility Location (DIG SAFE) Requirements in its entirety and Inserted Existing Underground Utilities and Structures and inserted Paragraph 1 which references Section 5.3 of these G&P.
- Detail W-08.0 Valve Box: Clarified type of brick under base.
- Detail W-08.1 Replace, Raise, or Reset Valve Box: Clarified type of brick under base.
- Details W-13.6, W-13.7, W-13.8, W-13.9 and W-13.10 are various approved frames and covers for Meter Vaults: Deleted the old W-13.6 32" x 8" Water Frame and Cover to expand options for SWSC.
- Detail W-15.0 Relation of Vertical Datums To Springfield City Base: Added detail and added conversion to MWRA and Boston City Base.
- Details S-02.51, S-02.52, S-02.53, S-02.54, S-02.55 and S-02.56 are various approved frames for sewer manholes and S-02.61, S-02.62, S-02.63, S-02.64, S-02.65 and S-02.66 are various approved sewer covers: Deleted the old S-02.5, S-02.6, and S-02.7 sewer frame and covers to expand options for SWSC.

5. Version 4 of these Guidelines and Policies was written November 1, 2020 and include the following revisions.

    - Chapter 4. APPPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS, Section 4.2.3 Minimum Design Standards, Paragraph 1, (p) 4-inch – 12-inch Water Service, 9th bullet: added OS&Y GV required as a building control valve before BFP or assembly. 10th bullet: Fire Services may have OSY gate valves or B-fly valves with either flange or grooved connections on both sides of the assembly.

The above changes were made to clarify what was acceptable on fire services and the BFP requirements for the same. Grooved (Victaulic) connections will now be allowed along with flanged connections. Butterfly valves will now be allowed along with OS&Y gate valves.

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- Chapter 4. APPPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS, Section 4.4.2 Commission Responsibilities Prior to Arriving at the Installation, Paragraph 4 was edited to clarify 2 inspections for water service and two inspections for sewer connections. Refunds would be credited to account if all charges were not used. Paragraphs 5 and 6 were deleted as this will no longer apply since SWSC billing software cannot share costs. The intent is to have the contractors ready for inspection so SWSC Inspectors not going to site and installation is not ready.
- Chapter 4. APPPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS, Section 4.5 Inspections for 4-inch and Larger Water and Fire Service Installations, 4.5.4 Water or Fire Service into Service, Paragraphs added 1(a), 1(b), and edited 1(c); as follows;

  1(a): Water Services or Fire Services up to 2-inch the Installer shall have the correct meter valve installed before any testing being scheduled.

  1(b): For metered Water Services 4-inch and larger that require a Back Flow Preventer the Installer shall have the correct Outside Spindle and Yoke (OS&Y) gate valve (building control valve) installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve onto the first flange into the building for testing. The Installer may then schedule testing.

  1(c): For Fire Services 4-inch and larger the Installer shall have the correct OS&Y gate valve installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve The Installer may then schedule testing.

The above additions and edits were made to ensure a correct valve in accordance with SWSC Material Specifications is installed prior to any testing. For Water Services or Fire Services up to 2-inch a meter valve in accordance with SWSC Standard details is required. For 4-inch and larger metered Water Services a F x F OS&Y gate valve is required before any testing or meter installation is scheduled. This is not a change just a clarification. For 4-inch and larger Fire Services a F x F OS&Y gate valve is required before any testing or backflow preventer installation is scheduled. This valve will be referred to as a building control valve. This is new. All installations by the site contractor should be from the main to the first valve (building control valve or meter valve) in the building. Testing will be completed with a temporary companion (blank) flange bolted to the outlet side of the valve flange. The blank flange shall have a 2-inch threaded outlet and a 2-inch ball valve for leak testing, flushing Fire Dept. flushing, and bacteria testing.

- Chapter 7. WATER SERVICES, Section 7.2 Water Service 2-inch and less, 7.2.2 Ball Type Corporation Stops, Paragraphs 2 and 3; Changed 1-inch Direct Taps to none. Reason being SWSC makes the taps and no longer has

equipment to direct tap so all 2-inch and less shall be through a tapping saddle supplied by the Installer.

- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, Paragraphs 2; added Paragraphs (a) and (b) which defined devices as the back flow preventer only and assemblies are from the manufacturer and include two isolation valves with the back flow preventer.
- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, Paragraphs 4; deleted bullet "All facilities listed in Paragraph 3, above shall have two (2) BFP devices installed, unless otherwise approved by the Commission" which was repetitive as Paragraph 3 already defined which type of facilities required a BFP at meter and at point of use in the facility.
- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, Paragraphs 5; added "and assemblies" after Devices and added "in a horizontal position at least" after installed to clarify devices and assemblies must be installed in a horizontal position.
- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, added Paragraphs 7., 8., 9., 10., 11., 12., and 13; These additions and edits were made to ensure a correct valve is installed prior to any testing and the correct device with valves or assembly, connection types, and connection hardware are installed after all successful testing. For Water Services or Fire Services up to 2-inch a meter valve in accordance with SWSC Standard details is required. For 4-inch and larger metered Water Services a F x F OS&Y gate valve is required before any testing or meter installation is scheduled. This is not a change just a clarification. For 4-inch and larger Fire Services an F x F OS&Y gate valve in accoerdance with the SWSC's Material Specifications is required before any testing or backflow preventer installation is scheduled. This valve will be referred to as a building control valve. This is new. All installations by the site contractor should be from the main to the first valve (building control valve or meter valve) in the building. Testing is defined in Section 4.5.4 and will be completed with a temporary companion (blank) flange bolted to the outlet side of the valve flange. The blank flange shall have a 2-inch threaded outlet and a 2-inch ball valve for leak testing, flushing Fire Dept. flushing, and bacteria testing.
- Detail W-11.0 New Water Service: Corrected 12-inch to 18-inch from floors.
- Detail W-11.1 Replacement Water Service: Corrected 12-inch to 18-inch from floors.
- Detail W-13.11 Typical Ductile Iron Fire Service Detail Through Foundation Wall: Added to help clarify fire Service Installations.
- Detail W-13.12 Typical Ductile Iron Fire Service Detail Through Floor: Added to help clarify fire Service Installations.

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- Detail W-13.13 Typical Ductile Iron Fire Service Detail in a Hot Box: Added to help clarify fire Service Installations.
- Detail W-13.14 Typical DIP Commercial & Industrial Service Detail Through Foundation Wall: Added to help clarify fire Service Installations.
- Detail W-13.15 Typical DIP Commercial & Industrial Service Detail Through Floor: Added to help clarify fire Service Installations.
- Detail W-11.3 Plastic Meter Pit for 5/8" – 1" Meters: Added 2" hole with automatic meter reading plug for electric reading device.
- Detail W-11.4 Plastic Meter Pit For 1-1/2" – 2" Meters: Added 2" hole with automatic meter reading plug for electric reading device.
- Detail S-04.0 Existing Sewer Main to Building Connection: Removed "long sweeps" as PVC bends are typically installed. Clarified cleanouts required every 100' and upstream of horizontal deflection ≥ 45-degrees.
- Detail S-04.1 New Sewer Main to Building Connection: Removed "long sweeps" as PVC bends are typically installed. Clarified cleanouts required every 100' and upstream of horizontal deflection ≥ 45-degrees.
- Detail S-04.2 Clean Out with Sweep: Clarified cleanouts required every 100' and upstream of horizontal deflection ≥ 45-degrees.

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CHAPTER 2 GENERAL PROVISIONS

2.1.1 Introduction

1. These Guidelines and Policies will govern all work performed in the Springfield Water and Sewer Commission's (Commission) transmission and distribution systems.
2. The only persons allowed to work on the Commission's water transmission, water distribution systems, and/or sewer collection system are as follows:
   (a) The Commission's own employees (Commission Construction Crew),
   (b) Contractors hired directly by the Commission (Installer),
   (c) Commission Approved Contractors (Installer) hired by an Owner of a property in the Commission's Service Area
3. When there is a conflict between these Guidelines and Policies and other referenced standards then these Guidelines and Policies shall govern.
4. The Guidelines and Policies contained herein are in accordance with Commission's Rules and Regulations.
5. Commission Guidelines and Policies do not supplant the Installer's obligation to comply with the Department of Labor, and Occupational Safety and Health Administration regulations. Construction site safety is the Installer's responsibility.
6. Questions regarding construction or other activities will be directed to the Commission's Authorized Field Representative or in accordance with Section 2.1.8 of these Guidelines and Policies.
7. All Installers hired by Owners shall become Commission Approved Contractors to perform work in the Commission's Service Area.
8. Failure of any Commission employee to comply with these Guidelines and Policies may result in disciplinary action and possible termination.
9. Failure of a Commission Approved Contractor or Installer to meet the requirements of these Guidelines and Policies may result in removal of the Commission Approved Contractor's name from the approved list.
10. Failure of a Commission employee, Commission Approved Contractor, or Installer to meet the requirements of these Guidelines and Policies may

additionally result in fines in accordance with the Commission's Rules and Regulations.

11. The Commission reserves the right to remove anyone from the Commission Approved Contractors list for any reason. If a Commission Approved Contractor is removed from the list, that contractor shall not be allowed to perform any work in the Commission's Service Area.

2.1.2 Review of these Guidelines and Policies

These Guidelines and Policies will be reviewed annually and revised as necessary. In addition, if a near miss or incident occurs, CHAPTER 5 SAFETY of these Guidelines and Policies and the Commission's Health and Safety Policies, will immediately be reviewed and revised if necessary.

2.1.3 Maintenance of these Guidelines and Policies

1. These Guidelines and Policies will be revised and updated by the Commission's Engineering and Technical Services.

2. At a minimum, the Version Number of these Guidelines and Policies, the Chapter and Section, and the date of last Revision shall be recorded in CHAPTER 1 of these Guidelines and Policies.

2.1.4 Acknowledgement of Safety Assurance Form

Commission Approved Contractors and Contractors hired by the Commission shall read CHAPTER 5 SAFETY of these Guidelines and Policies and the Commission's Health and Safety Policies, and sign the attached Safety Assurance Form in CHAPTER 15 of these Guidelines and Policies,

2.1.5 General Installer Responsibilities

1. The Installer proposing to perform construction in the Commission's Transmission and/or Distribution System and who executes the appropriate paperwork with the Commission, to allow the same, shall conform to the following:

   (a) Furnish all water pipe, hydrant, assemblies, valves and valve boxes, fittings, couplings, backfill materials, concrete thrust blocking, labor, tools, and equipment necessary to lay and joint all pipe in accordance with the Commission's Specifications and these Guidelines and Policies.

   (b) All construction shall conform to the design provided by the Commission's Engineering and Technical Services (E&TS), the design provided by the

Owner and approved by the Commission, or the Commission's Authorized Field Representative.

(c) All contracts, deposits, applications, and easements will be finalized before the Commission E&TS will schedule inspection.

(d) Prior to job start, all main and service materials and area of land to be developed will be subject to inspection by an Authorized Field Representative of the Commission.

(e) All work related to services and inspections provided by Commission will be subject to fees and will be the responsibility of the Owner.

(f) The Owner is responsible for obtaining and using the most recent Material Specifications of the Commission.

(g) The Owner is responsible for obtaining and using the most recent copy of these Guidelines and Policies.

2. The most recent versions are available on www.springfieldwaterandsewer.org.

3. The Commission shall be notified one week prior to the start of a project to schedule inspection.

2.1.6 General Commission Construction Crew Responsibilities

1. The Commission Construction Crew performing construction in the Commission's Transmission and/or Distribution System shall conform to the following:

(a) Furnish all water pipe, hydrant, assemblies, valves and valve boxes, fittings, couplings, backfill materials, concrete thrust blocking, labor, tools, and equipment necessary to lay and joint all pipe in accordance with the Commission's Specifications and these Guidelines and Policies.

(b) All construction shall conform to the design provided by the Commission's Engineering and Technical Services (E&TS), the design provided by the Owner and approved by the Commission, or the Commission's Authorized Field Representative.

(c) Prior to job start, all main and service materials and area of land to be developed will be subject to inspection by an Authorized Field Representative of the Commission.

(d) All work related to services and inspections provided by Commission will be subject to fees and will be the responsibility of the Owner.

(e) The Commission Construction Crew is responsible for obtaining and using the most recent Material Specifications of the Commission.

(f) The Commission Construction Crew is responsible for obtaining and using the most recent copy these Guidelines and Policies.

2. The most recent versions are available on www.springfieldwaterandsewer.org.

3. The Commission shall be notified one week prior to the start of a project to schedule inspection.

2.1.7 Material Approval

1. All materials shall meet to the Commission's Material Specification and/or the Commission's Authorized Field Representative's approval.

2. At an minimum all the components and chemicals that will come in contact with drinking water shall meet the requirements of the following:

   (a) American Water Works Association

   (b) Massachusetts Department of Environmental Protection

   (c) NSF/ANSI Standards 60 (Drinking Water Treatment Chemicals)

   (d) NSF/ANSI Standards 61 (Drinking Water Components).

3. When the quality of any material is questioned, it will be the Commission's Construction Crew's or the Installer's responsibility to prove to the Commission's Authorized Field Representative's satisfaction that the materials in question comply with the Commission Material Specifications.

4. Materials that, in the Commission's Authorized Field Representative's opinion, are damaged, mishandled, or defective shall be rejected from use on the job.

5. Materials that have been rejected from use by the Commission's Authorized Field Representative shall be immediately removed from the construction site.

2.1.8 Clarification of Issues – Who to Call with Questions

1. For general questions relating to the Springfield Water and Sewer Commission call the Commission's Field Services Office @ 413-310-3500.

2. For questions relating to filling, flushing, and disinfecting water mains, and other water quality related issues call the Water Quality Manager @ 413-310-3500

3. For questions relating to scheduling, valve operations, water & sewer main installations or repairs, water & sewer service installations or repairs, hydrant flow tests, hydrant meter rentals, facilities mark out, Commission Approved Contractor, and other construction related issues call the Commission's Field Services Office @ 413-310-3500.
4. Questions relating directly to these Guidelines and Policies or Material Specifications call Engineering and Technical Services @ 413-452-1300.
5. Questions relating to **main extensions only** call the Commission's Construction Inspectors Group @ 413-452-1300.

2.1.9 Reference to Guidelines & Policies

These guidelines and policies may be referred to as the Commission's Guidelines and Policies.

2.1.10 Severability

The provisions of these Guidelines and Policies are severable. If any provision of these Guidelines and Policies or any specific application to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications, which can be given effect in the absence of the invalid provision or application.

2.1.11 Applicable Regulations

Every user of the public water system, private water mains, public sewer system, or private sewer mains shall be subject to regulations of the Commission, as they apply, and to any charges, rates, fees and assessments which are or may be established by the Commission. Any user of the public water system, private water mains, public sewer system, or private sewer mains shall also be subject to applicable Local, State, and Federal regulations.

2.1.12 Reference Standards

Where reference is made to one of the below standards, the revision in effect at the time is applicable.

1. American Concrete Institute (ACI)
2. American Iron and Steel Institute (AISI)
3. American National Standards Institute (ANSI)
4. American Society of Testing and Materials (ASTM)
5. American Water Works Association (AWWA)

6. American Welding Society (AWS)
7. Ductile Iron Pipe Research Association (DIPRA)
8. Manufacturing Standardization Society of the Valve and Fittings (MSS)
9. National Fire Protection Association (NFTA)
10. NSF International (NSF)

Springfield Water and Sewer Commission

Guidelines and Policies

CHAPTER 3 DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in these Guidelines and Policies shall be as follows:

1. Abutter means one who holds titles to real property within the limits of a Sewer Improvement Area and his/her successors in title.
2. Additional Meter shall mean a meter for the purpose of determining sub-divisions of supply through master meters and are owned and maintained by the Owner.
3. Applicant shall mean any Owner or duly authorized Owner's agent applying for any services provided by the Commission.
4. Application Fee shall mean the fee charged to apply for any Water Facility, Fire Flow Test, and/or Sewer Facility, in accordance with the Commission's Rules and Regulations. A single Application Fee will be charged for both water and sewer main extensions provided they are applied for at the same time. New Water Service Pipes, Fire Service Pipes, and Building Sewer Connections Application Fees shall be separate and in addition to any main extensions.
5. Application Fee to Review Crossing Commission Property shall mean the fee charged to review plans, specifications, and easements and inspect the crossing of Commission owned property.
6. Appurtenances shall mean any piece of water and/or sewer infrastructure that is not a water or sewer main, service pipe, or hydrant, such as: a check valve, pump, meter, storage tank, dam, and/or other water or sewer treatment facility.
7. As-Built Plan Fee shall mean the Fee charged for as-built plans. The Commission will return the Fee upon receipt of completed as-built plans. The as-built plans shall be provided to the Commission within 120 days after the final acceptance of a water and/or sewer main installation and /or a water and or sewer service installation.
8. Authorized Field Representative shall mean any Commission employee or Person hired by the Commission to oversee an activity on the Commission's water transmission system, water distribution system, or waste water collection system.
9. Automatic Meter Reading Device (AMR) shall mean a device(s) used for reading a water meter without having to enter a premise.
10. Auxiliary Meter shall mean a meter for the purpose of determining water use for lawn sprinklers or other approved process use and are owned and maintained by the Commission. Auxiliary Meters in Ludlow shall be owned and maintained by

the Owner and are subject to Commission inspection in accordance with the Commission's Rules and Regulations.

11. Backflow Prevention Device (BFP) shall mean an approved mechanical device designed to prevent Backflow.

12. Backflow shall mean the flow of water or other fluids, mixtures or substances into the distribution pipes of a potable supply of water from any source or sources other than its intended source.

13. Best Management Practices (BMP) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions as listed in the Commission's Rules and Regulations. BMP include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

14. Building Drain means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and/or other stacks inside the building and terminates ten (10) feet outside the inner face of the building wall. The Owner owns and shall operate and maintain the Building Drain from the building to the Building Sewer.

15. Building Sewer means sanitary sewer and that part of the horizontal piping, which begins ten (10) feet outside the inner face of the building wall and extends to a Public Sewer, Private Sewer or other place of Wastewater disposal. The Owner owns and shall operate and maintain the Building Sewer from the Building Drain to the main.

16. Building shall mean any roofed and walled structure.

17. Categorical Industrial User shall refer to industrial users subjected to EPA categorical pretreatment standards.

18. Charges means all fees, rates, rents, assessments, or liens for water, sewer, drainage or other services, facilities and commodities which are furnished or supplied by the Commission and for which it is authorized under MGL 40-N to assess.

19. City shall mean the City of Springfield, Massachusetts.

20. Combined Service shall mean a service pipe that is used to provide both Water Service and private fire protection service.

21. Combined Sewer means a Sewer receiving and conveying both sanitary Wastewater and surface runoff from storms.

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22. Commercial shall mean a classification of Water Users and/or Wastewater Users that are engaged in providing products or services, whether to the general public or to its members, which includes all retail and wholesale establishments, businesses, and offices, including but not limited to office buildings, retail and wholesale outlets, service agencies, agents, brokers, professional offices, stores, cafes, theaters, bakeries, bus terminals, warehouses, store-houses, hotels, motels, restaurants, rooming-houses, trailer parks, funeral parlors, garages, farming, gas stations, newspapers, churches, private schools and colleges, Medical Facilities, libraries, museums, cemeteries, not-for-profits, homes for aged and children, State buildings, State facilities, builder's use- metered and un-metered, water tankers. Property, which contains both Residential and Commercial Water Users, shall be classified as Commercial.

23. Commission Approved Contractor Application Fee shall mean the fee charged to review the qualifications and experience of the Persons seeking to become Commission Approved Contractors. The Fee is non-refundable. This Fee is for review of the Application Form and for the term of the approval period. The approval period shall be for a term of three (3) years. Each approval period shall begin immediately after the previous approval period ends. Applications and Fees can be submitted any time before or during the approval period, but shall be for the existing approval period and must be resubmitted for each approval period.

24. Commission Approved Contractor Application Renewal Fee shall mean the fee charged to review the qualifications and experience of the Persons seeking to renew their Commission Approved Contractors status at the end of the previous approval period. All other provision of the approval process shall remain the same.

25. Commission Approved Contractor shall mean any Contractor approved by the Executive Director in accordance with the Commission's Guidelines and Policies to provide a construction service for an Owner. All approved contractors shall have appropriate bonding, insurance, and experience with references to perform work on the Commission's water distribution system, sewer collection system, and water and/or sewer services on behalf of the Owner.

26. Commission Construction Crew shall mean construction personnel regularly employed by the Commission to install, maintain, repair, and replace water and sewer infrastructure in accordance with the Commission's Rules and Regulations, these Guidelines and Policies.

27. Commission means the Springfield Water and Sewer Commission, an independent body politic and corporate and political subdivision of the Commonwealth of Massachusetts created under MGL 40-N as adopted by the City of Springfield on March 28, 1996, the powers of which are exercised by a board of three members

appointed in accordance with the MGL 40-N, and includes without limitation all its departments, divisions and Sections or pertaining or belonging to said Commission.

28. Commissioners refers to a board of three appointed members who shall govern the Commission as set forth in MGL 40-N.

29. Critical Valves shall mean any valve 20-inch or larger or as determined by Engineering and Technical Services that has the ability to severely impact the SWSC's transmission system, storage system, distribution system, pump stations, and/or significant customers; such as Wholesale (Towns) Customers, Medical Facilities, and/or Industrial/Commercial/Institutional Customers

30. Cross Connection shall mean any actual or potential connection between a distribution pipe of potable water supplied by the public water system and any waste pipe, soil pipe, sewer, drain or any other unapproved source. Without limiting the generality of the foregoing, the term "cross connection" shall also include any bypass arrangement, jumper connection, removal section, swivel or changeover connection and any other temporary or permanent connection through which Backflow can or may occur.

31. Customer means a Person or entity listed on the records of the Commission as the party of record responsible for payment of Bills for Charges for water and Sewer services to the Premise/Property.

32. Customer Water Service shall be defined as the entire water service excluding any corporation stop and/or valves directly associated with the water main. The Customer will be assessed for any repairs, replacements, or other services rendered to the Customer Water Service.

33. Developed Property means property that generates wastewater.

34. Discontinuance shall mean a temporary cessation of Water Service at the Premise at the request a Customer for reasons other than ordinary repair or maintenance.

35. Domestic Wastewater means the liquid Wastes and liquid borne Wastes discharged from the sanitary conveniences such as toilets, washrooms, urinals, sinks, showers, drinking fountains, laundry rooms, kitchens, cafeterias and floor drains essentially free of industrial Wastes or toxic materials.

36. Drain For the meaning of “Drain,” see “Storm Drain.”

37. Dry Industry shall mean a classification of Wastewater Users which includes all industries which do not use water for processes, do not use large volumes of water

for cleaning, or for which total annual wastewater production is less than one hundred thousand (100,000) cubic feet.

38. Easement shall mean an acquired legal right for the specific use of land owned and maintained by others, whether recorded or by prescription.

39. EPA means United States Environmental Protection Agency.

40. Executive Director means the Executive Director of the Commission or his/her Authorized Field Representatives.

41. Facilities include structures, conduits, pumping stations, treatment and disposal works, and other appurtenances for the purpose of collecting, treating and disposal of domestic and/or Industrial Wastewater.

42. Fire Department Permit to shut off sprinkler system shall mean the completed permit approved by the Fire Department and submitted to the Commission by the Owner or by the Owner's agent prior to demolition of any building having water or fire suppression system connections to the Commission's water system.

43. Fire Flow Test shall mean a standard flow test performed as specified in Section 6.5 of these Guidelines and Policies with at least two (2) hydrants to determine static and residual pressures and flow producing capabilities at a specific location within the Commission's water distribution system. The results of such testing shall provide data on how much water is available to fight fires, but may also indicate the general condition of the Commission's distribution system.

44. Fire Service Pipe shall mean the private water piping and associated valves, control valves, and Appurtenances installed solely to furnish water for extinguishing fires that extend from a Water Service connection into a Premise. The Customer owns the Fire Service Pipe.

45. Guidelines and Policies shall mean, but not limited to, these standards for access, design, operation, maintenance, construction, rehabilitation and / or use of the public water and sewer systems used by the Commission.

46. Hydrant shall mean a device connected to a Public Water Main or private water service for the purpose of extinguishing fires or other authorized purpose.

47. Industrial shall mean a classification of Water Users that are primarily engaged in applying skill and labor to giving of new shapes, qualities or new combinations to matter as material products, or to the assembly or processing of manufactured or natural products.

48. Industrial User means an Industry discharging Industrial Wastewater to a Public Sewer.

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49. Industrial Wastewater means the liquid Wastes from industrial manufacturing processes, laboratories, trades or businesses which predominate as distinct from Domestic Wastewaters.

50. Industry shall mean an establishment with facilities for manufacturing, processing, fabricating, finishing, assembly, testing, or packaging goods including materials, chemicals byproducts, and finished and unfinished products. The Industry may be classified as a Wet Industry or Dry Industry.

51. Institutional shall mean a classification of Wastewater User including public or private schools, churches, State or Federal governmental buildings and offices, religious organizations, and similar facilities both profit and nonprofit.

52. Interceptor Sewer means a Sewer, located in public and/or private property, which collects the entire flow from a number of Public and/or Private Sewers, conveys the flow to a suitable collection point for final discharge to a place of Wastewater treatment and is entirely controlled by the municipality.

53. Leak shall mean an escape of water from the Commission's water mains, hydrants, or in the Owner's Water Service Pipe, Fire Service Pipe, or a Combined Service.

54. License Agreement shall mean a form prescribed by the Commission that provides for the construction of Public Water Mains and Public Sewers and other Water and Sewer Facilities and permission for limited use with respect to Commission property, easements, and other Water and Sewer Facilities.

55. Lot means real property, which is described by deed, or filed subdivision plan, as a single entity and cannot be the further subdivided.

56. Main Extension Application shall mean the form provided by the Commission and completed by the Owner or by an Owner's authorized agent and submitted to the Commission prior to construction, reconstruction, repair or modification of a Public Water Main. A completed application includes verification that the Premise address listed therein is correct.

57. Master Meter shall mean the primary water meter used for billing purposes serving a building, group of buildings, or Premises / Property. There may be more than one (1) meter serving a building, group of buildings, or Premises / Property.

58. Material Specifications shall mean the Commission supplied description of materials to be used for construction and rehabilitation of the Public Water and Sewer Systems.

59. MDEP shall mean the Massachusetts Department of Environmental Protection.

60. Meter Pit shall mean an underground vault enclosing a Meter.

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61. Meter shall mean an instrument or device, including any appurtenances thereto, for measuring the flow of water.

62. MGL 40-N means the Chapter 40-N of the Massachusetts General Laws, as amended.

63. Municipal shall mean a classification for Water User and/or Wastewater User facilities that are owned and operated by the City of Springfield and/or the Town of Ludlow solely for the purposes of providing the following municipal services: Administrative; Public Works; Police; Fire and Safety; Educational; Parks and Recreational facilities; Libraries. This does not include Wastewater services provided by the Town of Ludlow.

64. Owner shall mean a Person(s) who alone or jointly or severally with others, has the legal title to any Premises.

65. Parcel means real property consisting of one (1) Lot, or two (2) or more contiguous Lots, under one (1) ownership.

66. Person(s) shall mean any individual, any agency of the federal government, any agency or political subdivision of the Commonwealth, any public or private corporation or authority, any corporation trust, firm, joint stock company, partnership or association, or other entity, or any group thereof, and any officer, employee, or agent of such person, and any group of persons.

67. Plumber shall mean a person with a current and valid license as a plumber by the Commonwealth of Massachusetts.

68. Potable Water shall mean water fit for human consumption in conformance with the regulations of the MDEP.

69. Premise / Property shall mean a parcel of real estate or portion thereof, including any improvements thereon, which are determined by the Commission to be a single user for purposes of receiving, using and paying for Water Service and/or Sewer Service.

70. Private Drain means any Drain located on private property and not under the full care and control of the Commission or the City of Springfield.

71. Private Fire Protection shall mean private water mains, Fire Service Pipes and other appurtenances installed for the purpose of fire protection and suppression at a particular Premise.

72. Private Hydrant shall mean a hydrant installed and maintained by an Owner for the purpose of private fire protection/suppression at a particular Premise.

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73. Private Sewer means any Sewer located on private property that collects and conveys Wastewater from two (2) or more Building Sewers, discharges into a Public Sewer, and is not under the full care and control of the Commission.

74. Private Water Main shall mean a water main that is not owned by the Commission.

75. Public Drain means a Drain located in a public, private way, or easement in which all owners of abutting properties have equal rights and is under the full care and control of the City of Springfield.

76. Public Fire Protection shall mean the Public Water mains, Hydrants, and Appurtenances installed for the purpose of fire protection in a public way, Commission owned Easement, whether recorded or by prescription or private way open to public travel.

77. Public Sewer means any Sewer owned or maintained by the Commission and any Sewer situated outside the City of Springfield that is owned or maintained by a city, town, or district that discharges into Commission's Wastewater Treatment Works.

78. Public Water Main shall mean the piping and associated valves, hydrants and appurtenances owned by the Commission installed in a public way, publicly-owned easements whether recorded or by prescription, or private way open to public travel, for the purpose of supplying water to one or more customers or for public fire protection.

79. Public Water Supply shall mean the water and/or ground water that is provided to the public for human consumption.

80. Public Water System shall mean a system for the provision to the public of piped water for human consumption. The Commission is a Public Water System.

81. Remote Meter Device means an instrument for reading a Water Meter, located at a distance from the meter, generally outside the building being metered.

82. Requirements for Site Plans shall mean the document that describes the information that must be included in site plans submitted to the Commission. A Site Plan is required by the Commission for review and approval by the Executive Director of a proposed connection or reconstruction, repair or modification of a Water Service Pipe or Fire Service Pipe or appurtenance, which connects, to the Commission's water distribution system. The document also includes requirements for connections to the Commission's sanitary and combined sewers systems.

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83. Residential shall mean a classification of Water Users that use or engage in providing housing facilities which include all dwellings, tenements, apartments, trailer houses (single), and other forms of housing.

84. Sanitary Sewer means a Sewer, which carries domestic, and/or Industrial Wastewaters and to which surface runoff from storms and groundwater is not intentionally admitted.

85. Service Application shall mean the form provided by the Commission and completed by the property Owner or by an Owner's agent and submitted to the Commission prior to construction, reconstruction, repair or modification of a Water Service Pipe or a Fire Service Pipe from a Public Water Main. A completed application includes verification that the premise address listed therein is correct.

86. Service Area shall mean the geographic area that is or can be serviced by the Commission's existing water and/or Sewer systems.

87. Sewer means a pipe or conduit for carrying Wastewater.

88. Sewer Facilities include structures, conduits, pumping stations, treatment and disposal works, and other appurtenances for the purpose of collecting, treating and disposal of domestic and/or Industrial Wastewater.

89. Shut Off shall mean to temporarily stop Water Service or to terminate Water Service, in accordance with the Commission's Rules and Regulations.

90. Storm Drain means a pipe or conduit for conveying rainwater, groundwater, subsurface water, condensate, cooling water, or other similar discharge.

91. Surety Required shall mean the bond, letter of credit, or other Commission approved financial guarantee to be posted as surety by an Owner to extend a Public Water Main, Sewer Main, and /or build a water and/or sewer pump station. Bonds Required shall also mean the bond, letter of credit, or other Commission approved financial guarantee to be posted as surety by a Commission Approved Contractor to work on the Commission's Water Distribution System or Sewer Collection System for an approval period.

92. Tapping Main Charge (Basic) shall mean the cost charged for connecting to existing water mains for new mains, main extensions, and service connections. The Commission shall provide labor and equipment to tap the existing main. The following items are not included in this charge and are provided by the Applicant: permits, paving, location work, excavation, backfill, and compaction, police, traffic control, tapping sleeve, tapping valve, pipe installation, appurtenances, flowable fill, rock excavation, frost excavation, concrete removal, and hauling in suitable fill. This charge shall be paid when application is submitted.

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93. Tapping Main Charge (Complete) shall mean the cost charged for connecting to existing water mains for new mains, main extensions, and service connections. The Commission provides excavation, materials, installation, and backfill. The following items are not included in this charge: permits, paving, flowable fill, rock excavation, frost excavation, pipe installation, police, traffic control, concrete removal, and hauling in suitable fill. This charge shall be paid when application is submitted.

94. Turn-On shall mean initiate or restore Water Service in accordance with the Commission's Rules and Regulations. No Turn-on will occur for any account with an overdue balance.

95. Undeveloped Property means property that is void of any buildings, does not have Wastewater facilities, and does not require a connection to the Public Sewer.

96. User shall mean a Person who receives water and/or Sewer service(s) from the Commission within the Commission's Service Area.

97. Wastes mean substances in liquid, solid or gaseous form that can be carried in water.

98. Wastewater means the spent water of the municipality and may be a combination of the liquid and liquid borne wastes from residences, Commercial buildings, industrial plants, and institutions, together with any groundwater and surface water that may be present.

99. Wastewater Works or Wastewater Treatment Works means any arrangement of devices and all structures, equipment and processes for collecting, pumping, treating and disposing of Wastewater and associated residuals.

100. Water / Sewer Pipe Inspection shall mean the cost charged to inspect the layout, installation, repair, water quality test, retest or re-inspection of a scheduled Backflow Prevention Device of a Commission Water Facility, Public Sewer, Public Drain, Sewer, or Drain on a per day or per inspection basis. This charge shall be paid as a deposit when application is submitted based on an estimated number of days and/or inspections required in accordance with Section 3.10.1 of these Rules and Regulations. A final invoice shall be sent to the Customer that includes the actual number of days.

101. Water and Sewer Service shall include but not be limited to water, sewer and other services, facilities and commodities furnished or supplied by the Commission pursuant to MGL 40-N.

102. Water Facilities will mean Meters, Backflow Prevention Devices, water valves, water mains, Water Service Pipes, Fire Service Pipes, and water hydrants.

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103. Water Meter means any device for measuring and recording the water consumption at a building or property, installed by or at the order of the Commission, which may be used for billing by the Commission.

104. Water Service Connection shall mean the connection and the associated valves and appurtenances at the water main for the purpose of turning Water Service on and off for the purpose of supplying water and for fire protection and suppression. The Commission owns the Water Service Connection.

105. Water Service Pipe shall mean the piping and associated valves and appurtenances that extend from a Water Service Connection to the Commission's Meter for the purpose of supplying water, other than for fire protection and suppression. The Customer owns the Water Service Pipe. A new Water Service Pipe is installed by a Commission Approved Contractor. A replacement Water Service Pipe is installed by the Commission.

106. Water Service shall mean the readiness to supply or actual supplying of water to Premises in which a Water Service Pipe or Fire Service Pipe has been installed.

107. Water Users or Water Consumers shall mean all public and private users of the Commission's water system, irrespective of any person's responsibility for billing purposes for water used at any particular facility.

108. Watershed lands, Reservoir lands, Roads and Trails, and Waterways shall include boulevards, roadways, driveways, trails, bridges, buildings, structures, land, beaches, ponds, lakes, rivers and other waters under the care and control of the Springfield Water and Sewer Commission.

109. Well shall mean any dug, driven or drilled hole, with a depth greater than its largest surface diameter, developed to supply water intended and/or used for human consumption, irrigation, or industry and not subject to regulation by 310 CMR 22.00.

110. Wet Industry means a classification of Users which includes all industries which produce large volumes of Wastewater; or which produces a Wastewater of greater strength than residential Wastewater (or contains constituents which require pretreatment in accordance with Chapter 1) shall be classified as Wet Industry for purposes of this chapter.

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CHAPTER 4 APPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS

Section 4.1 Applications

4.1.1 General

1. An application is required for, but not limited to, the following:

   (a) Water Service

   (b) Water Main Extension

   (c) Sewer Service

   (d) Sewer Main Extension

   (e) Commission Approved Contractor

   (f) Cross Commission Transmission Mains, Easements, or Property

   (g) Fire Flow Test

2. All applications except Application to Cross Commission Transmission Mains, Easements, or Property, can be made at the Commission's Customer Field Service office at 71 Colton Street, Springfield, MA. Applications to Cross Commission Transmission Mains, Easements, or Property can be made at the Commission's Engineering and Technical Services office at 250-M Street Extension, Agawam, MA 01001.

   (a) Fill out an application form(s) according to Section 4.1 of these Guidelines and Policies;

   (b) Pay application fees as set forth in the Commission's Schedule of Rates Fees and Charges in its Rules and Regulations;

   (c) Submit Proposed Site Plan(s) according to Section 4.2 of these Guidelines and Policies;

   (d) Submit information on Fire Suppression System Plan according to Section 4.2 of these Guidelines and Policies;

   (e) Submit information on Backflow Prevention Devices according to Section 4.2 of these Guidelines and Policies and;

(f) Submit information on Grease Interceptors for FOG control, according to Section 4.2 of these Guidelines and Policies.

(g) Application procedures, submittals and all other requirements to Cross Commission Transmission Mains, Easements, or Property shall be in accordance with 15.1.9 of these Guidelines and Policies.

3. An Applicant shall be the Owner or the Owner's authorized representative. The Owner's authorized representative shall have a letter signed by the Owner of the property to be serviced authorizing the Owner's authorized representative to apply for service. The letter shall include the Owner's name, billable address, and phone number.

4. An Application fee is required at the time of application and at rates as set forth in the Commission's Schedule of Rates Fees and Charges in its Rules and Regulations. The fee includes the cost of the site plan review.

5. Typically, one (1) service application is required for each billing account and may include both water service and sewer connections with the appropriate Application Fees and Plan Submittals.

4.1.2 Application Procedure for Residential Water/Sewer Service Pipe:

1. An Applicant shall submit a separate Residential Water/Sewer Service Application for each water service pipe requested entering a Property. A Building Sewer Connection for the same Property may be included on the Application.

2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.

4.1.3 Application Procedure for Commercial/Industrial Water Service Pipe or Fire Service Pipe:

1. An Applicant shall submit a Water Service Application for the water service pipe(s) requested entering a Property.

   (a) A Fire Service Pipe Application for the same Property may be included on the Application.

   (b) A Building Sewer Connection Application for the same Property may be included on the Application.

2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.

3. If applicable, an Applicant shall submit fire suppression system plans for review. See Section 4.2 for plan submittals.

4. If applicable, an Applicant shall submit backflow prevention plans for review. See Section 4.2 for plan submittals.

4.1.4 Application Procedure for Residential Building Sewer Connection:

1. An Applicant shall submit a separate Building Sewer Connection Application for each building sewer connection requested. A Water Service Pipe for the same Property may be included on the Application.

2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.

4.1.5 Application Procedure for Non-Residential Building Sewer Connection:

1. An Applicant shall submit a separate Building Sewer Connection Application for each building sewer connection requested. A Water Service Pipe for the same Property may be included on the Application.

2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.

3. An Applicant shall submit a Proposed Plumbing Plan for review. See Section 4.2 for plan submittals.

4. An Applicant shall submit a Proposed Fats, Oils, and Grease (FOG) design, sizing and construction plan for review. See Section 4.2 for plan submittals.

5. An Applicant shall submit an FOG Maintenance Plan for review. See Section 4.2 for plan submittals.

4.1.6 Application Procedure for New Water Main, Water Main Extension, or Replacement:

1. An Applicant shall submit a separate Water Main Extension Application for each new water main, water main extension, and/or water main replacement requested.

2. An Applicant shall submit a separate Water and Sewer Application for each type of service requested in addition to the Water Main Extension Application. See the above Water Service and Building Connection Applications.

3. An Applicant shall submit a Proposed Site Plan when applying for a New Water Main, Water Main Extension, or Replacement. See Section 4.2 for plan submittals.

4. The Applicant shall also submit the Proposed Site Plan to the local Department of Publics Works and local Fire Department that have jurisdiction.

5. The Applicant may also be required submit the Proposed Site Plan to the local Planning Department, local Fire Department, and/or local Conservation Commission that have jurisdiction as determined by the Commission.

6. The Applicant shall submit the block plan or Assessor's Plan. See Section 4.2 for plan submittals.

7. The New Water Main Installation/Extension Charge at rates as set forth in the Commission's Rules and Regulations.

4.1.7 Application Procedure for Subdivisions

1. Subdivisions require a single application for the water main and sewer main extension.

2. Each house requires a single application for both the water service and sewer connection.

4.1.8 Application Procedure for Commission Approved Contractor

1. The Installer is required to have completed the approval process to perform work on projects relating to the Commission's Public Water Mains and/or Public Sewers.

2. This policy will evaluate Installers to determine if the Installer has the qualifications and experience to perform work on projects relating to the Commission's Public Water Mains and/or Public Sewers.

3. The scope of work for projects relating to the Commission's Public Water Mains and/or Public Sewers is limited to small to medium sized projects. Examples of this work are:

   (a) Water mains — installation, repair

   (b) Hydrants — installation, repair

   (c) Valves and other appurtenances — installation, repair

   (d) Bypass piping – installation, maintain

   (e) Services — new installations, replacements, and cut offs

   (f) Sewer Mains – installation, repair, cleaning, jetting

(g) Manholes – installation, repair, rehabilitation

(h) Repairs to sewer service

(i) Video inspection and analysis of sewer mains

(j) Excavation, backfilling, compaction, and/or surface restoration

4. Installers shall provide Required Bonding, as set forth in the Commission's Rules and Regulations, at the time of application.

5. At the time of Application Installers shall provide proof of Required Insurance as defined below:

   (a) Workmen's Compensation, Employer's Liability Insurance, and Occupational Disease Insurance: The INSTALLER shall, before commencing the Work, provide by insurance for the payment of compensation and the furnishing of other benefits under MGL Chapter 152 (Ter. Ed.) to all persons employed under the contract and the INSTALLER shall continue such insurance in force and effect during the term thereof.

   (b) Comprehensive General Liability Insurance: The INSTALLER shall, before commencing the Work, carry Public Liability Insurance and Property Damage Insurance, including coverage for contractual liability, and (if sub-contractors are involved) INSTALLER's Protection Liability Insurance, satisfactory to the COMMISSION so as to save the COMMISSION harmless from any and all claims for damages arising out of bodily injury to, accidental death, or destruction of property caused by accident resulting from the use of implements, equipment, or labor used in the performance of the contract or from any neglect, default, or omission or want of proper care, or misconduct on the part of the INSTALLER or anyone in the INSTALLER's employ during the execution of the Work.

   (c) Limits in the amounts of not less than $250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than $100,000.00 for property damage insurance.

   (d) When any motor vehicles are used in connection with the Work to be performed, Automobile Public Liability Insurance with limits of not less than $250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than $100,000.00 for property damage insurance.

6. The approval period will be 3 years.

7. The method of approval is as follows:

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(a) The Installer must complete the Commission Approved Contractor Application Form, attached in Section 15.1.1, sign and date the Safety Assurance Form, attached in Section 15.1.2, and sign and date the Indemnity Form, attached in Section 15.1.3 of these Guidelines and Policies. The completed application must be submitted to the Commission at the Commission's Customer Field Service Office at 71 Colton Street, Springfield, MA.

(b) The Installer shall have at least one (1) responsible supervisor with a cellular phone number for immediate contact at any job site.

(c) The Installer's history shall indicate the Installer's company has been in business a minimum of five (5) years installing and repairing Public Water Systems and/or Public Sewer.

(d) The Installer's procedure and equipment for pressure testing water and sewer mains shall indicate the Installer's company has the proper equipment and method of work to successfully pressure test said mains in projects work as defined in Paragraph 3 above.

- Hiring of a subcontractor to perform the pressure test is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted.

(e) The Installer's procedure and equipment for disinfecting water mains and services shall indicate the Installer's company has the proper equipment and methods to successfully disinfect and put into service the water mains and services.

- Hiring of a subcontractor to perform the disinfection procedure is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted.

(f) Any person licensed by the Commonwealth of Massachusetts as a Master or Journeyman Plumber shall be deemed qualified to make connections to sewers, but still must obtain a Commission Approved Contractor Card for such activities.

(g) Any person licensed by the Commonwealth of Massachusetts as a Drinking Water Operator – Distribution 2 or higher shall be deemed qualified to install or repair water mains, water services, and/or other water appurtenances, but still must obtain a Commission Approved Contractor Card for such activities.

(h) Provide proof of the Required Bonding as defined on the Application Form, attached in Section 15.1.1 of these Guidelines and Policies.

(i) Provide proof of Required Insurance as defined in Paragraph 5 above.

(j) The Installer shall provide references, on request, which shall list a minimum of five (5) Municipal projects that the Installer performed on water and/or sewer work, in the last five (5) years. The listing is to include:

- Name of Municipal project
- Description of services provided
- Date the work was performed and date the work was completed
- Point of contact with address and a desk top phone number whom the Commission has authorization to contact regarding the project

8. The Commission shall evaluate all Application Forms submitted by the Installer, interview the Installer, and make a recommendation to the Executive Director for approval or denial.

9. Installers, who have their request denied, may appeal the decision, in writing to the Executive Director of the Commission.

4.1.9 Application and Scheduling Procedure for Fire Flow Testing

1. An Applicant shall submit a separate Fire Flow Test Application, Fee, and Deposit for each Fire Flow Test requested in accordance with the Commission's Rules and Regulations.

2. The Applicant is be required to submit a plan or Commission distribution map showing the hydrants to be used during the Fire Flow Testing.

3. The Commission shall schedule to have all valves in the Fire Flow Test area operated to ensure the valves are in the open position. The valves will be operated within 14-days of the Applicant submitting the Application, Fee, and Deposit.

4. The Applicant shall schedule a day, after the valve(s) position have been operated, to perform the Fire Flow Test through Customer Service or if unable to schedule at time of application call the Commission's Inspection office at 413-787-6069. Weather conditions may require the Fire Flow Test(s) to be rescheduled. No Fire Flow Test(s) shall be scheduled when temperatures are below freezing, unless special arrangements are approved by E&TS.

5. The Applicant shall demonstrate experience in the art of performing Fire Flow Tests and shall demonstrate the experience to the satisfaction of the Commission.

6. Fire Flow Testing shall be performed in accordance with Section 6.5 of these Guidelines and Policies.

Section 4.2 Submittals, As-Built Plans, Record Sketches, and Service Cards

4.2.1 General

1. The Applicant for any new water and/or sewer service must submit a Proposed Site Plan(s) Backflow Prevention Plan(s), Fire Suppression Plan(s), Plumbing Plan(s) and/or Fats Oils and Grease Interceptor Plan(s) for review, comments, and potential approval by the Commission.
2. The Commission reviews Proposed Site Plan(s) and other plan(s), as appropriate to determine compliance with Commission Rules and Regulations, the Guidelines and Policies, and the Commission's Material Specifications.
3. The Applicant's engineer may contact the Commission for copies of records of existing water and sewer mains and services.
4. The Commission needs one (1) Proposed Site Plan for draft review and comment and after the draft is approved, five (5) Final Site Plans shall be submitted.
5. A License Agreement(s), according to the Commission's Rules and Regulations and Section 4.3.2 of these Guidelines and Policies, for all Water and Sewer Main Extensions shall be submitted after the Final Site Plan has been approved and before construction can begin. The License Agreement Form is attached in Section 15.1.4 of these Guidelines and Policies.
6. Surety Required, according to the Commission's Rules and Regulations, in a form approved by the Commission for all Water and Sewer Main Extensions, shall be submitted after the Final Site Plan has been approved and before construction can begin.
7. The Commission, at its discretion, may require additional design requirements based on site conditions, capacity issues, existing infrastructure materials, and/or other unknown conditions.

4.2.2 Proposed Site Plans

1. Proposed Site Plans for New Water Main Extensions and New Sewer Main Extensions shall include the following;

   (a) A narrative letter briefly describing the proposed project, type of establishment and anticipated average daily and peak water demand and sewer discharge is required;

(b) at a minimum may be submitted on 24-inches X 36-inches;

(c) MA Professional Engineer stamp;

(d) a Title Block that includes Street Name, sewer or water main extension, extents of extension, such cross street to cross street, date for submittal and latest revision, vertical datum and horizontal datum (if applicable), and scale of plan;

(e) a Block Plan or Geographical Information System (GIS) map from the City of Springfield Department of Public Works-Engineering or an Assessor's Plan from the Town of Ludlow Assessor's office at Town Hall showing the lot and/or parcel to be serviced and an intersecting street may also be required;

(f) new water and/or sewer main and/or service locations and existing water and/or sewer main and/or service locations, shall be shown on the Proposed Site Plan;

(g) existing and proposed water and/or sewer main structures, fittings and appurtenances to be connected;

(h) existing and proposed lots or parcels, right of way layout, labels of lots, and any existing street addresses of the project site;

(i) existing and proposed utilities particularly underground for the project area;

(j) proposed easements through which water and or sewer services are proposed;

(k) widths of proposed easements are to be determined by the Commission and;

2. There are several options for overall project sanitary service. In addition to Paragraph 1 above, the Proposed Site Plans for **Sewer Main Extensions** shall also include the following, in order of preference by the Commission;

(a) Gravity sanitary flows to other existing gravity sewers.

(b) Gravity flows to an existing sanitary pump station. Capacity availability at the pump station and in existing sanitary mains must be determined based upon proposed peak design flows for this project and other potential building lots outside of this project area but served by proposed sewers.

(c) In some cases an existing sanitary pump station is in the area. If available capacity of an existing sanitary Pump Station, force main, or gravity sewers is not adequate to serve the proposed project, the developer must fund the analysis, design, and construction of Commission infrastructure upgrades such that there is adequate capacity. The Commission would participate in the analysis of existing capacity of structures.

(d) Design and construction of new private pumping facilities for project flows to existing public gravity sewers. The Commission currently has a moratorium on new public pump stations. Any proposed new pump station must be approved by the Commission Executive Director.

(e) Engineers will explore each alternative in order before proposing new private sanitary pump stations.

3. Proposed Site Plans for **Subdivisions** shall include the following;

4. Comply with the Water Main Extensions and Sewer Main Extensions requirements in Paragraphs 1 and 2, above;

(a) if the subdivision is to be built in phases then the phases shall be defined so that proper appurtenances for water and sewer can be installed at the end of each phase, so that the next phase can be started without adverse effect on existing customers;

(b) any local Planning Board requirements must also be met by the Applicant's engineer, including, but not limited to, Preliminary Plan submission as defined by the State of Massachusetts and Definitive Plan submission as defined by the State of Massachusetts;

(c) any local Fire Department requirements must also be met by the Applicant's engineer;

(d) any local Department of Publics Works requirements must also be met by the Applicant's engineer;

(e) A coordination meeting(s) may be required to achieve this.

5. Proposed Site Plans for **Residential Water and Sewer Service** shall include the following;

(a) At a minimum may be submitted on 8.5-inches X 11-inches;

(b) a mortgage survey is acceptable for a Residential Proposed Site Plan;

(c) a Title Block that includes Service address, type of service(s) the plan is for, date for submittal and latest revision, vertical datum and horizontal datum (if applicable), and scale of plan;

(d) a Block Plan or Geographical Information System (GIS) map from the City of Springfield Department of Public Works-Engineering or an Assessor's Plan from the Town of Ludlow Assessor's office at Town Hall showing the lot and/or parcel to be serviced and an intersecting street may also be required;

(e) a street address and a lot or parcel number must be obtained from the Department of Public Works, that has jurisdiction;

(f) the proposed building(s) footprint;

(g) new water and/or sewer service locations, existing water and/or sewer service locations, and any water and/or sewer service locations to be discontinued and;

(h) may require MA Professional Engineer's stamp for unusual layouts and/or easements though adjacent properties of other Owners.

6. Proposed Site Plans for Commercial/Industrial and Multi-family Residential (3-family or more) Water and Sewer Service shall include the following;

(a) A narrative letter briefly describing the proposed project, type of establishment and anticipated average daily and peak water demand and sewer discharge is required;

(b) at a minimum may be submitted on 24-inches X 36-inches;

(c) MA Professional Engineer stamp;

(d) a Title Block that includes Service address, type of service(s) the plan is for, date for submittal and latest revision, vertical datum and horizontal datum (if applicable), and scale of plan;

(e) a Block Plan or Geographical Information System (GIS) map from the City of Springfield Department of Public Works-Engineering or an Assessor's Plan from the Town of Ludlow Assessor's office at Town Hall showing the lot and/or parcel to be serviced and an intersecting street may also be required;

(f) a street address and a lot or parcel number must be obtained from the Department of Public Works, that has jurisdiction;

(g) the proposed building(s) footprint;

(h) new water and/or sewer service locations, existing water and/or sewer service locations, and any water and/or sewer service locations to be discontinued;

(i) existing and proposed water and/or sewer main structures, fittings and appurtenances within the site and within any right of way which contains mains serving the project site;

(j) existing and proposed lots or parcels, right of way layout, labels of lots, and any existing street addresses of the project site;

(k) existing and proposed utilities particularly underground for the project area;

(l) proposed easements through which water and or sewer services are proposed and;

(m) widths of proposed easements are to be determined by the Commission.

7. When applicable, a Demolition Plan showing the Discontinuance of Existing water and sewer services will also be submitted at this time. Discontinuance submittals include the following:

   (a) Location of service to be discontinued;

   (b) Method that the Installer or Owner will be used to discontinue the service.

8. When applicable, a plan showing any Cross Connection will also be submitted at this time. Any Cross Connection must be separated from the public water supply by a Backflow Prevention Device (BFP) for certain water uses according to CHAPTER 10 of these Guidelines and Policies.

9. **Backflow Prevention Device** submittals include the following:

   (a) Plumbing plan showing location of backflow prevention device (BFP) according to Section 10.1, Paragraph 6 of these Guidelines and Policies;

   (b) the type of BFP to be installed and;

   (c) the specifications of BFP to be installed.

10. When applicable, a plan showing a Fire Suppression System will also be submitted at this time. All fire suppression systems are a Cross Connection and must be separated from the public water supply by a Backflow Prevention Device (BFP) for certain water uses according to CHAPTER 10 of these Guidelines and Policies.

11. **Fire Suppression System** submittals include the following;

    (a) Comply with the BFP requirements in Paragraph 9, above;

(b) The fire suppression system design is the responsibility of the Applicant's engineer;

(c) a proposed site plan and plumbing plans of fire suppression system which is separate from the domestic water system to the public water main;

(d) Fire Flow Testing may be required - Fire Flow Test results only represent the conditions of the public water system at the time of the test. Public water system functioning may vary from day to day and hour to hour within the parameters of DEP requirements. The Commission does not review or approve fire suppression systems for adequacy of flow or pressure;

(e) all public and private hydrants existing and proposed;

(f) the location of the External Fire Department Connections (FDC) (typically the FDC must be located within 100 feet of a public hydrant) on the exterior of building

(g) any Fire Department requirements must also be met by the Applicant's engineer and;

(h) a coordination meeting(s) may be required to achieve this.

12. When applicable a plan showing any internal and/or external Fats, Oils, and Grease (FOG) Interceptor will also be submitted at this time according to the Commission's Rules and Regulations.

13. **Fats, Oils, and Grease Interceptor** submittals include the following:

    (a) Grease interceptor equipment design and sizing and construction details.

    (b) Plumbing plan and/or site plan showing location of installation.

    (c) FOG Maintenance Plan.

14. **Industrial Pretreatment Sanitary Survey** – Certain industries require pretreatment of sanitary flows before being discharged to the public sewer system. Contact the Commission's Industrial Pretreatment Program for specific requirements at 787-6207 x 213.

4.2.3 Minimum Design Standards

1. New Water Mains and Appurtenances shall be shown and designed on Proposed Site Plan(s) according to CHAPTER 6 of these Guidelines and Policies and these minimum design standards as follows;

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(a) The Commission reserves the right to change any of the below requirements at its discretion during the review process.

(b) When horizontal or vertical control is required the Massachusetts State Plane Coordinate System in feet using the North American Datum 1983 (NAD83) (NAD83 is a horizontal datum) shall be utilized, unless otherwise approved by the Commission. Vertical Datum should be provided in New City of Springfield Base which may be converted in accordance with Relation of Vertical Datums to Springfield City Base Detail (W-15.0), unless otherwise approved by the Commission. Please note that the Relation of Vertical Datums to Springfield City Base Detail (W-15.0) provided is a reference and a guide. If vertical control is critical to a project than a survey by a professional surveyor is required.

(c) The minimum pressure in all new public water mains shall be twenty (20) pounds per square inch (PSI) under any and all flow conditions including peak hourly flow and maximum day demand with a fire.

(d) The minimum required fire flow from all new public hydrants shall be as follows:

- Residential zoned areas shall be designed to provide 500 gallons per minute (GPM) or as required by the local Fire Department having jurisdiction, whichever is greater, or
- Commercial, Industrial, or Municipal areas shall be designed to provide 1500 gallons per minute (GPM) or as required by the local Fire Department having jurisdiction, whichever is greater, and
- A signed letter from the local Fire Department having jurisdiction stating that the minimum required fire flow requirements have been met is required before an application can be processed.

(e) Water mains shall be a minimum of 8-inch diameter, ductile iron, thickness class 52, and cement lined. Pipes with 6-inch diameter may be allowed with the Commission's approval.

(f) Water mains shall be designed to loop or have dual connections to the Commission's existing distribution system. When this cannot be achieved water mains shall be installed in accordance with the next paragraph.

(g) Water mains in a cul-de-sacs or dead ends that cannot be extended or looped may be 6-inch diameter with Commission approval and the following conditions are met;

- Up to six (6) homes may be provided water services, unless otherwise approved by the Commission.
- Hydrants shall be placed according to paragraph (k) of this Section and shall have one (1) length of pipe placed after the hydrant tee, unless otherwise approved by the Commission.
- The majority of the water services shall be connected after the last hydrant on one length of pipe.

(h) The water mains will be installed on the north or east side of the street.

(i) Typically, water mains in streets shall be located at least 7-feet from sewer mains and water services shall be located at least 10-feet from sewer services and 4-feet from other utilities, unless otherwise approved by the Commission.

- On 40-foot wide streets the pipe will be located 13-feet from the appropriate street line.
- On 50-foot wide streets the pipe will be located 18-feet from the appropriate street line.
- On 60-foot wide streets the pipe will be located 23-feet from the appropriate street line.
- On street widths not defined above the Applicant's engineer shall contact the Commission's Engineering and Technical Services group to determine the location of the water main.

(j) Valves:

- Three (3) Isolation valves shall be installed on each side of three-way intersections at each street line.
- Four (4) Isolation valves shall be installed on each side of four-way intersections at each street line.
- Isolation valves shall be installed every 500-feet on straight runs of water main.
- Isolation valves shall be the same size as the water main being installed.
- Isolation valves shall be gate valves up 12-inch in diameter. Isolation valves 16-inch may be butterfly valves but require Commission approval prior to installation. Isolation valves larger than 16-inch shall be approved by the Commission prior to installation.

(k) Public Hydrants:

- Public Hydrants shall be located approximately every 300-feet to 400-feet, on the same side of the street as the water main, on a property line, and as approved by the local Fire Department.
- Public Hydrants are not to be placed at the end of the main in a cul-de-sac, but rather at or before the point of curvature (PC).
- Public Hydrants are connected directly to public water mains.
- Public water mains are only found in street right of ways or easements given to the Commission by the property owner.
- Public Hydrants used to supply water to private fire protection systems shall be in street right of ways or easements given to the Commission by the property owner.
- The Applicant's engineer must provide information to the Commission and local Fire Department with flow and demand requirements and available flow.

(l) Private Hydrants:

- Private Hydrants within a site shall be installed so as to protect the public water supply per DEP requirements, Commission requirements and the local Fire Department requirements.
- The Applicant's engineer will contact the Commission's Engineering and Technical Services for each such installation.
- Private Hydrants shall not be connected to the Public Water main.
- Private Hydrants shall be installed after a meter and/or back flow preventer.
- Private Hydrants shall conform to the Commission's Material Specification except they shall NOT be provided with a pumper connection.
- Private Hydrants are owned, operated, and maintained by the property owner. It is encouraged to work with the local Fire Department having jurisdiction for any private hydrants to be part of the hydrant certification process, if applicable.

(m) Private Yard Hydrants

- Private Yard Hydrants within a site shall be installed so as to protect the public water supply per DEP requirements, Commission requirements and the local Fire Department requirements.
- The Applicant's engineer will contact the Commission's Engineering and Technical Services for each such installation.
- Private Yard Hydrants shall not be connected to the Public Water main.

- Private Yard Hydrants shall be installed after a meter in accordance with the **Typical Yard Hydrant Detail (W-11.5)**.
- Private yard Hydrants shall have a back flow preventer installed on the threaded outlet or as required by the Commission.
- Private Yard Hydrants shall conform to the Commission's Material Specification except they shall NOT be provided with a pumper connection.
- Private Yard Hydrants are owned, operated, and maintained by the property owner. The Owner is encouraged to work with the local Fire Department having jurisdiction for any private hydrants to be part of the hydrant certification process, if applicable.

(n) Fittings:

- All fittings shall be mechanically restrained, unless otherwise approved by the Commission.

(o) 1-inch through 2-inch Water Service, new replacement and/or seasonal:

- All material shall be in accordance with the Commission's Material Specifications and installed in accordance with these Guidelines and Policies, unless otherwise approved by the Commission.
- Typically, Ball Type Corporation Stops (corporation) shall be installed horizontally at the water main for connecting all services to the new mains. A Ball Type Curb Stop (curb stop) shall be installed at the property line for connecting copper tube from the main to copper tube from the building. A Straight or Angle Ball Meter Valves (meter valve) shall be installed at the building for connecting copper tube from the curb stop to the building. Finally, copper tubing shall be used to make connections between new corporations, new curb stops, and new meter valves.

(p) 4-inch through 12-inch Water Service:

- All material shall be in accordance with the Commission's Material Specifications and installed in accordance with these Guidelines and Policies, unless otherwise approved by the Commission.
- All shut-off valves at the water main shall be 6-inch or larger. If a 4-inch ductile iron water service is required, the Installer shall provide a 6-inch connection and 6-inch shut-off valve and then reduce to 4-inch.
- A stainless steel (SS) or ductile iron (DI) tapping sleeve, or a mechanical joint (MJ) tee is required on the main in front of the property to be served, unless otherwise approved by E&TS.

- A 6-inch or larger tapping by MJ or MJ by MJ gate valve is required, unless otherwise approved by E&TS.
- Any Water Service or Fire Service Pipe that is looped to the Commission's Public Water Main(s) requires check valves at each meter and/or back flow preventer.
- All tees, bends, crosses, and other fittings shall be ductile iron mechanical joint unless otherwise approved by the Commission. If a reducer is required it shall be DI MJ by MJ.
- All pipe shall be DI, thickness class 52, cement lined, and push-on joints. The final 20-feet shall be fully restrained from the flange (F) connection(s) for the outside, spindle and yoke (OS&Y) gate valve(s).
- A companion flange(s) shall be temporarily bolted onto the flanged OS&Y gate valve(s). The companion flange(s) shall have a 2-inch threaded outlet. The threaded outlet shall be utilized for flushing, leak testing, and disinfection.
- When the water service pipe through the wall or floor is to be utilized for a fire service pipe only an OS&Y gate valve in accordance with the Commission's Material Specifications is required as a building control valve. A temporary companion flange with a 2-inch threaded outlet and 2-inch ball valve may be installed on the building control valve for leak testing, flushing and bacteria testing..
- Fire Services may install either OS&Y gate valves or butterfly valves on both sides of the backflow preventer assemblies. Flanged or grooved connections are allowed. The building control valve does not take the place of the assembly valves.
- All joints outside/underground shall be MJ or push-on.
- All joints inside/above grade shall be flanged.

(q) Special Conditions and Requirements:

- New or replacement water mains and/or water services installed within 200-feet of a Fuel Storage Tank and/or if a potable water line is to traverse an area saturated with low molecular weight petroleum products shall be installed with fluorocarbon gaskets, in accordance with the Commission's Material Specifications, for 100-feet on each side of the fuel storage tank or as required by the Commission.

2. Sewer Mains and Appurtenances shall be shown on Proposed Site Plan(s) according to CHAPTER 11 of these Guidelines and Policies and the minimum standards as follows;

(a) The Commission reserves the right to change any of the below requirements at its discretion during the review process.

(b) Sewer mains shall be a minimum of 8-inch diameter, PVC SDR 35, or RCP, or Ductile Iron thickness class 52, epoxy lined.

(c) Sewer mains shall be installed in the center of the street.

(d) Sewer mains shall be a minimum of 4-feet deep.

(e) 8-inch Sewer mains shall be sloped at 0.4% (4.8-inch/100-feet).

(f) Manholes shall be at no more than 300-feet apart and at all changes in diameter, material, slope, and direction.

3. All installations of utilities adjacent to Commission water and sewer mains must be a minimum of 4-feet from the existing water and/or sewer main, edge to edge of pipe. Adjacent utilities may include but not be limited to underground conduits for cable, electric, fiber optic, gas, and telephone.

4.2.4 As-Built Plans

1. An As-Built plan of all water and sewer mains and any other appurtenances, which have been constructed as part of the main extension construction shall be provided to the Commission. It is recommended that the engineer of record submit an initial paper draft for Commission review before submitting a mylar.

2. As-Built plans shall be submitted 60-days after the water and/or sewer main has been put into service.

3. For each new or relocated utility installed, including those installed or relocated by others during the main extension, the engineer of record shall perform an as-built location survey by coordinates prior to backfilling the excavation.

    - The survey data shall be obtained by Global Positioning Survey (GPS) and certified by a Professional Land Surveyor registered in Massachusetts.

4. The following information shall be included on any As-Built Plan of water and sewer main extensions and/or Subdivisions to be submitted to the Springfield Water and Sewer Commission.

    (a) At a minimum, the description and location of sanitary structures includes size, material, and slope of mains, rim elevation, invert elevation of manholes, cleanouts, chimneys, and building sewer connections.

    (b) At a minimum, the description and location of water structures must include size, material, of all mains, hydrants, fittings, bends, and water services.

(c) Any other information required for a full description of the infrastructure to be turned over to the Commission shall be included. The location and description of all other utilities, which have been constructed within the new or existing right of way will be included as practicable.

(d) The location and description of all easements, which are pre-existing and were created as part of the main extensions or the subdivision process, within the project area, shall be included.

(e) A full description of the layout of the newly established or existing street right of way and/or easements to be deeded to the Commission shall include the location, metes and bounds description of all monumentation.

(f) The lots, which have been established, and are pre-existing, within the project area shall be labeled with lot numbers and street addresses as appropriate.

5. The plan shall be stamped and signed by the main extension's design engineer, who shall be a Professional Engineer in the Commonwealth of Massachusetts, certifying that the information shown on the plan reflects a field investigation of the water and sewer mains and appurtenances which were constructed.

6. The quality of the plan and its material must be such that it can be recorded in the Hampden County Registry of Deeds. This includes but is not limited to a plan on mylar with original Professional Engineer's stamp and signature.

7. A complete digital base plan shall be provided in AutoCAD DWG format Release 2000i or later on a Compact Disk (CD), properly referenced to the Massachusetts State Plane Coordinate System in feet using the North American Datum 1983 (NAD83) (NAD83 is a horizontal datum) unless otherwise approved by the Commission. Vertical Datum should be provided in New City of Springfield Base which may be converted in accordance with **Relation of Vertical Datums to Springfield City Base Detail (W-15.0).**, unless otherwise approved by the Commission. Please note that the **Relation of Vertical Datums to Springfield City Base Detail (W-15.0)** provided is a reference and a guide. If vertical control is critical to a project than a survey by a professional surveyor is required. The following standards shall be applicable:

   (a) All text shall be drawn using a STYLE of "L100-XX" (where XX refers to the plotted scale) and a font file of "SIMPLEX" as provided in the AutoCAD. The style shall be defined as a "fixed height" style and have a height of 0.10 times the drawing plotted scale. (i.e. 4.0 for 40 scale plan, 2.0 for 20 scale etc.).

   (b) Precision and Accuracy shall be as indicated below:

   - Horizontal survey:

- Precision: Horizontal control and surveyed points shall maintain a minimum precision of 1:10,000.
- Accuracy: No more than 10% of the survey points shall be in error by more than 1/100 inch or 0.25 mm when viewed at the requested scale.
- Vertical survey:
- Precision: Vertical Control shall have a maximum error of closure no greater than .075 feet or .02 meters.
- Accuracy: No more than 10% of elevations when interpolated from a Surface shall be in error of more than 1/2 a contour interval.
- Surface Data:
- The data format shall conform to Autodesk Land Development Desktop Project files. If the Contractor uses a different software product to create a surface, then the surface must be represented as a TIN (Triangulated Irregular Network) of 3D lines on a separate, distinct layer within the AutoCAD drawing file. 3D faces or 2 dimensional lines are NOT acceptable.

4.2.5 Record Sketches

1. Record Sketches by Commission Inspectors shall be in accordance with the **Record Sketch Detail (W-16.0)** and include the following information:

   (a) Street name, City or Town, limits of sketch, and page number starting in upper right hand corner.

   - Identify which water main, if more than one main in street, by size and/or which side of street (N, S, E, or W).
   - Identify "Easement" in street name when water main is installed in an easement.

   (b) Pipe diameter, material, pressure class or pipe class, lining, manufacturer, section length, joint type, installed by, and install date at top of page

   (c) The sketch should show a North arrow, street lines, all fittings, valves, hydrants, air corps and air valve assemblies, and 4-inch and larger water services with distances in feet and inches from center of each component. A distance from street line to center of pipe should be shown. Dates and by whom of any cut-in or tapped components should be shown.

   (d) Totals of each main extension installation should be tabulated at bottom of page.

   (e) A note should be provided to describe the repair, replacement, new cut-in or removed fitting or valve.

- Deductions for abandoned or replaced pipe should be noted on bottom of page.
- Abandoned mains are mains that are disconnected and left in place.
- Replaced mains are water mains that are removed and another main is installed in its place.
- Date, type of pipe, and who did work should be noted next to totals.

(f) Each Record Sketch page should show what is installed on each page. Overlap should be avoided. The totals of pipe installed on each page are the information that will be used to create the Geographical Information System (GIS) database.

2. Cut-in valve(s), fitting(s), service(s), hydrant(s) or other infrastructure/repair should be measured to another existing valve(s), fitting(s), service(s), hydrant(s) or other infrastructure/repair in order to locate it along the main.

3. All measurements should be with measuring tape (steel or cloth).

4. Record Sketch drafts shall be reviewed and entered into SWSC data systems as follows:

   (a) Capital Projects shall be reviewed by the Project Manager

   (b) Repairs, replacements, and main, valve, and hydrant installs by SWSC shall be reviewed by Senior Inspector

5. If there are no corrections or missing information the data will be entered into the Asset Management System.

6. Capital Projects, repairs, replacements, and main, valve, and hydrant installs by SWSC and/or Installers shall be scanned by the Inspection Group and entered into the Commission's Asset Management System.

   (a) Scanned documents should include Record Sketch copies with written valve numbers, Valve Forms, Hydrant Forms, and Foreman's Work Order documents.

   After entry into the Asset Management System the scanned documents should be submitted to the Commission's GIS group for review and entry into the GIS database. Submission shall be by attaching the documents to the GIS Review work order in the Commission's Asset Management System.

7. If corrections or missing information are found during any of the reviews steps the Record Sketch shall be returned to the Commission Inspectors and the needed information shall be added to the record sketch and resubmitted to the reviewer.

8. Always remember more information is better than not enough information when trying to locate Commission facilities.

4.2.6 Water Service Card

1. Water Service Card by Commission Inspectors shall be in accordance with the **Water Service Card Detail (W-16.1)** and include the following information on the front of the card:

   (a) Address number, street name and community, Owner, and a Service Record number at the top of the card.

   (b) Date and Work done should be in the middle of the card.

   (c) Ties to the primary shut-off valve should be in the bottom of the card and should begin with the type of valve box located in street or treebelt and over the primary shut-off valve, a minimum of four (4) ties with two (2) from either side of the main structure and one (1) out from the main structure and one (1) additional tie to another structure or permanent facility should be provided. Ties from street line and intersecting street lines are acceptable alternative or additional ties.

   (d) Distances to the valve(s) buried in street should be provided.

   (e) If the ball IK is made onto an existing or new ball corporation it should be noted in the tie. If there is no IK it should be noted that a ball corporation is tapped into the main.

2. Water Service Card by Commission Inspectors shall be in accordance with the **Water Service Card Detail (W-16.1)** and include the following information on the back of the card:

   (a) Water Service size, length, material, date installed, and who installed it should be at the top of the card.

   (b) The sketch should show street lines, water main(s) with diameter that the water service is connected to, structure, such as building or meter pit, the water service enters with address number if applicable, a second structure, or permanent facility, such as a hydrant or gate marker.

   (c) Ties to the primary shut-off valve should include a minimum of four (4) ties with two (2) from either side of the main structure and one (1) out from the

main structure and one (1) additional tie to another structure or permanent facility should be provided. Ties from street line and intersecting street lines are acceptable alternative or additional ties. Distances in feet and inches from center of each component.

(d) North arrow should be provided.

(e) Distances along the water service pipe to other or buried valves, copper to coppers, repairs, or other underground structures or crossings should be provided.

3. All measurements should be with measuring tape (steel or cloth).

4. Always remember more information is better than not enough information when trying to locate Commission facilities.

Section 4.3 Approvals

4.3.1 Site Plan Approval

1. A Status Memo that defines the status of project for all associated water and sewer mains, services, and appurtenances is written by ET&S.

2. The Status Memo is attached to the Final Site Plan(s) once the Proposed Site Plan(s) has met all Commission requirements.

3. The Applicant and/or Applicant's engineer is notified, by phone or email, once the Status Memo and final design plans are complete and available for pick-up at the Commission's Customer Field Services Office located at 71 Colton St., Springfield, MA.

4. The Applicant must pick up the Status Memo and Final Site Plan(s) and pay all required fees as described in the memo. Those fees may include, but not be limited to:

(a) remaining application fees,

(b) connection fees,

(c) tapping main fees,

(d) main shut down / turn on fees,

(e) service discontinuance fees,

(f) inspection fees, other construction related fees.

5. All Commission fees as set forth in the Commission's Schedule of Rates, Fees, and Charges in its Rules and Regulations are also available on line at http://www.waterandsewer.org/

6. It is highly recommended that the Installer receive the Contractor's copies of the Status Memo and Final Site Plan(s), as there are important records and instructions included.

7. The Status Memo, Final Site Plan(s), and any other attachments are also distributed to the Commission's Inspectors, Customer Service, Customer/Owner/Developer, Billing office, and the record file in E&TS's office.

4.3.2 Utility Installation Approvals

1. All installations of utilities adjacent to Commission water and sewer mains must be a minimum of 4-feet from the existing water and/or sewer main, edge to edge of pipe. Adjacent utilities may include but not be limited to underground conduits for cable, electric, fiber optic, gas, and telephone.

2. **Standard Details -** Standard offsets of utilities from Commission water and sewer mains shall be in accordance with the **Utility Separation Detail (W-01.0)** and Springfield DPW Street Typical Section for Utilities, unless otherwise approved as described below.

3. **Alternative Locations Approval** - To obtain Commission approval for alternative locations and offsets, plans shall be submitted for review and approval to the local DPW having jurisdiction and the Commission's Engineering and Technical Services Office in accordance with these Guidelines and Policies. This review and approval must be complete before the beginning of construction.

4. **Inspections and Enforcement –** Commission Inspectors will perform periodic inspections of utility installations for compliance with this policy. If encroachments are noted, the local DPW having jurisdiction will be notified for enforcement of their street occupancy permit requirements.

5. **Failure to comply** with this Policy due to encroachment into the offsets to water and/or sewer mains as described above may be cause for the removal of said conduits, pipes, and other property located within the encroachment area by the Commission. It may also result in the Commission or their agents relocating said conduits, pipes, and other property at cost to the encroaching utility, and possible removal of the contractor from the Commission Approved Contractor's List.

4.3.3 License Agreement Approval

1. One (1) draft License Agreement Form, attached in Section 15.1.4 of these Guidelines and Policies, will be submitted to the Commission's Engineering and

Technical Services (E&TS) for review and approval prior to the Status Memo, Final Site Plans, and any other attachments are distributed.

- A draft form of Surety, according to Section 4.3.4 of these Guidelines and Policies, will be submitted at this time as it is a requirement of the License Agreement.

2. E&TS and the Commission's legal Council will review the License Agreement. E&TS will contact the Applicant with any changes or corrections prior to the Applicant submitting the signed originals.
3. Two (2) original License Agreements shall be submitted and signed by the Applicant.
4. The Commission's Engineering and Technical Services (E&TS) will review the License Agreements and submit them to the Executive Director for Signature.
5. The Executive Director (or his/her designee) will sign the License Agreements.
6. One (1) original License Agreement will be attached to the Applicant's Status Memo.
7. One (1) original License Agreement will be filed at the Commission in the E&TS's Record Vault and one (1) copy will be filed in the street file in E&TS's office.

4.3.4 Surety Approval

1. One (1) draft form of a Surety document(s) will be submitted with the draft License Agreement to the Commission's Engineering and Technical Services (E&TS) for review and approval prior to the Status Memo, Final Site Plans, and any other attachments are distributed.

   (a) The Surety document(s) will be in the form of a Bond. Other forms of surety may be submitted in place of a Bond but must be approved prior to submittal.

   - Performance / Payment Bond shall be for the construction period until all water and sewer mains have been approved. The construction period shall be considered over on the date the final bacteria test for the water main and the pressure test for the sewer main have passed.
   - Maintenance Bond shall be after the construction period from time of all main approvals until end of warranty period, typically one (1) year minimum, but may be longer at the Commission's discretion. The warranty period shall be considered over after one (1) year, all installation issues including, but not limited to raising water and sewer structures, pavement (as it relates to the water and sewer installation), and the approval of the Town or City having jurisdiction of said paving have been addressed to the satisfaction of the

Commission, and an As-Built drawing, according to Section 4.2.4 of these Guidelines and Policies has been submitted and approved by the Commission.

- Originals of Sureties shall be attached as part of the License Agreement for the Commission

(b) The Surety document(s) shall be made out to the Springfield Water and Sewer Commission.

(c) The Surety document(s) shall not have an expiration date.

(d) The Surety document(s) shall be made out for the project.

2. E&TS and the Commission's legal Council will review the Surety document(s). E&TS will contact the Applicant with any changes or corrections prior to the Applicant submitting the signed original(s).
3. One (1) original Surety document(s) shall be submitted and signed by the Applicant.
4. The Commission's Engineering and Technical Services (E&TS) will review the Surety document(s).
5. One (1) original Surety document(s) will be filed at the Commission in the Billing Office, one (1) copy will be filed in the E&TS's Record Vault, and one (1) copy will be filed in the street file in E&TS's office.

4.3.5 Surety Release

1. The Commission's Billing Office will notify E&TS when any Surety Document is to expire.
2. E&TS will determine when the surety will be released and send notification to the Surety provider and Applicant. Copies of the release will be kept in each file.
3. Surety shall be released one (1) year from the date of water main acceptance for service, which will be the day that the final bacteria test passes and/or one year from the date of sewer main acceptance, which will be the day that the television inspection was completed and reviewed by the SWSC's Inspectors.
4. No surety shall be released if the Applicant has not completed the above and submitted an approved As-Built drawings on mylars to the Commission's E&TS.

Springfield Water and Sewer Commission

Guidelines and Policies

Section 4.4 Inspections for 1-inch to 2-inch Water Service (by Installers)

4.4.1 Installer Responsibilities at the Installation

1. The Owner or Installer shall have all Fees paid online at VASF@waterandsewer.org, before a Commission Work Order will be issued to have an installation inspected. Typically, single-family homes will require two (2) site visits for inspections. The Commission's Inspectors must have a Work Order issued by the Customer Service Office to perform an inspection.

2. The Owner or Installer shall call the Commission's Customer Service Office at 71 Colton Street, at 413-310-3500 to schedule the next available inspection appointment. A minimum 48-hours advance notice is required. The Customer Service Office at 71 Colton Street will schedule time slots during Regular Hours, at the Commission's discretion, and the water main installation shall be ready for inspection.

3. A responsible supervisor, as defined in Section 6.1.6 these Guidelines and Policies, of the Installer shall be on site at all times during an installation.

4. The responsible supervisor of the Installer shall have all the Commission issued paperwork including, but not limited to, receipts, plans, and memoranda, at the site at all times during an installation.

5. The Owner or Installer shall provide OSHA compliant safe access, including trench shoring and safe ladders if necessary, to all trenches. The Owner or Installer shall provide OSHA compliant safe access, including safe ladders to all foundations. Other areas that require inspection by the Commission Inspectors shall also be required to provide safe access as determined by the Inspectors.

6. The Owner or Installer shall have all work completed prior to when the Inspector arrives. If the work is not completed when the Commission Inspector arrives, the Owner or Installer must make additional repairs and schedule an additional inspection, at rates as set forth in the Commission's Rules and Regulations, by calling the Commission's Customer Service Office.

7. Inspection from water main to tree belt:

   (a) The tap at the main must be completed by the Commission in accordance with the 2-inch and less Water Service Installation Section of these Guidelines and Policies.

   (b) The copper tube shall be laid by the Installer from the shut-off valve at the main to the shut-off valve in the tree-belt prior to the Commission Inspectors arriving at the site.

(c) The Commission Inspectors must witness the water service pipe being flushed, the valve at the tree-belt being turned off, and the water service pipe, including all copper tube, fittings, and valves not having any water leaks at static line pressure.

- If leaks are observed by the Commission's Inspector, the Installer will be allowed to make minor repairs to stop the leak at this time. If the leak continues or the repair is not acceptable to the Commission Inspector, the Owner or Installer must make additional repairs and schedule an additional inspection at rates as set forth in the Commission's Rules and Regulations by calling the Commission's Customer Service Office.

(d) No work shall be backfilled before the water service installation is inspected and approved by the Commission's Inspectors.

8. Inspection from water main to house:

(a) The tap at the main must be completed by the Commission in accordance with the 2-inch and less Water Service Installation Section of these Guidelines and Policies.

(b) The copper tube shall be laid by the Installer from the shut-off valve at the main to the shut-off valve in the tree-belt and from the shut-off valve in the tree-belt to the meter valve in the building prior to the Commission Inspectors arriving at the site.

(c) The Commission Inspectors must witness the water service pipe being flushed, the meter valve in the building being turned off, and the water service pipe, including all copper tube, fittings, and valves not having any water leaks at static line pressure.

- If leaks are observed by the Commission's Inspector, the Installer will be allowed to make minor repairs to stop the leak at this time. If the leak continues or the repair is not acceptable to the Commission Inspector, the Owner or Installer must make additional repairs and schedule an additional inspection at rates as set forth in the Commission's Rules and Regulations by calling the Commission's Customer Service Office.

(d) No work shall be backfilled before the water service pipe is inspected by the Commission's Inspectors.

9. Inspections for complete Water Services from the main to the building that cannot be completed in a single day:

(a) Inspection of water service from shut-off valve at the main to the shut-off valve in the tree-belt shall be as described in Paragraph 8 of this Section, so that the Installer can backfill the trench in the street.

- No open trench shall be allowed in the street or right of way over night.

(b) Inspection of water service from the shut-off valve in the tree-belt to the end of the copper tube shall be left open until it is inspected and approved by the Commission's Inspectors.

(c) The Installer may backfill after each installation has been inspected and approved by the Commission's Inspector. The Installer shall not backfill over any connection, joints, and/or valves until the water service pipe is installed into the building and tested and approved.

(d) Inspection of water service from the shut-off valve in the tree-belt to the meter valve in the building, including all connections, joints, and/or valves shall be as described in Paragraph 8 of this Section, so that the Commission Inspectors can witness proper depth of cover and no leakage at joints.

4.4.2 Commission Responsibilities Prior to Arriving at the Installation

1. The Commission's Engineering and Technical Services Department will provide the Commission's Customer Service Office and Inspectors with copies of all reviewed plans, memoranda, and details associated with each installation.

2. The Commission's Customer Service Office will issue a work order to the Commission's Inspectors after the Owner or Installer has paid all fees and the time slot(s) that the installation will be inspected is scheduled.

3. The Commission's Inspectors will arrive at the installation during the time slot.

4. Typically, single-family homes will require inspections for the Water Service and Building Sewer Connection in accordance with Section 4.4.1 of these Guidelines and Policies. The Commission will allow up to two site visits for the Water Service Connection and up to two site visits for the Building Sewer Connection. The Owner or Installer shall pay for one Inspection Charge for the Water Service and one Inspection Charge for the Building Sewer.

   (a) The first inspection for the Water Service or Building Connection shall be from the main to the treebelt for each.

   (b) The second inspection for the Water Service or Building Connection shall be from the treebelt to the building for each.

(c) The trench and pipe(s) shall be safe and ready for inspection in accordance with Section 4.4.1 of these Guidelines and Policies.

4.4.3 Inspectors Responsibilities at the Installation

1. The Commission's Inspectors will visually inspect the job site and installation for unsafe conditions and/or inaccessible areas to be inspected.
2. The Commission's Inspectors will enter the Installer's OSHA compliant safe trench, confirm that all fittings are no-lead brass, and meet the Commission's Specifications.
3. The Commission's Inspectors will confirm shut-off in the tree-belt is closed.
4. The Commission's Inspectors will open shut-off valve at main and the Installer will partially open the shut-off valve in the treebelt to fill the Water Service Pipe with water.
5. The Commission's Inspectors check for leaks from main to shut-off valve in tree-belt.
6. The Commission's Inspectors will check backfill material. Common borrow/fill, as specified in the Commission's Specifications, shall be placed around the copper pipe.
7. The Commission's Inspectors will enter the building to open the meter valve, so the water service pipe is ready to be flushed.
8. The Commission's Inspectors will open shut off valve in tree-belt so that the water service pipe may be flushed. The Inspector will wait for the water to run clear before shutting the meter valve
9. The Commission's Inspectors will close the meter valve and perform visual leak test. The copper tube service line and valves shall not have any water leaks at static line pressure. The Owner or Installer may be allowed to make minor repairs during inspection so that any leaking joints may be tightened.
10. If any of the above items is not ready for inspection at the scheduled time slot or fails inspection, then the Commission Inspector shall notify the Owner or Installer that the inspection must be rescheduled. The Owner or Installer must schedule an additional inspection at rates as set forth in the Commission's Rules and Regulations by calling the Commission's Customer Service Office. The Commission's Customer Service Office will schedule the next available time slot during which the installation shall be ready for inspection.

11. The Commission's Inspectors will attach a completed meter valve tag to the meter valve inside the building after the inspection is complete and the meter is ready to be installed.

12. The Commission's Inspectors will close the shut-off valve in the tree-belt before leaving the site.

13. The Commission's Inspectors will leave the shut-off valve at the main open unless conditions exist that will not allow, such as leaks, improper installation, unapproved material, and/or other conditions as determined by the Commission's Inspector.

14. The Commission's Inspectors will take pictures, measurements, and ties including depths as defined in Section 4.4.4 of these Guidelines and Policies.

15. The Commission's Inspectors may remain on-site until the Owner or Installer has backfilled the water service pipe with a minimum of 8-inch of clean Common Borrow/Fill.

16. The Commission's Inspectors will send the Work Order back to Customer Service Office stamped "Complete" and signed by Inspector. This completed Work Order will be considered the Inspection Certificate, as defined in the Commission's Rules and Regulations. The completed Work Order will be filed at Customer Service Office.

4.4.4 Commission Record Requirements for 1-inch through 2-inch Water Service Installations

1. After each water service is installed, the Commission's Inspectors will inspect the installation, as defined in Section 4.4.3 of these Guidelines and Policies, prior to backfilling to record location and ensure proper depth and quality of workmanship.

2. The Commission Inspectors will take pictures of the installation. The Commission's Inspectors will keep the picture records for at least one (1) year.

3. The Commission's Inspectors will take location ties to all water service pipe valves by measuring and tying the location of each water box.

   (a) Measurements will be taken and recorded by the Commission's Inspectors when final paving is complete. Temporary ties may be required prior to finish paving.

   (b) Buried valves shall have at least three (3) ties to a permanent structure.

   (c) Temporary ties shall have at least three (3) ties to a permanent structure.

(d) Valves installed with a gate box or water service box shall have ties taken as follows:

- When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one tie will be taken one out from the structure.
- Monuments will be installed when a permanent structure is not available to take ties from. Monuments are Commission Gate Markers, property line pins or stone bounds, hydrants, or other permanent structure that is not a building.
- At least one other tie will be taken from another permanent structure such as another building, monument, or a hydrant.
- Also, a tie will be taken from street line, property line or edge of easement.

4. The Commission's Inspectors will measure locations along the length of the water service pipe to each bend, coupling, tee, cross, and/or any other type of fitting.

5. The Commission's Inspectors will measure the depth of water service pipe and location from street line, property line and/or edge of easement, if needed. Typically, the depth of pipe is needed if the pipe is not installed with five (5) feet of cover.

6. The Commission's Inspectors will include on the record sketch the size and type of water main, the street name, any side streets abutting the building property, and any unusual installation details.

7. The Commission's Inspectors will create a finished record sketch of the finished installation that is not to scale. The finished record sketch will be sent to Customer Service Office where it will be permanently filed.

Section 4.5 Inspections for 4-inch and Larger Water and Fire Service Installations

4.5.1 Installer Responsibilities

1. The Owner or Installer shall have all Fees paid online at VASF@waterandsewer.org, before a Commission Work Order will be issued to have a water or fire service installation inspected. Typically, the Commission will estimate the number of site visits required at about 100-feet per site visit. The Commission's Inspectors must have a Work Order to perform an inspection.

2. The Owner or Installer shall call the Commission's Customer Service Office at 71 Colton Street, at 413-310-3500 to schedule the next available inspection appointment. A minimum 48-hours advance notice is required. The Customer Service Office at 71 Colton Street will schedule time slots during Regular Hours,

at the Commission's discretion, and the water main installation shall be ready for inspection.

3. A responsible supervisor (as defined in the Control of Work Section below) of the Installer shall be on site at all times during an installation.

4. The responsible supervisor of the Installer shall have all the Commission issued paperwork including, but not limited to, receipts, plans, and memoranda, at the site at all times during an installation.

5. The Owner or Installer shall layout the new water or fire service installation according to the approved plan.

6. The Owner or Installer shall provide OSHA compliant safe access, including trench shoring and safe ladders if necessary, to all trenches.

7. The Owner or Installer shall provide OSHA compliant safe access, including safe ladders to all foundations.

8. The Owner or Installer shall have all work completed prior to when the Inspector arrives. If the work is not completed when the Commission Inspector arrives, the Owner or Installer must schedule an additional inspection, at rates as set forth in the Commission's Rules and Regulations, by calling the Commission's Customer Service Office.

9. Installation of water or fire service shall be as follows:

   (a) New water or fire service connection may be either by tapping an existing main or shutting an existing main and installing a mechanical joint tee, gate valve(s), and other fittings as required and shall be as follows:

   - The tap at the main must be completed by the Commission in accordance with the Tapping sleeve and Mechanical Joint Valve Section of these Guidelines and Policies.
   - The of shutting an existing main or water service(s) must be by the Commission and installing a mechanical joint tee, gate valve(s), and other fittings as required by the Installer in accordance with the Ductile Iron Fitting and Mechanical Joint Valve Sections of these Guidelines and Policies.

   (b) The ductile iron water or fire service shall be laid by the Installer from the new connection in accordance with the Ductile Iron Water Main Section of these Guidelines and Policies, prior to the Commission Inspectors arriving at the site.

   (c) No work shall be backfilled before the water or fire service installation is inspected by the Commission's Inspectors.

(d) The Springfield Fire Department must witness the fire service being flushed by the Installer.

(e) The Installer is responsible to schedule the fire department flush along with the Commission leak test, disinfection, and bacteria testing. The fire department flush shall be before the Commission pressure test and bacteria test.

(f) The Commission Inspectors must witness the water or fire service being leak tested by the Installer.

(g) The water or fire service shall not be Turned-on or put into service until the backflow preventer has been inspected by the Commission's Cross Connection Inspector.

4.5.2 Layout

1. The Owner or Installer shall have the road or easement to sub-grade, lot pins, and easement boundaries installed before any layout begins.
2. The Owner or Installer shall have the project laid-out according to plan, memo, and any attachments.
3. After a Work Order is received by the Inspectors from Customer Service then the layout can be field checked by the Commission's Inspectors.
4. The Commission's Inspectors will check the lay out of the project to confirm that it has been performed according to the plan, memo, and any attachments.

   (a) It shall remain the Owner's responsibility that the layout has been performed according to the plan, memo, and any attachments.

   (b) Construction cannot begin until the layout has been field checked by the Commission.

5. All questions to the Commission's Engineering and Technical Services.
6. Layout, at a minimum, includes:

   (a) Location of connection to existing facilities;

   (b) Location of new main, valves, hydrants, air valve assemblies, and other appurtenances on the plan;

   (c) Provide center line of water and/or sewer main;

   (d) Provide offset stakes that will not get damaged during construction and;

(e) Provide line stakes at end of main.

4.5.3 Inspection of Water or Fire Service Installation

1. Inspectors must inspect the installations daily prior to backfilling
2. Inspection includes that the pipe is installed and located according to the plan and at the proper depth.
3. Use the Ductile Iron Pipe Research Association (DIPRA) Installation Guide for Ductile Iron Pipe as a guide to inspect for properly installed water pipe.
4. Measure location along the length of the pipe to each bends, couplings, tees, crosses, and any other type of fittings.
   (a) Start at the beginning of the new work.
   (b) These measurements shall be taken prior to back filling.
   (c) Measure depth of pipe and location from street line, property line or edge of easement.
5. Take pictures of installation
6. Backfilling can begin.

4.5.4 Water or Fire Service into Service

1. After water or fire service and all other appurtenances are installed then the Inspectors will contact the water quality group to operate the valves to allow the main to fill and air bled out of the main.
   (a) For Water Services or Fire Services up to 2-inch the Installer shall have the correct meter valve installed before any testing being scheduled.
   (b) For metered Water Services 4-inch and larger that require a Back Flow Preventer the Installer shall have the correct Outside Spindle and Yoke (OS&Y) gate valve (building control valve) that is in accordance with the Commission's Material Specifications installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve onto the building control valve into the building for testing. The Installer may then schedule testing.
   (c) For Fire Services 4-inch and larger the Installer shall have the correct OS&Y gate valve (building control valve) that is in accordance with the Commission's Material Specifications installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve. The Installer may then schedule testing.

(d) Inspector will inform supervisor or call Water Quality Group.

(e) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.

2. The Springfield Fire Department must witness the fire service being flushed by the Installer.

   (a) The Installer is responsible to schedule the fire department flush along with the Commission leak test, disinfection, and bacteria testing.

   (b) The fire department flush shall be before the Commission leak test, disinfection, and bacteria test.

3. The Commission Inspectors must witness the water or fire service being leak tested by the Installer.

4. After leak test passes, Inspectors will contact the water quality group to operate the valves to flush water main and begin disinfection procedures according to Section 6.3 of these Guidelines and Policies.

   (a) Inspector will inform supervisor or call Water Quality Group.

   (b) The customer/owner/developer will supply all material to fill and bleed air out of water mains such as hoses, diffusers, erosion control, etc.

5. The Water Quality Group will sample for Cl2 residual, pH, and turbidity.

6. The Water Quality Group will call the lab to take bacteria samples.

7. The Lab will report to all Commission groups the bacteria results.

8. After two (2) consecutive bacteria tests passing the Water Quality Group will put the new water or fire service in service by:

   (a) Shutting all flush and sample sites.

   (b) Allow the Installer/owner/developer to remove all flushing equipment.

   (c) For water services with meter only the service shall not be Turned-on or put into service until the correct fittings and shut off valves are installed and has been inspected by the Commission's Inspector.

   (d) For water or fire services that require a backflow preventer the service shall not be Turned-on or put into service until the backflow preventer has been installed by the Installer and inspected by the Commission's Cross Connection Inspector.

(e) Open all water valves and notify all other Commission groups that the water or fire service is in service.

9. Paving may begin.

10. Location ties shall be taken to all valves, hydrants, and other operable appurtenances by measuring the location of each water box.

    (a) Start at the beginning of the new work.

    (b) These measurements shall be taken when final paving is complete. Temporary ties may be required prior to finish paving.

    (c) When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one out from the structure and at least one other tie from another permanent structure such as another building or a hydrant. In addition, a tie from street line, property line or edge of easement will be taken.

Section 4.6 Inspections for Water Main Installation (by Installers)

4.6.1 Installer Responsibilities

1. The Owner or Installer shall have all Fees paid online at VASF@waterandsewer.org, before a Commission Work Order will be issued to have a water main installation inspected. Typically, the Commission will estimate the number of site visits required at about 100-feet per site visit. The Commission's Inspectors must have a Work Order to perform an inspection.

2. The Owner or Installer shall call the Commission's Customer Service Office at 71 Colton Street, at 413-310-3500 to schedule the next available inspection appointment. A minimum 48-hours advance notice is required. The Customer Service Office at 71 Colton Street will schedule time slots during Regular Hours, at the Commission's discretion, and the water main installation shall be ready for inspection.

3. A responsible supervisor (as defined in the Control of Work Section below) of the Installer shall be on site at all times during an installation.

4. The responsible supervisor of the Installer shall have all the Commission issued paperwork including, but not limited to, receipts, plans, and memoranda, at the site at all times during an installation.

5. The Owner or Installer shall layout the new water main installation according to the approved plan.

6. The Owner or Installer shall provide OSHA compliant safe access, including trench shoring and safe ladders if necessary, to all trenches. The Owner or Installer shall provide OSHA compliant safe access, including safe ladders to all foundations.

7. The Owner or Installer shall have all work completed prior to when the Inspector arrives. If the work is not completed when the Commission Inspector arrives, the Owner or Installer must schedule an additional inspection, at rates as set forth in the Commission's Rules and Regulations, by calling the Commission's Customer Service Office.

8. Installation of water main shall be as follows:

   (a) New water main connection may be either by tapping an existing main or shutting an existing main and installing either a valve, solid sleeve, or coupling shall be as follows:

   - The tap at the main must be completed by the Commission in accordance with the Tapping sleeve and Mechanical Joint Valve Section of these Guidelines and Policies.
   - The of shutting an existing main must be by the Commission and installing either a valve, solid sleeve, or coupling must be by the Installer in accordance with the Ductile Iron Valve and Mechanical Joint Valve Sections of these Guidelines and Policies.

   (b) The ductile iron water main shall be laid by the Installer from the new connection in accordance with the Ductile Iron Water Main Section of these Guidelines and Policies, prior to the Commission Inspectors arriving at the site.

   (c) The Commission Inspectors must witness the water main being pressure tested by the Installer.

   (d) No work shall be backfilled before the water main installation is inspected by the Commission's Inspectors.

4.6.2 Layout

1. The Owner or Installer shall have the road or easement to sub-grade, lot pins, and easement boundaries installed before any layout begins.

2. The Owner or Installer shall have the project laid-out according to plan, memo, and any attachments.

3. After a Work Order is received by the Inspectors from Customer Service then the layout can be field checked by the Commission's Inspectors.

4. The Commission's Inspectors will check the lay out of the project to confirm that it has been performed according to the plan, memo, and any attachments.

   (a) It shall remain the Owner's responsibility that the layout has been performed according to the plan, memo, and any attachments.

   (b) Construction cannot begin until the layout has been field checked by the Commission.

5. All questions to the Commission's Engineering and Technical Services.

6. Layout, at a minimum, includes:

   (a) Location of connection to existing facilities;

   (b) Location of new main, valves, hydrants, air valve assemblies, and other appurtenances on the plan;

   (c) Provide center line of water and/or sewer main;

   (d) Provide offset stakes that will not get damaged during construction and;

   (e) Provide line stakes at end of main.

4.6.3 Inspection of Water Main Installation

1. Inspectors must inspect the installations daily prior to backfilling
2. Inspection includes that the pipe is installed and located according to the plan and at the proper depth.
3. Use the Ductile Iron Pipe Research Association (DIPRA) Installation Guide for Ductile Iron Pipe as a guide to inspect for properly installed water pipe.
4. Measure location along the length of the pipe to each bends, couplings, tees, crosses, and any other type of fittings.

   (a) Start at the beginning of the new work.

   (b) These measurements shall be taken prior to back filling.

   (c) Measure depth of pipe and location from street line, property line or edge of easement.

5. Take pictures of installation
6. Backfilling can begin.

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4.6.4 Water Main into Service

1. After water main and all other appurtenances are installed then the Inspectors will contact the water quality group to operate the valves to allow the main to fill and air bled out of the main.

   (a) Inspector will inform supervisor or call Water Quality Group.

   (b) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.

2. Inspectors must witness pressure tests.

3. After pressure test passes, Inspectors will contact the water quality group to operate the valves to flush water main and begin disinfection procedures according to Section 6.3 of these Guidelines and Policies.

   (a) Inspector will inform supervisor or call Water Quality Group.

   (b) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.

4. The Water Quality Group will sample for Cl2 residual, pH, and turbidity.

5. The Water Quality Group will call the lab to take bacteria samples.

6. The Lab will report to all Commission groups the bacteria results.

7. After two (2) consecutive bacteria tests passing the Water Quality Group will put the new water main in service by:

   (a) Shutting all flush and sample sites.

   (b) Allow the Installer/owner/developer to remove all flushing equipment.

   (c) Open all water valves and notify all other Commission groups that the water main is in service.

8. Paving may begin.

9. Location ties shall be taken to all valves, hydrants, and other operable appurtenances by measuring the location of each water box.

   (a) Start at the beginning of the new work.

   (b) These measurements shall be taken when final paving is complete. Temporary ties may be required prior to finish paving.

(c) When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one out from the structure and at least one other tie from another permanent structure such as another building or a hydrant. In addition, a tie from street line, property line or edge of easement will be taken.

10. After water main is put into service and the Inspectors and Customer Service are notified by the Water Quality Group, the Commission's Construction Crew and/or the Installer will begin to install individual water services to each home.

Section 4.7 Inspections for Water Main Installation (by Commission)

4.7.1 Layout

1. After a Work Order is received by the Inspectors from Customer Service then the layout can begin.
2. Inspectors shall lay out the center-line of the trench in the roadway and/or easement, and all other appurtenances, such as, but not limited to; water mains, valves, hydrants, air valves and/or air corps, and water services according to plan, memo, and any attachments.
3. The Commission's Construction Crew supervisor shall have the trench marked out after the centerline and other appurtenances are laid out by the Inspectors.
4. Construction cannot begin until the layout has been completed.
5. All questions to the Commission's Engineering and Technical Services.
6. Require sub grade and lot pins before any layout begins.
7. Layout, at a minimum, includes:

(a) Location of connection to existing facilities;

(b) Location of new main, valves, hydrants, air valve assemblies, and other appurtenances on the plan;

(c) Provide center line of water and/or sewer main;

(d) Provide offset stakes that will not get damaged during construction and;

(e) Provide line stakes at end of main.

4.7.2 Inspection of Water Main Installation

1. Inspectors must inspect the installations daily prior to backfilling

2. Inspection includes that the pipe is installed and located according to the plan and at the proper depth.
3. Use Ductile Iron Pipe Research Association (DIPRA) Installation Guide for Ductile Iron Pipe as a guide to inspect for properly install water pipe.
4. Measure location along the length of the pipe to each bends, couplings, tees, crosses, and any other type of fittings.
   (a) Start at the beginning of the new work.
   (b) These measurements shall be taken prior to back filling.
   (c) Measure depth of pipe and location from street line, property line or edge of easement.
5. Take pictures of installation
6. Backfilling can begin.

4.7.3 Water Main into Service

1. After water main and all other appurtenances are installed then the Inspectors will contact the water quality group to operate the valves to allow the main to fill and air bled out of the main.
   (a) Inspector will inform supervisor or call Water Quality Group.
   (b) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
2. Inspectors must witness pressure tests.
3. After pressure test passes, Inspectors will contact the water quality group to operate the valves to flush water main and begin disinfection procedures according to Section 6.3 of these Guidelines and Policies.
   (a) Inspector will inform supervisor or call Water Quality Group.
   (b) The customer/owner/developer shall supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
4. The Water Quality Group will sample for Cl2 residual, pH, and turbidity.
5. The Water Quality Group will call the lab to take bacteria samples.
6. The Lab will report to all Commission groups the bacteria results.

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7. After two (2) consecutive bacteria tests passing the Water Quality Group will put the new water main in service by:

   (a) Shutting all flush and sample sites.

   (b) Allow the Installer/owner/developer to remove all flushing equipment.

   (c) Open all water valves and notify all other Commission groups that the water main is in service.

8. Paving may begin.

9. Location ties shall be taken to all valves, hydrants, and other operable appurtenances by measuring the location of each water box.

   (a) Start at the beginning of the new work.

   (b) These measurements shall be taken when final paving is complete. Temporary ties may be required prior to finish paving.

   (c) When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one out from the structure and at least one other tie from another permanent structure such as another building or a hydrant. In addition, a tie from street line, property line or edge of easement will be taken.

10. After water main is put into service and the Inspectors and Customer Service are notified by the Water Quality Group, the Commission's Construction Crew and/or the Installer will begin to install individual water services to each home.

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CHAPTER 5 SAFETY

Section 5.1 General

1. All Commission employees, interns, contractors hired by the Commission, and visitors approved by the Commission are required to follow all applicable Commission Health and Safety policies, as well as, local, state and federal regulations, including but not limited to the Massachusetts Department of Labor Standards and Occupational Safety and Health Administration.
2. The Commission Guidelines and Policies do not supplant the Installer's obligation to comply with all applicable local, state, and federal regulations, including but not limited to, the Department of Labor Standards and Occupational Safety and Health Administration.
3. Construction site safety and compliance with applicable regulations is the responsibility of the Owner and Installer.

Section 5.2 Trenching/Excavation - Additional Requirements

1. In addition to OSHA CFR 1926 Subpart P and MA 520 CMR 14 (Jackie's Law), employees of the Springfield Water and Sewer Commission will not enter any trench or excavation greater than four feet without acceptable cave-in prevention system.
2. Should a contractor, Installer or Owner require the assistance of an SWSC employee inside a trench or excavation, the cave-in prevention system must meet Commission's four foot requirement.

Section 5.3 Underground Utility Location (DIG SAFE) Requirements:

1. Massachusetts state law requires anyone who digs to notify utility companies before starting to excavate. Digging can be dangerous and costly without knowing where underground facilities are located.
2. Before making any cuts or excavating below ground begins, the Commission Construction Crew, Installer or any other Person(s) excavating in the Commission's Service Area shall notify all utility companies by contacting DIG SAFE at 1-888-DIG SAFE and any Non-member utilities, in accordance with the Massachusetts Dig Safe Law, MGL Chapter 82, Sec. 40A – 40E, and 220 CMR 99.00.

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3. The Commission's Service Area is shown on the applicable Service Area Maps: Springfield Water Mains Service Area Map (M-1.0), Ludlow Water Mains Service Area Map (M-2.0), Water Transmission Mains Service Area Map (M-3.0 & 3.1), or Springfield Sewer Mains Service Area Map (M-4.0).

4. The following, but not limited to, list of utilities are not part of DIG SAFE, are in the Commission's Service Area, and must be notified separately for any construction activity in the Commission's Service Area:

   (a) Springfield Fire Department – Alarm Division: 413-787-6410

   (b) Springfield Park Department: 413-787-6440

   (c) Ludlow Department of Public Works: 413-583-5625

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CHAPTER 6 WATER MAINS AND APPURTANANCES

Section 6.1 Control of Work

6.1.1 General

1. No work may begin without a Street Occupancy Permit from the Springfield Department of Public Works, a Dig Permit from the Town of Ludlow Department of Public Works, or the Publics Works Department having jurisdiction at the site to be excavated.

2. The Commission's Cross Connection Control requirements, as set forth in the Commission's Rules and Regulations, and in accordance with CHAPTER 10 of these Guidelines and Policies, and the Commission's Material Specifications must be followed at all times.

3. At all times, it is the responsibility of the Commission's Construction Crew or Installer to guarantee the sanitary and clean internal condition of all pipe and fittings and lubricants and materials that will come in contact with the drinking water. Contaminated materials may be rejected for use by the Commission. The use of temporary plugs while laying water mains is mandatory.

4. Failure to meet the requirements for cleanliness or the Material Specifications for materials may result in removal of the pipe or other components from the construction site and the rejection of its use by the Commission.

5. Distribution system pipe shall be at least 8-inches in diameter, thickness class 52 ductile iron pipe, cement lined, and asphaltic coated per AWWA Standards, unless otherwise approve by the Commission. 6-inch diameter may be allowed with the Commission's approval in accordance with Section 4.2.3 of these Guidelines and Policies. The pipe shall be in accordance with the Commission's Material Specifications unless otherwise approved by the Commission.

6. Pipe used for hydrant branches shall be at least 6-inches in diameter, shall be thickness class 52 ductile iron pipe, cement lined, and asphaltic coated per AWWA and shall be restrained the entire length of the branch. Pipe used for sprinkler lines shall be at least 6-inches in diameter, unless it can be documented that a different size line will meet design specifications and shall meet the above specifications.

7. When a conflict exists between the new or proposed water main and a sewer main or other utility requiring protection than the sewer main or other utility shall be encased in concrete and installed in accordance with the **Concrete Encasement Detail (S-03.0),** unless otherwise approved by the Commission.

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6.1.2 Valve Operation

1. Prohibition of Valve Operations

   (a) No existing transmission or distribution valves or hydrants may be operated by the Installer. It is a serious offense to tamper with the drinking water system and any violation will result in penalties as defined in the Commission's Rules and Regulations and removal from the Commission Approved Contractors list.

   (b) Only Commission employees or the Commission's designee may operate any valves connected to the Commission's transmission or distribution system.

2. General

   (a) The Commission's Construction Crew shall locate and operate all valves as needed for any type of work involving the operation of valves.

   (b) Prior to operating valves customers in vicinity of job shall be notified to avoid service disruption and customer complaints.

   (c) The Commission's Construction Crew shall note all valves operated and report this information to the Commission's Customer Service office. At a minimum this information shall include the following:

   - Person's name doing the job.
   - The location/project name.
   - Date and time.
   - The valve/hydrant location(s) and number(s) being worked on.
   - The position (open or closed) of the valve(s) found, also note if the valve is inoperable.
   - Number of turns to open and to close the valve.
   - The final position (open or closed) of the valve(s) at the end of the job.

   (d) When the job is complete, all valves shall be returned to their normal position and this information shall be reported to the Commission's Customer Service office and properly recorded on the Foreman's Return and work order system.

3. Scheduled shutdowns, other than routine work including, but not limited to capital improvement projects, swabbing, flushing, water main replacement, valve repair and/or replacement require review and approval of the Executive Director, Chief Engineer, Director of Field Services, and/or Deputy Director of Field Service prior to any valves being operated. At a minimum the following shall be submitted:

(a) Reason for the scheduled shutdown.

(b) Estimated length of time the shutdown will take.

(c) Valve numbers and locations.

(d) A distribution or transmission map with the valves highlighted.

(e) Number of customers affected.

(f) Existing closed valves in the vicinity of the proposed scheduled shut down.

4. Valves shall be operated as follows:

(a) Check for any potential hazards, i.e., traffic, pedestrians, construction, etc., and take the necessary safety precautions.

(b) Locate the valve using the Commission's Distribution Book and Commission valve ties. If the valve box is not visible use a metal locator to find the valve box.

- ***Caution:*** Check the Distribution Book to verify that the valve can be operated safely, not shut off any customers, and not cause damage to any roadbeds, pavement, landscaping, etc. The valve could be an Air Valve Assembly, a drain valve, supply a dead-end water main, and/or supply a critical customer.

(c) Remove the valve box cover by lifting or prying it up with a pry-bar(s), or pick, and, if necessary, strike the lid with a hammer.

(d) Inspect the box to see if the box is in good condition and free of debris.

(e) If debris is found clean out the debris so the operating nut can be accessed.

(f) Visually inspect the grade of the valve box as compared to the surface grade. Make note of any adjustments that may be required on the Foremen's Return, or if possible, adjust valve box to match the surface grade.

(g) If possible, open a fire hydrant closest to the valve so that discolored water caused by operating valves is allowed discharge. Direct the discharged water flow towards a catch basin or in the downhill direction. Make sure the discharged water is not causing property damage or flooding.

(h) Lower the valve key onto the valve nut.

(i) Turn the key clockwise to the right (on most valves) to find out the position of the valve. If you can't turn the key any further to the right, the valve should be open.

- ***Note:*** Some valves may be counter-clockwise to the left to open.
- Check with Customer Service, check the Vueworks Data Base and/or the old Gate Card, or contact Supervisor for guidance.

(j) Operate the valve to the "closed" position, by turning the valve nut counter-clockwise (to the left) in most areas. ***Close the valve slowly.*** Count the number of turns obtained and compare to the current Commission Valve Data Base, and/or the Gate Card. If the correct number of turns is not achieved, repeat the operation until the correct number is achieved or investigate to ensure the current Commission Valve Data Base, and/or the Gate Card is correct.

(k) Place a Sonophone on the valve key and check for any hissing noise (indicating leaks at the valve seat).

(l) A maximum leakage at any shut down should not exceed 100-gallons per minute (gpm). The Commission Construction Crew and/or Installer shall have pumps or other approved means of dewatering available to control leakage of 100-gpm.

(m) Install a Tag-out device in the valve box. If the valve is to remain closed for construction or energy reduction purposes then the valve shall be Locked-out in accordance with Section 6.1.3 of these Guidelines and Policies.

(n) When the valve is to be opened, remove the Tag-out device then the valve shall be slowly and fully opened by turning the valve nut clockwise (to the right), and then turn the valve counter-clockwise (to the left) one-half turn from the open position to relieve pressure from the stem, bonnet and packing.

(o) Again, place the Sonophone on the valve key and check for any hissing noise (indicating leaks at the stuffing box or valve body).

(p) If the valve was found closed, check the current Commission Valve Data Base, and/or the Gate Card, then check with a Supervisor to determine the position the valve should be left in. If the valve is to be opened check with Water Quality to determine if flushing is required prior to the valve being opened.

6.1.3 Valve Lock-out

1. All valves that remain in the closed position for construction or energy reduction purposes shall be locked out with a Lock-out/Tag-out device in accordance with OSHA CFR 1910.147 – Control of Hazardous Energy.
2. The Lock-out/Tag-out device shall have, at a minimum the work order number and Commission employee and phone number responsible for the valve being closed.

3. The Lock-out/Tag-out shall not be removed unless the Commission employee or their supervisor responsible for the valve being closed approves the Lock-out/Tag-out device being removed, and the valve being opened.

6.1.4 Labor, Materials, and Equipment

1. The Installer shall furnish labor, materials, and equipment that is appropriate to accomplish quality work in an efficient and timely manner. Sufficient resources must be committed to the work to ensure a rate of progress that will enable completion within established timelines.
2. All equipment requiring special licenses shall be operated only by persons who possesses a current, valid license for that piece of equipment

6.1.5 Private Land

1. When the Commission Construction Crew or Installer have to enter private land and private residences in order to accomplish the work. The Commission Construction Crew or Installer shall plan the work to ensure the Owner or the Owner's authorized representative is on site to permit the Commission Construction Crew or Installer and his/her employee's access to the Premises.
2. The Commission Construction Crew or Installer must ensure that Premises are left neat and clean after job completion.
3. In all homes and businesses, the Commission Construction Crew or Installer shall take all necessary precautions to ensure that theft or damage does not occur during work activities.

6.1.6 Supervision

1. The Installer shall have, on site, at all times during the work activities, a full time competent Foreman who shall be in charge of the project. This Foreman shall be the agent for the Installer on site, and shall coordinate inspections, record keeping, future work, and other issues with the Field Inspector assigned by the Commission to inspect the work.
2. The Installer shall notify the Commission in writing whenever there is a change in Foremen.

6.1.7 Existing Underground Utilities and Structures

1. The Commission Construction Crew or Installer shall refer to Section 5.3 of these Guidelines and Policies for more information concerning DIG SAFE.

2. The Commission Construction Crew or Installer shall determine the location or absence of all underground utilities, and plan and conduct his work operations to ensure that those utilities shall not be damaged.

3. The Commission Construction Crew or Installer shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, and services to buildings, mail boxes, utilities, gas pipes, water pipes, hydrants, sewers, drains, and cables, whether on private or public property.

4. Any damage resulting from the Installer's operations shall be repaired at the Installer's expense.

6.1.8 Delivery, Storage, and Handling

1. New pipe, fittings, valves, hydrants, and other appurtenances shall be delivered to the construction site as close in time to installation as possible.

2. All pipe shall be shipped with lifts separated by work separators such that, pipe to pipe contact is prevented during the transit and/or storage of the pipe.

3. Care shall be taken during the loading, trucking, unloading and handling of all pipe, fittings, and other appurtenances so as not to damage the materials or surrounding area.

   (a) Pipe, fittings, and other appurtenances shall not be dropped directly from the truck to the ground.

   (b) The Commission's Construction Crew or Installer is responsible for any pipe, fittings, and other appurtenances damaged during delivery, handling or storage.

   (c) A pipe clamp with protective coating is a preferred means to handle pipe, but forks may be used during the unloading process provided care is taken not to damage the pipe. Forks shall not be used in the interior of the pipe to handle pipe.

   (d) All damaged materials will be removed from the site immediately.

4. All pipe, fittings, and other appurtenances shall be stored in a manner that prevents water on the ground (run-off or puddles), debris, and/or animals from entering the material and prevent damage to the material and/or others' property.

   (a) Pipe may not be strung along the line of work unless approved by a Commission representative.

(b) Materials must be stored in such a manner that it does not obstruct driveways, sidewalks, etc.

(c) The Installer shall contact the Department of Public Works having jurisdiction to determine if it is permitted to string materials along the roadway of the work.

(d) Materials that have had water, debris, and/or animals will be removed from the site.

5. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a boom, straps, or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings or linings.

   (a) Under no circumstances shall chains be used, or material be dropped or dumped into trench.

   (b) Use of forks to handle pipe at construction sites is not allowed. Unless approved by the Commission.

Section 6.2 Product Installation

6.2.1 Ductile Iron Water Main

1. The new or proposed water main shall be located in the street in accordance with **Utility Separation Detail (W-01.0)**.
2. Ductile iron water main shall be bedded and installed in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**.
3. All water mains shall be installed in accordance with DIPRA Installation Guide for Ductile Iron Pipe and these Guidelines and Policies.
4. All pipe, fittings, valves and appurtenances shall be wrapped in 8-mil Polyethylene Encasement (PE) and shall be installed as required by the Commission and in accordance with DIPRA Installation Guide for Ductile Iron Pipe and Section 6.2.2 these Guidelines and Policies.
5. Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission's Health and Safety Policies.
6. Trenches must be kept free of excessive water during installation of pipe and fittings.
7. A visual inspection of the interior of each pipe length and fitting must be made before the pipe is installed. Any entry of contaminants, such as water and / or soil,

into a pipe or fitting while in the trench must be reported to the Commission's Authorized Field Representative and an approved corrective action taken. All pipe and fittings with internal coatings will be thoroughly cured, not tacky to the touch, before installation.

8. Thoroughly clean the groove and bell socket and insert the gasket, making sure that it faces the proper direction and that it is correctly seated.

9. If pipe or fittings become contaminated by environmental water, trench water or soil, backfill material, trash or the like, the pipe or fittings shall not be used until the Commission Representative is notified and a reasonable technique for cleaning is approved. This could involve onsite use of hydraulically propelled foam pigs or swabs, followed by chlorination. The Commission reserves the right to reject contaminated pipe and fittings from use.

10. All cut-in pipe and fittings must be swabbed or sprayed with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness. The installed couplings, pipe, and/or fittings shall be disinfected according to Section 6.4.5 of these Guidelines and Policies.

11. All components to be cut-in to an existing water main shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.

12. New or replacement water mains and/or water services installed within 200-feet of a Fuel Storage Tank (FST) and/or if the water main and/or water service is to traverse an area saturated with low molecular weight petroleum products (contaminated soils) it shall be installed with fluorocarbon gaskets, in accordance with the Commission's Material Specifications, and as follows:.

    (a) Fluorocarbon gaskets are required within the 200-foot radius from the FST or as required by the Commission.

    (b) Fluorocarbon gaskets are required through the contaminated soil and 100-feet beyond the contaminated soil, on each side or as required by the Commission.

13. Only lubricants that meet the Commission's Material Specifications may be used in the installation of the pipe. Clean, disposable applicators shall be used for the application of the lubricant to the gaskets. Used lubricant shall be discarded after every job.

14. Packing materials and gaskets and lubricants shall be kept clean at all times.

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15. After cleaning dirt or foreign material from the plain end, apply lubricant supplied by the pipe manufacturer in accordance with their recommendations. The lubricant is supplied in sterile cans and every effort shall be made to keep it sterile.

16. Plain end must be beveled; square or sharp edges may damage or dislodge the gasket and cause a leak. The plain end of field cut pipe must be beveled approximately a ¼-inch and at a 30-degree angle with a heavy file, grinder or pipe saw to remove all sharp edges. Recoat all cut ends with bitumastic when used for push-on joint.

17. Push the plain end into the bell of the pipe. Keep the pipe straight while pushing. Make deflection after the joint is assembled.

18. Pipe can be pushed into the bell socket with a long bar, a pipe jack, lever puller or backhoe. The pipe supplier may provide a pipe jack or lever puller on a rental basis. A timber header will be used between the pipe and jack or backhoe bucket to avoid damage to the pipe.

19. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing, or other material (or people) shall be placed in the pipe at any time.

20. All pipe and fittings in trenches will be protected from contamination entering the internal parts upon any length of delay of construction, at the end of every working day, and upon the threat of water in the trench. The open ends of all pipe and fittings must be plugged with a watertight seal at the end of every working day.

21. Temporary pipe plugs. At times when work is not in progress, the open end of the pipes shall be closed by means of a watertight plug or other means acceptable to Commission. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe floatation should the trench fill with water.

22. Pipe placement. As each length of pipe is placed in the trench, the joint shall be assembled, and the pipe brought to correct line and grade. The pipe shall be placed on raised common fill about 18-inch behind the bell or the bedding shall be excavated 2-inches to 6-inches at the bell prior to backfilling, in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**.

23. When rock excavation is necessary, the rock shall be removed to provide at least 6-inches of clearance below and on each side of the pipe, valves, and fittings for pipe sizes 24-inch or smaller. For larger pipes, the clearance shall be at least 9-inches.

(a) When excavation is complete, a layer of appropriate backfill material, in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4),** shall be placed on the bottom of the trench and compacted and leveled to provide proper depth of cover.

(b) These clearances eliminate potential creation of stress points that could cause pipe failure.

24. Direction of bells: It is common practice to lay pipe with the bells facing the direction in which work is progressing.

25. Maximum cumulative (horizontal and vertical planes) pipe deflection is listed below:

Pipe Size (Diameter in inches)	Deflection Angle (in degrees)	Maximum Allowable Offset (in inches) *
3 – 12	4	15
14 & 16	3.2	12
18+	2.4	9

* For 18-foot pipe lengths, measured at the end of the pipe.

26. Any deviation in joint deflection in excess of the above stated amount must be approved by the Commission representative.

27. All water mains shall be installed with a minimum cover of 5-feet. Any installation with less than 5-feet of cover shall require approval by the Commission representative. If insulation is required it shall be installed in accordance with Section 6.2.2 of these Guidelines and Policies.

28. When crossing other utilities, the Commission Construction Crew or Installer shall install the water main in accordance with **Utility Crossing Detail (S-03.0**), unless otherwise approved by the Commission.

29. The installed pipe shall be disinfected according to Section 6.3 of these Guidelines and Policies.

30. Backfill to be installed in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**, and the following:

(a) The pipe embedment material shall be placed in 6-inch layers above top of pipe and hand compact to a point 12-inches, minimum, above the top of pipe.

(b) Materials placed in the trench from the pipe embedment materials shall be Common Borrow Fill, according to the Commission's Material Specifications and shall be mechanically compacted. Common Borrow Fill shall be free from large clods, rocks and cinders.

(c) Backfill shall be graded with the placement of suitable soil material, as determined by the Commission Representative, in 12-inch (maximum) layers compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.

(d) Any backfill area that does not conform to the above to the compaction requirement shall be replaced and tests performed again.

31. Commission construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.

32. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

33. Air Valve Assemblies and Air Corporations shall be installed at the following locations and as described, unless otherwise approved by the Commission's Engineering and Technical Services:

    (a) When required by the Commission's E&TS, a 1-inch air valve assembly or 1-inch air corporation shall be installed at the beginning of the water main installation to allow for disinfection of the water main. The air valve assembly shall be installed in accordance with **Air Valve Assembly Detail (W-03.0, W-03.1, or W-03.2)** in accordance with Section 6.2.2 of these Guidelines and Policies, unless otherwise approved by the Commission.

    (b) An air valve assembly shall be installed at the end of each dead end main, unless otherwise approved by the Commission's E&TS. The size of the air valve assembly shall be a 2-inch corporation and 2-inch drilled IK with 2-inch brass pipe or as specified by the Commission representative. The air valve assembly shall be installed in accordance with **Air Valve Assembly Detail (W-03.0, W-03.1, or W-03.2)** and in accordance with Section 6.2.2 of these Guidelines and Policies, unless otherwise approved by the Commission. The dead end main shall be installed in accordance with **End of Main Detail (W-04.0 or W-04.1)**.

(c) An air valve assembly shall be installed at all high points on the pipeline and/or other locations approved by the Commission's E&TS. If a high point is created by the Commission's Construction Crew or Installer at a point other than those designated on the plans, the Commission's Construction Crew or Installer shall install a release valve at said high point. The air valve assembly shall be installed in accordance with **Air Valve Assembly Detail (W-03.0, W-03.1, or W-03.2)** and in accordance with Section 6.2.2 of these Guidelines and Policies, unless otherwise approved by the Commission.

(d) At a minimum, a 1-inch air corporation shall be installed on each side of newly installed valves. After the water main is in service the Air Corporations shall be left shut, capped with a brass cap, and buried. The air corporation shall be installed in accordance Section 6.2.6 of these Guidelines and Policies, unless otherwise approved by the Commission.

6.2.2 Polyethylene Encasement

1. Install polyethylene (PE) encasement around ductile iron pipe in accordance with pipe manufacturer's recommendations, ANSI/ AWWA C105/A21.5, Method 'A' in section 2.15 of DIPRA's Installation Guide for Ductile Iron Pipe, and the following, unless otherwise approved by the Commission:
2. Method A requires one length of PE tube to be used for each length of pipe and is overlapped at each joint.
3. When lifting polyethylene-encased pipe, use a fabric-type sling or a suitably padded cable or chain to prevent damage to the polyethylene. Be careful not to damage the polyethylene when handling or jointing the pipe.
4. The section of PE tube shall be cut to length to overlap each joint by approximately 2-feet.
5. The pipe shall be clean of all foreign material such as dirt, clay, mud, or other materials. In wet, sloppy trench conditions, the pipe should be completely covered by the polyethylene tube before it is lowered into the trench.
6. Slip the PE tube around the spigot end of the pipe and bunch the PE tube in accordion fashion near the spigot end. Make sure to pull the PE tube back so that it clears the spigot end.
7. Lower the pipe in the trench. Make sure there is a shallow hole in the trench bottom at the joint location to ensure overlapping the PE encasement. Install the spigot end of the pipe into the bell of the already installed pipe.

8. Move the cable to the bell end of the pipe to spread the tube over the entire barrel of the pipe. Push back both ends of the tube until they clear both pipe ends. Make sure the tube is centered on the pipe to provide a one-foot overlap at each end.

9. Overlap the tube end of the new pie with the tube end of the installed pipe. Secure the new tube end in place with tape.

10. Take up slack in the tube to make a snug, but not tight, fit. Circumferential wraps of tape or plastic tie straps should be placed at 2-foot intervals along the barrel of the pipe to help minimize the space between the polyethylene and the pipe. Wrap a piece of tape or plastic tie strap completely around the pipe at each end to seal the polyethylene, leaving ends free to overlap the adjoining sections of pipe. Seal ends of overlap by wrapping tape or plastic tie straps completely around the pipe at each end

11. A fabric type or padded sling shall be used when handling polyethylene encased pipe to prevent damage to the polyethylene encasement.

12. All seams in the polyethylene encasement shall be sealed completely with approved 2-inch wide plastic adhesive tape.

13. Extreme care shall be taken to ensure that all rips or tears in the polyethylene encasement are properly repaired with additional tape and film as described in ANSI/AWWA C105/A21.5

14. Extreme care shall be taken when backfilling to avoid damaging the polyethylene encasement.

15. Appurtenances:

    (a) Pipe-shaped appurtenances such as bends, reducers, offsets, and other pipe-shaped appurtenances shall be covered in the same manner as the pipe.

    (b) Odd-shaped appurtenances such as valves, tees, and crosses shall be covered with a flat sheet or split length of polyethylene tube by passing the sheet under and then over the appurtenance and bringing it together around the body of the appurtenance. Make seams by bringing the edges of the polyethylene together, folding over twice, and taping them down.

    (c) Joints of pipe-shaped and odd-shaped appurtenances shall be overlapped as in the pipe installation above; then tape the polyethylene securely in place at valve stems and other penetrations. When bolted-type joints are used, care should always be taken to prevent bolts or other sharp edges of the joint configuration from penetrating the wrap.

(d) Water services, air corps, and air valve assemblies shall be tapped through the polyethylene-encasement of the Ductile Iron pipe, unless otherwise approved by the Commission. Tapping through the PE encasement involves wrapping two or three layers of polyethylene adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted. Then install the corporation stop directly through the tape and polyethylene. After the tap is made inspect the entire circumferential area for damage and make any necessary repairs. When tapping through the PE encasement is not possible an X-shaped cut in the polyethylene shall be made and the PE shall be temporarily folded back. After installing the appurtenance, tape the slack securely to the appurtenance and repair the cut and any other damaged areas in the polyethylene with tape.

6.2.3 Pre- Insulated Pipe

1. Pre-insulated Pipe Insulation for Water Main or Water Service Pipe installed with less than 5-feet of cover and shall be as follows, unless otherwise approved by the Commission's E&TS:

   (a) Pre-insulated pipe, in accordance with the Commission's Material Specifications shall be provided when pipes are to be installed with less than 5-feet of cover. The insulated pipe system shall be installed wherever the depth of water pipe has less than 5'-0" of cover and above grade or across the bridge span.

   (b) Insulated ductile iron water pipe shall be installed in accordance with the requirements of Section 6.2.1 and the following additional requirements.

   (c) All insulated water pipe shall be handled with additional care to prevent damage to the protective jacket. Damaged jackets and insulation will be replaced at the Installers expense.

   (d) Installation shall not take place when temperatures are below -30º F (-34º C).

   (e) Bell and spigot joints shall be sealed using a single turn of 6-inch (150mm) wide butyl mastic tape or heat shrink wrap/closure seal in accordance with the Commission's Material Specifications.

   (f) Insulation kits shall be used for the mechanical joints in accordance with the Commission's Material Specifications.

6.2.4 Field Applied Insulation for Pipe

1. Field Applied Insulation for Water Main or Water Service Pipe installed with less than 5-feet of cover and above grade or across bridge span(s) is typically a three

part system that includes the insulation sections, an insulation jacket, and the seals and/or bands and shall be installed as follows, unless otherwise approved by the Commission's E&TS:

2. Field Applied Insulation for above grade and below grade pipes with less than 5-feet of cover shall be supplied in accordance with the Commission's Material Specifications.

3. Field Applied Insulation for above grade pipes shall be aluminum jacketed unless otherwise approved by the Commission.

4. Field Applied Insulation for pipes with less than 5-feet of cover shall be composite cold insulation wrap (CI Wrap) unless otherwise approved by the Commission.

5. The Field Applied Insulation system shall be installed wherever the depth of water pipe has less than 5'-0" of cover and above grade or across bridge span(s).

6. The insulation sections shall be installed as follows:

   (a) Field Applied Insulation shall be applied in half sections of 3-foot lengths. The half sections are applied on an 18-inch stagger from top to bottom.

   (b) Top and bottom halves are held onto pipe using ½-inch wide filament tape wrapped one and a half times around the circumference of insulation 9-inches on center.

7. The aluminum jacketing for above grade installations shall be installed as follows:

   (a) Aluminum jacketing is applied to the insulation sections by wrapping pre-cut aluminum jacket around circumference of insulation so as to have overlap of jacket facing downward, creating a watershed and insuring water does not drain into the insulation.

   (b) Stagger the circumferential seams so they do not fall in the same place as the insulation seams. The horizontal seams shall be placed at 2-o'clock and 4-o'clock so that they do not fall in the same place as the insulation seams add shed water.

   (c) Each additional piece of jacket is then overlapped onto the proceeding pipe covering by a minimum of 2 inches.

   (d) All seams on the aluminum jacket shall be sealed with self-adhesive CI Wrap.

   (e) This jacketing is then held in place by fastening pre-cut stainless steel strapping and wing seals 12" on center, fastening with a tensioning tool. The tension shall be equally applied to each strap so as not to cause any seam separation.

8. The CI Wrap jacketing for below grade installations shall be installed as follows:

   (a) The insulation shall be free from any dust, dirt, or moisture to ensure adhesion of the CI Wrap.

   (b) CI Wrap shall be cut to length. The desired length shall allow at least a 2-inch overlap on each end. All longitudinal and circumferential overlaps shall be a minimum of 2-inches.

   (c) CI Wrap jacketing is applied to the insulation sections with a "cigarette wrap" which is wrapped longitudinally instead of spirally around the circumference of insulation so as to have overlap of jacket facing downward, creating a watershed and insuring water does not drain into the insulation.

   (d) Place the CI Wrap such that the finished overlap will allow the water to drain off the Wrap and not into the insulation. Peel back 6-inch to 12-inches of the release liner taking care not to allow any of the adhesive to touch itself. Firmly press exposed edge of sheet into place and continue removing release liner and smoothing CI Wrap. Avoid wrinkles.

   (e) Ensure complete contact at the laps and to insulation using a roller or firm pressure throughout installation. Stagger the laps of subsequent pieces.

   (f) A 4-inch Butt-Strip shall be applied at each circumferential joint with 2-inches of overlap on each side of joint.

   (g) At fittings, 4-inch CI Wrap shall be applied in a spiral wrap. All seams shall be overlapped by 50% (approximately 2-inches).

   (h) Any damaged CI Wrap may be repaired with the Commission's E&TS's approval.

   (i) Damaged CI Wrap shall be cut out and removed. A new piece of CI Wrap shall be cut with at least 2-inches of overlap on all four sides.

   (j) CI Wrap cannot be exposed to sunlight longer than 14-days.

9. Styro-board may be allowed with prior E&TS approval

   (a) Styro-board (blue), minimum R-value of 7 per inch thick, as used in normal construction of buildings, shall be placed 6 to 10 inches over the pipe with 8-inches being the preferred separation.

   (b) For each additional foot of cover required 1-inch of insulation is required with a minimum of 2 inches. For a 5-foot desired bury and the pipe at 3-feet, 2-inches of insulation would be required.

(c) For 2-inch or less copper tube water service pipe, 2-foot wide insulation board shall be used.

(d) For 6-inch or greater ductile iron water pipe, 4-foot wide insulation board shall be used.

6.2.5 Air Valve Assembly

1. Air Valve Assemblies shall be either one-inch or two-inch. The size and location required shall be determined by the Commission.
2. Tapered inlet ball type corporations, either one-inch or two-inch, with one-inch or two-inch CC thread on the inlet side and one-inch or two-inch female IP thread on the outlet side, shall be installed before the standard or one-piece air valve assembly is installed, unless otherwise approved by the Commission.
3. When tapping water mains with corporations tapping saddles shall be required.
4. The one-inch and two-inch corporations shall be tapped on top of the water main.
5. The standard air valve assembly acceptable to the Commission shall be installed as follows:

   (a) One-inch or Two-inch 90-degree elbows: shall be female on both ends with One-inch or Two-inch IP thread. Three are required with two laid vertically and horizontally before the curb stop and one laid vertically after the curb stop.

   (b) One-inch or Two-inch Ball Valve Curb Stop and Waste: shall be ball valve type with One-inch or Two-inch female IP thread on both ends. The One-inch or Two-inch Curb with a stop and waste hole shall be set on a concrete brick. The stop & waste hole shall be on the downstream side (away from water main).

   (c) One-inch and/or Two-inch Nip: shall be male on both ends with One-inch or Two-inch IP thread. Minimum length shall be six-inches and maximum length shall be twelve-inches, unless otherwise approved by the Commission.

   (d) One-inch or Two-inch Riser pipe: shall be male on both ends with One-inch or Two-inch IP thread. The length shall be from the last 90-degree elbow to four-to-six-inches below finished roadway. The riser pipe shall be set in a Valve Box top and cover and a bottom is not required.

   (e) One-inch or Two-inch cap: shall be One-inch or Two-inch female IP thread. The caps shall be installed with Teflon tape and shall be hand tightened on to the One-inch or Two-inch Riser pipe.

(f) The standard air valve assembly components shall be installed in the following order after the Tapered inlet ball type corporation: 1) Nip, 2) 90-degree elbow (vertically), 3) Nip, 4) 90-degree elbow (horizontally), 5) Nip, 6) Ball Valve Curb Stop and Waste, 7) Nip, 8) 90-degree elbow (vertically), 9) Riser pipe, and 10) cap.

(g) The air release valve shall be installed in accordance with **Air Valve Assembly Detail (W-03.0).**

(h) Boxes for Standard Air Valve Assemblies shall be installed as follows:

- Boxes for 1-inch air valves curb stops shall be the Commission's standard two-piece Buffalo style service box and shall be installed on concrete block or other Commission approved support.
- Boxes for 2-inch air valves curb stops shall be the Commission's standard two-piece gate box and shall be installed on concrete block or other Commission approved support.
- Boxes for 1-inch and 2-inch air valves brass riser pipe shall be the Commission's standard gate box top, only, and shall be set to finish grade in paved areas and set 2-inches below grade in non-paved areas.
- Install valve box and cover in accordance with **Air Valve Assembly Detail (W-03.0)**

6. One-Piece Air Valve Assembly may be used with the Commission's approval.

(a) The one-piece air valve assembly shall be installed onto the one-inch or two-inch corporations.

- The one-inch or two-inch corporations shall be brass 85-5-5-5, tapered inlet ball corporation, with one-inch or two-inch CC thread on the inlet side and one-inch or two-inch **male** IP thread on the outlet side. One is required for each assembly.

(b) The one-piece air valve assembly shall be installed vertically plumb.

(c) The air release valve shall be installed in accordance with **Air Valve Assembly Detail (W-03.1, or W-03.2)**

7. Boxes for One-Piece Air Valve Assemblies shall be installed as follows:

(a) Boxes for 1-inch air valves shall be the Commission's standard two-piece gate box and shall be installed on concrete block or other Commission approved support.

(b) Boxes for 2-inch air valves shall be the Commission's standard three-piece gate box and shall be installed on concrete block or other Commission approved support.

(c) Install valve box and cover in accordance with **Air Valve Assembly Detail (W-03.2)**

6.2.6 Air Corporation

1. Air corporations shall be one-inch and in accordance with the Commission's Material Specifications.
2. Tapered inlet ball type corporations shall be with one-inch CC thread on the inlet side and one-inch male IP thread on the outlet side and in accordance with the Commission's Material Specifications.
3. The one-inch corporations shall be tapped on top of the water main.
4. After the water main or water service pipe is in service and the air corporation is no longer needed it shall be left shut and capped with a 1-inch female IP threaded cap.

6.2.7 Ductile Iron Mechanical Joint Fittings

1. All tees, bends, crosses, and other fittings shall be ductile iron mechanical joint unless otherwise approved by the Commission.
2. All fittings shall be inspected prior to installation to ensure the gasket seats are free of excess coating. Excess coating, if present, shall be manually removed so as to ensure proper seal of gasket, however, all bare metallic surfaces created as the result of removing the excess coating shall be re-coated with similar material to prohibit corrosion.
3. All fittings shall be installed with retainer glands as in accordance with Mechanical Joint Restraint for Ductile Iron Fittings Section 6.2.21 of these Guidelines and Policies, unless otherwise approved by the Commission.
4. All fittings shall be placed, supported, and installed in strict accordance with the manufacturer's instructions and as directed by Commission.
5. All joint bolts shall be torqued using a calibrated torque wrench in accordance with the manufacturer's specifications. If manufacturer's specifications are not available tighten the bolts in accordance with Paragraph 6 of this Section.
6. Back up bends, tees, end caps, and other fittings in pipelines buried in ground with Class A concrete thrust blocks placed against undisturbed earth unless otherwise

specified. A layer of 4 mil poly shall be placed between the concrete and the fitting. The concrete thrust block shall be installed in accordance with the End of Main Details (W-04.0 or W-04.1), Tee Detail (W-05.0 – 05.1), Thrust Block Behind Fitting Detail (W-14.0), and/or Hydrant Details (W-07.0, W-07.1, or W-07.2).

7. Unless otherwise specified, all mechanical joints fittings shall be installed with restrained joints as specified in the Commission's Specifications. Grip rings will only be allowed with Commission approval.

8. Maximum cumulative (horizontal and vertical planes) deflection per joint shall not exceed the angles listed below:

Joint Size (in inches)	Deflection Angle (in degrees)
3 – 4	6.4
6	5.6
8 – 12	4.0
16	2.8
20	2.4
24	1.6

9. Any deviation in joint deflection in excess of the above stated amount must be approved by Commission.

10. The installed fittings shall be disinfected according to Disinfection Section of these Guidelines and Policies.

6.2.8 Ductile Iron Mechanical Joint Hydrant Anchoring Tees

1. Ductile iron mechanical joint hydrant anchoring tees shall be used to install all hydrants in the Commission's distribution system unless otherwise approved by the Commission.

2. Ductile iron mechanical joint hydrant anchoring tees shall be installed with retainer glands in accordance with Section 6.2.7 Mechanical Joint Restraint for

Ductile Iron Fittings of these Guidelines and Policies, unless otherwise approved by the Commission.

3. Mechanical joint gate valves shall be installed directly onto ductile iron mechanical joint hydrant anchoring tee.

4. Mechanical joint gate valves shall be installed in accordance with Section 6.2.9 Mechanical Joint Resilient Wedge Gate and Butterfly Valves of these Guidelines and Policies, unless otherwise approved by the Commission.

6.2.9 Mechanical Joint Resilient Wedge Gates and Butterfly Valves

1. All valves installed on water mains up to and including 12-inch diameter shall be resilient seat gate valves. All water mains larger than 16-inch diameter water mains may have either resilient seat gate valves or butterfly valves. Butterfly valves must be approved by the Commission.

    - Butterfly valves shall be installed with the operating nut on the short side of the street unless otherwise approved by the Commission.

2. Pressure class 250 valves are required for all installations and shall be in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

3. Typically, valves are to be located at each intersection, in each direction on street line, and approximately every 500-feet on an un-interrupted length of water main, unless otherwise approved by the Commission.

    (a) Three (3) Isolation valves shall be installed on each side of three-way intersections at each street line.

    (b) Four (4) Isolation valves shall be installed on each side of four-way intersections at each street line.

    (c) Isolation valves shall be installed every 500-feet on straight runs of water main.

    (d) Isolation valves shall be the same size as the water main being installed.

    (e) Isolation valves shall be gate valves up 12-inch in diameter. Isolation valves 16-inch and larger may be butterfly valves but require Commission approval prior to installation.

4. The valve body shall be set level such that the operator is plumb with the vertical plane which is perpendicular to the ground surface.

    (a) Typically, valves are placed on oak blocking and oak wedges are used to adjust height of valve. Wedges are placed on each side of the valve and hammered

under the valve to adjust the height. Care shall be taken not to damage the valve.

(b) When needed due to poor soil conditions concrete blocks may be required by the Commission.

1. The valve joints shall be assembled with retainer glands in accordance with Section 6.2.7 Mechanical Joint Restraint for Ductile Iron Fittings of these Guidelines and Policies, unless otherwise approved by the Commission.
2. After bolts are inserted and made finger tight, the nuts shall be tightened diametrically opposite, progressively, and uniformly around the coupling with a properly calibrated torque wrench. All bolts shall be tightened to the correct torque value using a calibrated torque wrench in accordance with the manufacturer's specifications.
3. Care shall be taken to ensure that the fusion-bonded epoxy coated exterior is not damaged. Any damaged areas shall be repaired by the Commission's Construction Crew or Installer in accordance with the manufacturer's recommendation at the sole expense of the Installer.
4. All valves shall be restrained on both sides by use of restrained joints in accordance with Tee Detail (W-05.0).
5. All valves shall be installed complete with valve box and cover. Install valve box and cover in accordance with Valve Box Detail (W-08.0).
6. The installed valves shall be disinfected according to Disinfection Section of these Guidelines and Policies.

6.2.10 Couplings

1. Pipe installations shall conform to, but not limited to, these Guidelines and Policies, and/or AWWA C219.
2. Standard range couplings, wide range couplings, and large diameter wide range couplings typically, shall be used to repair pipe that would connect new pipe to old pipe in accordance with the **Repair Pipe Detail (W-06.0)** or as otherwise approved by the Commission's Engineering and Technical Services.
3. Standard range couplings shall be installed only when connecting standard outside diameter pipe to standard outside diameter pipe in main line or service line repair.
4. Wide range couplings may be allowed only when connecting standard outside diameter pipe to oversize or pit cast pipe in main line or service line repair.

5. Two bolt wide range couplings may be allowed only when connecting standard outside diameter pipe to oversize or pit cast pipe in main line or service line repair in emergencies and in installations where clearance is an issue.
6. Clean pipe ends for distance of 12-inch each side.
7. Use soapy water or non-toxic, NSF approved gasket lubricant on pipe.
8. The installed couplings shall be disinfected according to Section 6.4.5 of these Guidelines and Policies. All cut-in pipe and fittings must be swabbed or sprayed with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness.
9. Slip follower and gasket over each pipe to distance of 6 inches from end, place middle ring on pipe end until centered over joint. Use reference marks to determine exact center location.
10. Insert other pipe end into middle ring and bring the ring to the proper position in relation to pipe laid.
11. Press gaskets and followers into middle ring flares.
12. To prevent galling nuts shall be coated, inside and out, and bolts shall be coated along the full length of threads with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer. See the Commission's Material Specifications for a full specification.
13. After bolts are inserted and made finger tight, the nuts may be tightened with an air wrench set on the lowest speed to prevent galling. The nuts shall be tightened diametrically opposite, progressively, and uniformly around the coupling. Final tightening shall be with a properly calibrated torque wrench. All coupling bolts shall be tightened to the correct torque value using a calibrated torque wrench in accordance with the manufacturer's specifications.

6.2.11 Bell Joint Clamps

1. Bell Joint Clamps designed for sealing joints on cast iron and ductile iron pipes and in accordance with the Commission's Material Specifications shall be used to seal leaking joints or as a preventative measure to help ensure joints do not leak in the future or as otherwise approved by the Commission's Engineering and Technical Services.

2. Bell joint clamps shall be installed according to the manufactures provided instructions and/or the following
3. Excavate to each joint and expose the full circumference of the joint.
4. The pipe surface adjacent to the joint shall be cleaned and the surface on the joint where the gasket will be in contact.
5. Check the pipe diameter to ensure the BJC is the proper size for the installation.
6. If applicable lubricate the gasket and wrap the gasket around the pipe. Seam of gasket should be at top of pipe.
7. Assemble the face plate or pipe half around the pipe.
8. Assemble back plate or bell ring around the back of the bell.
9. Push the assembled plates or ring together and hand tighten bolts. Make sure gasket is properly seated. Casting joints should be located at 3-o'clock and 9-o'clock.
10. Tighten bolts at joint halves first. Then tighten the bolts in 20 to 30-ft-lbs increments to the manufactures specified maximum – not to exceed 70-ft-lbs. Re-torque 15-minutes after to ensure the BJC is properly tightened.

6.2.12 Friction Clamps

1. Friction Clamps designed for restraint and in accordance with the Commission's Material Specifications shall be used to restrain pipe that would connect new pipe to old pipe in accordance with the **Installation or Cutting-In of Valve or Fitting Details (W-06.1, W-06.2, W-06.3, W-06.4, W-06.5 or W06.6)** or as otherwise approved by the Commission's Engineering and Technical Services.
2. Friction Clamps designed for restraint may be either a four-bolt socket clamp or a fabricated steel harness each used with threaded rods, nuts, and washers per the Commission's Material Specifications and in accordance with **Threaded Rod Detail (W-06.7) and Thrust Restraint to Mechanical Joint Detail (W-06.8)**.
3. Friction Clamps designed for restraint shall be installed only when restraint cannot be achieved by other means in main line or service line installation or repair.
4. Depending on the installation the number of socket clamps or fabricated steel harnesses, diameter and number of threaded rods required will vary.

   (a) 4-bolt Socket Clamps require the following number and diameter of threaded rod and shall be according to the Commission's Material Specifications:

- 6-inch – 10inch diameter pipe requires two (2) ¾-inch threaded rods
- 12-inch diameter pipe requires two (2) 1-inch threaded rods
- 16-inch diameter pipe requires four (4) 1-inch threaded rods
- Larger than 16-inch shall be approved the Commission's Engineering and Technical Services.

(b) Fabricated steel harnesses shall be provided and installed according to the Manufacturer's directions and the Commission's Material Specifications:

5. Clean the pipe surface and make sure it is free from scale and irregularities for distance of 12-inches on each side of location of friction clamp. Ensure nothing will prevent the inside of the friction clamp from attaining full contact with the pipe.

6. Using the threaded rod as a positioning guide, place the friction clamp on the pipe with the lug side or washer side positioned opposite the direction of the joint to be restrained.

   (a) Typically, the friction clamp will be installed about 2-feet to 4-feet away from fitting, valve, or coupling, unless otherwise approved by the Commission

   (b) Threaded couplings may be used to connect threaded rod when longer lengths of rod or varying lengths of rod are required for difficult installations.

7. Position the friction clamp so that a minimum of 1-inch of the restraint rod will protrude past the lug or washer when installation is complete.

8. Make sure the lugs or washers and the bent eyebolts and washers from each end of the restraint are properly aligned so that the restraint rods run straight with the pipe.

9. After clamping bolts and nuts are inserted and made finger tight, the nuts shall be tightened evenly on each side of the friction clamp with a properly calibrated torque wrench to the following values:

   (a) 4-bolt socket clamps shall be evenly tightened to the following torque amounts:

   - 5/8-inch bolts shall be tightened to 65-foot-pounds
   - ¾-inch and larger bolts shall be tightened to 75-foot-pounds.

   (b) Fabricated steel harnesses shall be tightened according to the manufacturer's recommendations.

10. Keep the spacing at the clamping pads equal between the mating friction clamp sections. Alternate between bolts until all bolts reach the recommended torque.
11. Install the restraint rods through the lugs or washers and the bent eyebolts and washers.
12. Rods shall be used in pairs.
13. Rods shall not be bent or formed.
14. Both rod nuts shall be hand tightened plus one-half revolution each.
15. Recheck clamping bolt torque on friction clamps prior to application of protective coatings and backfilling and re-tighten if necessary.
16. All components to be cut-in to an existing water main shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.27 of these Guidelines and Policies and the Commission's Material Specifications.

6.2.13 Cut-in Fittings, Valves, Hydrants, Pipes, and Repairs -General

1. All components to be cut-in to an existing water main shall be new and meet the Commission's Material Specifications.
2. When applicable the cut-in components shall be assembled and installed according to the other relevant sections of these Guidelines and Policies.
3. The Commission Construction Crew or the Installer shall excavate and expose the pipe to be cut out.
4. The Commission shall shut all valves to isolate the pipe to be cut out. The Installer must coordinate with the Commission so that customers are properly notified.
5. Whenever possible the components to be cut-in shall be pre-assembled so that the laying length can be accurately measured.
6. All the joints for each new component, where applicable, shall be restrained with retainer glands. All components shall be properly restrained either by following these Guidelines and Policies or as directed by the Commission's Engineering and Technical Services.
7. Air Corporations and/or Air Valve Assemblies shall be installed on each side of any new or replacement valve as approved by the Commission.
8. The installed couplings shall be disinfected according to Section 6.4.5 of these Guidelines and Policies. All cut-in pipe and fittings must be swabbed or sprayed

with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness.

9. All new cut-in components shall be pressure and leakage tested by filling the section of pipe according to Section 6.3 of these Guidelines and Policies and visually inspecting the new cut-in components prior to backfilling.

10. The pipes shall be properly backfilled and compacted according to Section 6.2.25 of these Guidelines and Policies.

11. The Commission's Engineering and Technical Services group would define the restraint required for the Commission's Construction Crew.

12. The Installer would have to hire an engineer to submit a design to the Commission's Engineering and Technical Services group for approval.

13. All components to be cut-in to an existing water main shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.27 of these Guidelines and Policies and the Commission's Material Specifications.

6.2.14 Install Valves and Fittings at Dead-Ends for Main Extensions

1. When cutting-in a valve onto the end of a ductile iron or cast iron water main in order to extend a water main the installation shall be in accordance with the **Install Valve or Fitting at Dead End Water Main(s) Detail (W-06.1)**, unless otherwise approved by the Commission.

2. Comply with the General requirements in Section 6.2.13;

3. Typically, at dead end water mains up to 16-inch in diameter and with less than 76-PSI static pressure, mechanical joint restraint and at least two (2) 18-foot or 20-foot pipe lengths are required after a cut-in valve. All other diameters or higher pressures require the following:

   (a) By Installer an engineer's design approved by the Commission's Engineering Technical Services.

   (b) By Commission Construction Crew a design from Engineering and Technical Services.

4. The Commission's Engineering and Technical Services group shall be contacted to determine the type and length of pipe being extended.

5. The pipe length required would be computed based on system pressure at the extension location, pipe diameter, and trench type.

6. When extending a ductile iron main the following shall be adhered to:

   (a) The Commission has determined that the existing main being extended is 18-feet or 20-feet lengths.

   (b) The cut-in valve shall be restrained with retainer glands to the end of the new and existing ductile iron water main.

7. When extending a cast iron main the following shall be adhered to:

   (a) The Commission has determined that the existing main being extended is 18-feet or 20-feet lengths.

   (b) The cut-in valve shall be restrained with retainer glands to the end of the new ductile iron water main.

   (c) The cut-in valve shall be restrained with a follower gland to the end of the existing cast iron water main.

   (d) One (1) friction clamp shall be installed on the existing cast iron pipe.

   (e) The follower gland shall be restrained to the friction clamp with ¾-inch or 1-inch, 4140-alloy steel, grade B7 threaded rods, and grade B7 fasteners and associated hardware as required.

   (f) ¾-inch or 1-inch, 4140-alloy steel, grade B7 threaded rods, and grade B7 fasteners and associated hardware shall be used. Rods are to be attached to the fittings with 90-degree bent eyebolts and to the clamps with lugs provided or cast iron or steel washers.

   (g) 10-inch diameter and smaller pipe require two (2) ¾-inch threaded rods and associated hardware.

   (h) 12-inch diameter pipe requires two (2) 1-inch threaded rods and associated hardware.

   (i) 16-inch diameter pipe requires four (4) 1-inch threaded rods and associated hardware.

   (j) All threaded rods and associated hardware shall be assembled with anti-seize lubricant applied according to the manufacturer's recommendations.

(k) All threaded rods and associated hardware shall be wrapped in a protective coating according to Section 6.2.27 of these Guidelines and Policies, prior to backfilling.

(l) All larger diameters require review and approval by the Commission's Engineering and Technical Services group.

6.2.15 Cut-In to Existing Water Mains to Replace a Valve or Fitting

1. When cutting-in a valve or fitting into existing ductile iron or cast iron water mains to replace an existing valve or fitting all the joints for each new component shall be restrained accordance with the **Cutting Into Existing Water Main to Replace Valve or Fitting Detail (W-06.2)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13, above.
3. The pipe to be cut into with a new fitting or valve shall be returned to its existing condition by the following means of joint restraint.
4. For existing cast iron pipe joint restraint using couplings and friction clamps shall be as follows:

   (a) Each end of the cut-in valve or fitting shall have a short piece of ductile iron installed and restrained with retainer glands.

   (b) The existing pipe to be cut out shall be cut so as not to be longer than a ½-inch of the assembled valve or fitting and two (2) pieces of ductile iron pipe.

   (c) Typically, two (2) coupling and two (2) friction clamps are required and shall be installed in accordance with Section 6.2.10 and Section 6.2.11 of these Guidelines and Policies.

   (d) Both couplings shall be slipped onto either the existing pipe or the new pieces.

   (e) The valve or fitting and two (2) pieces of ductile iron pipe shall be installed in place of the cut out pipe and butted up against one (1) end of the existing pipe.

   (f) The couplings shall be slipped into position so that the ends of the new pipe are in the middle of the couplings.

   (g) The friction clamps shall be installed on the existing water main.

   (h) The friction clamps shall be restrained to the new valve or fitting with stainless steel rods and associated hardware as required.

(i) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.

5. For existing ductile iron pipe joint restraint using a MJ solid sleeve shall be as follows:

   (a) One (1) end of the cut-in valve or fitting shall have a short piece of ductile iron installed and restrained with retainer glands.

   (b) The existing pipe to be cut out shall be cut so as not to be excessively longer than the assembled valve or fitting and piece of ductile iron pipe.

   (c) Typically, one MJ solid sleeve with two (2) retainer glands is required and shall be installed in accordance with Section 6.2.7 of these Guidelines and Policies and as follows:

   (d) The solid sleeve shall be slipped into position so that the ends of the new pipe are in the middle of the solid sleeve.

6.2.16 Cut-In to Existing Water Mains Install Valve with Bell Facing Valve

1. When cutting-in a valve or fitting to water mains, such as cast iron, the bell of the next pipe is found, and the bell is facing the valve or fitting to be cut-in. The installation shall be in accordance with the **Cutting into Existing Main with Bell Facing Valve Detail (W-06.3)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13;
3. The pipe to be cut into with a new fitting or valve shall be returned to its existing condition by the following means of joint restraint.
4. A short piece of ductile iron pipe shall be installed into the valve or fitting and restrained with a retainer gland.
5. For existing cast iron pipe joint restraint using a coupling, retainer gland, and a split ring clamp shall be a as follows:

   (a) A coupling shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.

   (b) An additional retainer gland shall be installed on the new short piece of ductile iron pipe.

   - This retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.

(c) One (1) split ring clamp shall be installed on the other side of the bell of the existing pipe.

(d) The additional retainer gland shall be restrained to the split ring clamp with stainless steel rods as required.

(e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.

(f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

6. For existing cast iron pipe joint restraint using a MJ solid sleeve and a split ring clamp shall be a as follows:

(a) A MJ solid sleeve shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.

(b) One (1) retainer gland and one (1) follower gland shall be installed on the solid sleeve. The retainer gland shall be installed on the new ductile iron pipe. The follower gland shall be installed on the existing cast iron or other pipe.

- The retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.

(c) One (1) split ring clamp shall be installed on the other side of the bell of the existing pipe.

(d) The follower gland shall be restrained to the split ring clamp with stainless steel rods as required.

(e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.

(f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

6.2.17 Cut-In to Existing Water Main to Install Valve with Bell Facing Away from Valve

1. When cutting-in a valve or fitting to water mains, such as cast iron, the bell of the next pipe is found, and the bell is facing away from the valve or fitting to be cut-in. The installation shall be in accordance with the **Cutting into Existing Water Mains with Bell Facing Away from Valve (W-06.4)**, unless otherwise approved by the Commission.

2. Comply with the General requirements in Section 6.2.13, above.

3. The pipe to be cut into with a new fitting or valve shall be returned to its existing condition by the following means of joint restraint.

4. A short piece of ductile iron pipe shall be installed into the valve or fitting and restrained with a retainer gland.

5. For existing cast iron pipe joint restraint using a coupling, retainer gland, and a friction clamp shall be a as follows:

   (a) A coupling shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.

   (b) An additional retainer gland shall be installed on the new short piece of ductile iron pipe.

   - This retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.

   (c) One (1) friction clamp shall be installed on the other side of the bell of the existing pipe.

   (d) The additional retainer gland shall be restrained to the friction clamp with threaded rods as required.

   (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.

   (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

6. For existing cast iron pipe joint restraint using a MJ solid sleeve and a split ring clamp shall be a as follows:

   (a) A MJ solid sleeve shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.

   (b) One (1) retainer gland and one (1) follower gland shall be installed on the solid sleeve. The retainer gland shall be installed on the new ductile iron pipe. The follower gland shall be installed on the existing cast iron or other pipe.

   - The retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.

   (c) One (1) friction clamp shall be installed on the other side of the bell of the existing pipe.

(d) The follower gland shall be restrained to the friction clamp with threaded rods as required.

(e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.

(f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

6.2.18 Cut-In to Existing Water Main to Install Valve with No Bell Found

1. When cutting-in a valve or fitting to existing water mains, such as cast iron, the bell of the next pipe is not found. The installation shall be in accordance with the **Cutting into Existing Water Main with No Bell Found (W-06.5)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13;
3. Typically, at least one (1) MJ solid sleeve is required and shall be installed in accordance with Section 6.2.7 of these Guidelines and Policies and as follows:

   (a) One (1) retainer gland and one (1) follower gland shall be installed on the solid sleeve. The retainer gland shall be installed on the ductile iron pipe. The follower gland shall be installed on the cast iron or other pipe.

   (b) One (1) concrete thrust collar and one (1) friction clamp shall be installed on the existing pipe.

   (c) The concrete thrust collar shall be installed in accordance with the **Concrete Thrust Collar Detail (W-06.6)**, unless otherwise approved by the Commission.

   (d) The follower gland shall be restrained to the friction clamp with threaded rods as required.

   (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.

   (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

   (g) The Commission's Engineering and Technical Services group would define the restraint required for the Commission's Construction Crew.

   (h) The Installer would have to hire an engineer to submit a design to the Commission's Engineering and Technical Services group for approval.

4. or as otherwise approved by the Commission's Engineering and Technical Services.

6.2.19 Tapping Sleeves and Mechanical Joint Valve

1. Ductile iron tapping sleeves shall be used when taps onto water mains are to be size on size or as required by the Commission.
2. Stainless steel tapping sleeves will be allowed when the connecting pipe is a minimum of one size smaller than the main it is connecting to or as approved by the Commission.
3. Before ordering or installing a tapping sleeve confirm with the Commission's Engineering and Technical Services what type of tapping sleeve is required for each installation.
4. The Commission will make all taps, unless otherwise approved.
5. Install both stainless steel and ductile iron tapping sleeves in strict accordance with the manufacturer's instructions.
   (a) Pressure test sleeve and valve with air at a minimum of 50 PSI prior to beginning tap.
   (b) While the sleeve is under pressure from the air test liberally spray the tapping sleeve and valve with a soapy water solution.
   (c) Make up all body bolts to torques specified by the manufacturer.
   (d) The mechanical joint outlet of the valve shall be made up in accordance with the specifications regarding mechanical joints.
6. The tapping sleeve shall be installed under pressure while flow is maintained. The tapping operation shall be conducted by workers experienced in the procedure. The tapping machine shall be furnished by the Commission's Construction Crew or Installer.
7. The tap shall be made a minimum of three (3) feet from existing joints or fittings, unless otherwise approved by the Commission. Adequate support shall be provided under the sleeve and valve during the operation. Pipe bedding material shall be properly tamped and compacted around the work.
   (a) A concrete block 4-inches thick or equal shall be placed under valves, unless otherwise approved by the Commission.

8. Provide thrust blocking at the back of the tapping sleeve in accordance with the plans. The size and location of the thrust block shall be determined based on the application.
9. Install the tapping sleeve such that the flanged face of the sleeve is plumb with the vertical plane.
10. The coupon from the valve tap shall be supplied to Commission after the tap.
11. After completing the tap, the valve shall be flushed to ensure that the valve seat is clean.
12. The installed tapping sleeve and valves shall be disinfected according to Disinfection Section of these Guidelines and Policies.
13. If authorized, cutting of the existing pipe shall be done so that the cut is square and clean, without causing damage to the pipe lining. All pipe cutting shall be done by means of an approved type of power cutter. All cut edges shall be field beveled by use of a power grinder when necessary.
14. The tapping sleeves and valves shall be installed in accordance with Ductile Iron Tapping Sleeve Detail (W-09.0) and Stainless Steel Tapping Sleeve Detail (W-09.1).

6.2.20 Valve Boxes and Covers

1. Valve boxes shall be installed concentric to the operating nut and plumb with the vertical plane.
2. The belled base section shall be placed on standard concrete blocking (typically 4-inches X 2-2/3-inches X 8-inches) in such a way that no additional loading is transferred to the valve, unless otherwise approved by the Commission.
3. Longer valve box bottoms and/or tops will be specified as required for water mains at depths that exceed the limitations of the above specified valve box.
4. Valve boxes located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified.
5. Valve boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified.
6. Valves and boxes shall be set with the stem vertical and valve box vertically centered over the operating nut.
7. The valve box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade.

8. A concrete ring shall be placed around the top of each Valve Box, flush with finished grade, if designated by the Commission's Authorized Field Representative.

9. Install valve box and cover in accordance with **Valve Box Detail (W-08.0).**

6.2.21 Mechanical Joint Restraint for Ductile Iron Fittings (Retainer Glands)

1. Retainer glands shall be installed as specified for ductile iron mechanical joint fittings.

2. Once gland is made up in accordance with paragraph 1, proceed to tighten.

3. Twist lugs until each one is in contact with the pipe before completing tightening.

4. Tighten heads in a diametric pattern until all heads have twisted off the nut.

5. Retainer glands may be used in place of follower glands on cast iron mains but under no circumstances shall retainer gland lugs be tightened and broken off when installed on cast iron mains.

6.2.22 Bolt-Thru Mechanical Joint Restraint (Foster Adapter)

1. The bolt-thru mechanical joint restraint may be used on 4-inch through 24-inch diameter joints with approval from the Commission.

2. The bolt-thru mechanical joint restraint may be used to restrain the following:

   (a) Mechanical joint valves to mechanical joint tees and crosses

   (b) Mechanical joint reducers and other mechanical joint fittings to mechanical joint tees and crosses

   (c) Mechanical joint bends and other mechanical joint fittings to each other

3. The bolt-thru mechanical joint restraint may not fit on both the "branch" and the "run" of compact tees or crosses because longer bolts are required and may obstruct each other.

4. The bolt-thru mechanical joint restraint is not recommended for direct connection to hydrant shoes due to bolt clearance issues.

6.2.23 Grip Ring Pipe Retainer

1. Grip Ring Pie Retainer shall only be allowed with Commission approval.

2. Clean pipe to remove as much dirt and corrosion as possible from the surface.

3. Slide the gland, Grip Ring, and M.J. gasket on to pipe end. Make sure the tapered side of the Grip Ring faces the gland.
4. Insert the pipe end into the M.J. fitting.
5. Slide the gasket into the M.J. bell pocket as far as possible. The gland (and Grip Ring) may be used to tap the gasket into place if required.
6. Slide the Grip Ring up the pipe until its face is against the M.J. gasket.
7. Slide the gland up the pipe until it engages the Grip Ring.
8. Install T-bolts in the M.J. fitting and gland. Tighten hand tight.
9. Using a torque wrench, tighten the nuts to 75-90 ft-lb. Care must be taken to assure that the flanges of the gland and M.J. fitting remain parallel. This can be done by alternating side-to-side while tightening. Wait 10 minutes and re-torque.

6.2.24 Fire Hydrant Installation

1. All fire hydrants are to be installed on a minimum 6-inch water main branch.
2. Hydrants shall be located approximately every 300-feet to 400-feet, on the same side of the street as the water main, on a property line, and as approved by the local Fire Department.
3. Hydrants are not to be placed at the end of the main in a cul-de-sac, but rather at or before the point of curvature (PC).
4. Public hydrants are connected directly to public water mains.
5. Public water mains are only found in street right of ways or easements given to the Commission by the property owner.
6. Private hydrants within a site shall be installed so as to protect the public water supply per DEP requirements, Commission requirements and the local Fire Department requirements. The Applicant's engineer will contact the Commission's Engineering and Technical Services for each such installation.
7. The Applicant's engineer must provide information to the Commission and local Fire Department with flow and demand requirements and available flow.
8. Private hydrants are owned, operated, and maintained by the property owner. It is encouraged to work with the Fire Department for any private hydrants to be part of the hydrant certification process.

   (a) The Commission does not maintain, repair, or replace private hydrants.

(b) Private hydrants are required to be painted red with gray bonnets and nozzle caps.

9. No other connections are allowed onto a hydrant branch unless approved by the Commission and the local Fire Department.

10. All fire hydrants shall be installed with a mechanical joint (MJ) hydrant valve attached to a mechanical joint by anchor (swivel) tee off the water main in accordance with **Hydrant Details - Standard (W-07.0).**

    (a) Hydrant valves may be mechanically restrained to a mechanical joint by mechanical joint tee off the water main in accordance with **Hydrant Details – Alternate 1 (W-07.1)**. This method requires Commission approval.

    - A short piece ductile iron pipe, at least 18-inches long shall be mechanically restrained to both the MJ X MJ tee and hydrant valve.

    (b) Hydrant valves may be mechanically restrained to a mechanical joint by mechanical joint tee off the water main in accordance with **Hydrant Details – Alternate 2 (W-07.2)**. This method requires Commission approval.

    - A bolt through mechanical joint adapter shall be mechanically restrained to both the MJ X MJ tee and hydrant valve.

11. Hydrant shall be installed vertically plumb.

12. The front body of the hydrant shall be set a minimum of 2-feet behind the curb when the sidewalk is set back from curb. If the sidewalk meets the curb the hydrant may be placed 1-foot in front of the property line or in the sidewalk if handicap access is not restricted. Placement 1-foot from the property line and all other locations shall be approved by the Commission.

13. The American Disabilities Act (ADA) requires a minimum of 36-inches of clearance around hydrants within sidewalks.

14. All hydrants must be installed with breakaway coupling located at least 2-inches above the finished grade surrounding the hydrant and not more than 6-inches above the finished grade surrounding the hydrant.

15. All hydrant bases shall be installed on a 16-inch by 8-inch by 4-inch concrete block and in ½ of a cubic yard of 1-1/2-inch crushed stone (about 2-1/2-feet by 2-1/2-feet by 2-1/2- feet) to allow for free draining of the hydrant. Make sure the drain holes of the hydrant are not blocked.

16. The installed hydrants shall be disinfected according to Section 6.4 of these Guidelines and Policies.

17. Backfill around the hydrant from the ground surface to 1-foot above the top of the hydrant shoe shall be with select common borrow.

6.2.25 Fire Hydrant Relocation

1. All fire hydrants that are relocated shall be installed according Sections 6.2.13 and 6.2.24 of these Guidelines and Policies and the following:

   (a) Hydrant branches shall be mechanically restrained with retainer glands or friction clamps and threaded rods according to Section 6.2.11 of these Guidelines and Policies, unless otherwise approved by the Commission.

   (b) Intentionally left blank for future use

6.2.26 Fire Hydrants Replacement

1. All fire hydrants that are relocated shall be installed according Sections 6.2.13 and 6.2.24 of these Guidelines and Policies and the following:

   (a) Hydrant branches shall be mechanically restrained with retainer glands or friction clamps and threaded rods according to Section 6.2.11 of these Guidelines and Policies, unless otherwise approved by the Commission.

   (b) Intentionally left blank for future use

6.2.27 Fire Hydrant Operations

1. All hydrants shall be operated by Springfield Water and Sewer Commission employees or Springfield Fire Department. During Fire Flow Testing the Applicants personnel may operate a hydrant in accordance with this Section and Section 6.5 of the Guidelines and Policies.
2. Open the hydrant inspection program on the field computer and document hydrant asset information.
3. Visually inspect hydrant barrel and each section of hydrant using the hydrant inspection log as a guide; look for cracks on upper barrel, check the bottom, middle, top, front, back and both sides of hydrant. Also check nozzle caps, nozzle locks and threads. Remove caps and check threads. If threads are worn out and/or damaged, make note to have them replaced.
4. Visually inspect all bolts where upper and lower barrels are connected. If necessary, have any defective bolts replaced. For breakaway couplings, check for cracks and worn bolts or to see if the coupling is loose. Manually pull and push hydrant to check that it is secure. The Hydrant should not move.

5. Remove one cap, set up spigot with ball valve on nozzle and slowly flow hydrant to prevent water quality issues. Allow hydrant to flow until clear. Open and close hydrant valve to check for smooth easy operation.

6. Perform maintenance on all parts including grease caps and Zerk fittings, gaskets, etc.

7. If the hydrant requires additional work outside the scope of this inspection, check with the working foreman to assign additional work orders to the hydrant. In some cases, repair duties may be performed on the spot or submitted to other crews. The following are examples requiring follow up work orders:

8. Intentionally left blank for future use

6.2.28 Protective Coatings

1. Protective Primer

   (a) Wire brush and scrape the surface clean.

   (b) Apply protective primer by brush, rag, or hand (glove). A thin film of primer to a minimum thickness of 2 mils (.002-inch) will be sufficient.

   (c) On wet, cold or rusty surfaces, rub and press Protective Primer firmly onto these areas, displacing moisture and ensuring adhesion to the surface.

   (d) After application of the primer, Protective Coating Tape shall be applied immediately.

2. Protective Coating Tape

   (a) After application of the primer, Protective Coating Tape shall be applied immediately.

   (b) Protective Coating Tape shall be spirally wrapped around the fitting, valve, or other appurtenance and hand molded to conform to the shape of the surfaces being coated.

   (c) Protective Coating Tape shall be overlapped no less than 1-inch. When wet or other corrosive conditions exist, the overlap shall be 50% of the width.

   (d) While wrapping all air shall be pressed out of the tape by hand and a smooth seam shall be made.

   (e) After application of the Protective Coating Tape, Protective Coating Outer Wrap shall be applied immediately.

3. Protective Coating Outer Wrap

   (a) After application of the Protective Coating Tape, Protective Coating Outer Wrap shall be applied immediately.

   (b) Protective Coating Outer Wrap shall be spirally wrapped around the fitting, valve, or other appurtenance and hand molded with sufficient tension to conform to the shape of the surfaces being coated.

6.2.29 Backfill

1. Bank-run, Screened, and Structural Gravel Aggregate

   (a) The gravel aggregate shall be spread in layers of uniform thickness not exceeding 12-inch before compaction and moistened or allowed to dry as directed.

   (b) The gravel aggregate shall be thoroughly compacted by means of suitable power driven tampers or other power driven equipment.

   (c) Backfill shall be graded with the placement of suitable soil material, as determined by the Commission Representative, in 12-inch (maximum) layers compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.

2. Sand

   (a) The sand shall be spread in layers of uniform thickness not exceeding 8-inch before compaction and moistened or left in natural state as directed.

   (b) The sand shall be thoroughly compacted by means of suitable power driven tampers or other power driven compaction equipment.

3. Common Borrow/Fill and Select Common Borrow/Fill

   (a) The common borrow and select common borrow fill shall be spread in layers of uniform thickness not exceeding12-inch before compaction and moistened or allowed to dry as directed.

   (b) The common borrow and select common borrow fill shall be graded with the placement of material, as determined by the Commission Representative.

   (c) The common borrow gravel shall be thoroughly compacted by means of suitable power driven tampers or other power driven equipment.

(d) The common borrow and select common borrow fill shall be compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.

4. Excavatable Flowable Fill

(a) The Commission's Authorized Field Representative shall approve all fill procedures prior to placing excavatable flowable fill.

(b) All pipes, bends, fittings, and other appurtenances shall be secured prior to the delivery of the excavatable flowable fill.

(c) A piece of 4-mil poly minimum shall be placed between all pipes, bends, fittings, and other appurtenances and excavatable flowable fill.

(d) When possible excavatable flowable fill shall be placed on a bed of compacted gravel fill.

(e) Excavatable flowable fill shall be furnished and placed in a fluid condition on the secured pipes, bends, fittings, and other appurtenances.

(f) Excavatable flowable fill exposed surfaces shall be protected from premature drying, wash by rain or running water, wind, mechanical injury, and excessive hot or cold temperature.

5. Non-Excavatable Flowable Fill

(a) The Commission's Authorized Field Representative shall approve all fill procedures prior to placing non-excavatable flowable fill.

(b) All pipes, bends, fittings, and other appurtenances shall be secured prior to the delivery of the non-excavatable flowable fill.

(c) A piece of 4-mil poly shall be placed between all pipes, bends, fittings, and other appurtenances and non-excavatable flowable fill.

(d) When possible non-excavatable flowable fill shall be placed on a bed of compacted gravel fill.

(e) Non-excavatable flowable fill shall be furnished and placed in a fluid condition on the secured pipes, bends, fittings, and other appurtenances.

(f) Non-excavatable flowable fill exposed surfaces shall be protected from premature drying, wash by rain or running water, wind, mechanical injury, and excessive hot or cold temperature.

6. Concrete for Fill

   (a) The Commission's Authorized Field Representative shall approve all fill procedures prior to placing concrete for fill.

   (b) All pipes, bends, fittings, and other appurtenances shall be secured prior to the delivery of the concrete for fill.

   (c) A piece of 4-mil minimum poly shall be placed between all pipes, bends, fittings, and other appurtenances and concrete fill.

   (d) When possible concrete for fill shall be placed on a bed of compacted gravel fill.

   (e) Concrete for fill shall be furnished and placed in a fluid condition on the secured pipes, bends, fittings, and other appurtenances.

   (f) Concrete for fill, exposed surfaces, shall be protected from premature drying, wash by rain or running water, wind, mechanical injury, and excessive hot or cold temperature.

Section 6.3 Temporary Bypass Mains

6.3.1 General

1. Furnish all labor, materials, equipment and incidentals required to install and remove by-pass and temporary water pipe and fire hydrants of the sizes required to provide adequate service to all water consumers whose service will be interrupted by new water main installation and to fulfill fire service requirements.

2. The Commission's Construction Crew or Installer shall provide temporary water service to one and two family residences and to other water customers with small diameter services currently connected to mains to be shut off, in order to facilitate the work, by means of temporary hose connections.

3. The Commission's Construction Crew or Installer shall furnish all work and fittings and make all necessary connections required to supply the bypass pipes (including service) with water from hydrants or existing water mains. Procedures for connecting bypass pipes to existing water mains that are to remain in service are specified elsewhere in this section.

4. Typically, temporary water pipe is not allowed to be installed and/or in service from November 15 to April 15 to prevent freezing of water supply to Commission customers, unless otherwise approved by Engineering and Technical Services

(E&TS). The Commission's Construction Crew or Installer may submit a plan to E&TS as defined in Section 6.3.2 that includes freeze protection.

6.3.2 Installation

1. Temporary water pipe shall not be installed without the prior approval of Engineering and Technical Services (E&TS).

2. E&TS may prepare or shall approve a bypass plan and sequence of work as indicated below:

   (a) The plan shall be drawn on a clean set of project drawings or GIS plans. A sequence of work will be defined in a memo to the Commission's Construction Crew.

   - The plan shall address how pipe will be laid at catch basins, address how pipe will cross intersections, address how pipe will be laid at intersections to avoid contact with cars cutting turns sharply, provide the make and model of all valves to be utilized, provide the type of temporary water piping to be utilized, brass sampling tap locations and address pedestrian safety issues such as but not limited to the, American with Disabilities Act (ADA) compliance, and include a disinfection procedure as described herein.
   - The plan for temporary water pipe layout shall include 4-inch temporary water pipe on one side of the route and 2-inch temporary water pipe on the other side of the route.
   - If freeze protection is being proposed it shall include a minimum coverage of 3-feet of earth with a 6-inch straw layer over the earth over the pipe or other means to be approved by E&TS. No running water will be allowed as a means of freeze protection.

   (b) The plan by the Installer shall be drawn on a clean set of project drawings or other approved plans and include the bullet points in paragraph (a) above. A sequence of work will be defined in a memo to E&TS.

3. The bypass pipes shall be supplied from connections made to hydrants or existing water mains that are to remain in service as specified elsewhere in this section. Each bypass piping section shall have a minimum of two (2) connections, unless otherwise approved by E&TS.

4. Temporary water pipe typically is laid in gutters, but during road reconstruction may be moved to back of walk.

   (a) At street intersections, a straight line shall be cut in the existing bituminous paving and the temporary water pipe shall be laid in a shallow trench covered with temporary surfacing.

(b) At driveways, pipe crossings may either be provided by cold patch cover, a straight line shall be cut in the existing bituminous paving and the temporary water pipe shall be laid in a shallow trench covered with temporary surfacing or other approved method.

(c) At sidewalks, pipe crossings may either be provided by cold patch cover, a straight line shall be cut in the existing bituminous paving and the temporary water pipe shall be laid in a shallow trench covered with temporary surfacing or other approved method. ADA compliance shall be enforced.

5. Minimum ADA accessibility requires the following:

   (a) Typically, a 48-inch minimum width is required for new or temporary installations,

   (b) Curb ramps shall be firm, stable, and have a non-slip surface. Curb ramps should not warp or buckle and should be made of materials strong enough to support the weight of pedestrians as well as motorized scooters and wheelchairs. Ramps should also be color contrasting and contain marked edges, so they are noticeable by pedestrians who have visual impairments. Furthermore, ramps should also have free draining surfaces with a maximum cross slope of 2 percent. Note that the cross slope for midblock crosswalks can match the running slope of the roadway up to a maximum of 5 percent,

   (c) Curb ramp slope shall have a slope of 1:12 maximum for a rise of 6 inches,

   (d) Curb ramp slope shall have a slope of 1:8 maximum for a rise of 3 inches,

   (e) A slope steeper than 1:8 is not allowed, and

   (f) When a ramp is installed parallel to the curb, a 48 inch by 48 inch platform should be provided at curb level to allow pedestrians to turn 90 degrees before descending the ramp.

6. At E&TS's discretion, hose may be allowed to come around bends, to cross driveways, to connect temporary water mains to existing hydrants, or to connect temporary water mains to existing water services. All hose shall comply with NSF 61 standards. No kinks, excessive bends, or other restrictions shall be allowed to any hose used on the temporary water pipe, temporary hydrants, or temporary water services.

7. Sanitary precautions shall be satisfactory to E&TS and shall meet all requirements of the public health authorities having jurisdiction. The installation shall be watertight. Care shall be exercised throughout to avoid any possible pollution of mains, house services, or the temporary water pipe. The interior of temporary

water pipe, temporary hoses and any other connection pipe to convey water for potable use shall be flushed and disinfected prior to its use in accordance with AWWA C651 and in accordance with Section 6.4 of these Guidelines and Policies

8. All temporary pipes shall have valves installed that meet the approval of E&TS. A valve shall be provided at each hydrant connection and each tap hole connection. Main line valves shall be located no further than 500-feett apart when directed by the E&TS. Handles shall be removed from temporary hydrants. Main line temporary valves may require the handles be removed at the discretion of the SWSC.

9. Sample taps shall be furnished and installed on temporary water pipe in accordance with of these Guidelines and Policies.

10. Whether it is being installed, in service, or being removed, the amount of temporary water pipe kept on the job shall be the minimum that will allow the work to continue at a reasonable rate.

11. The Commission Construction Crew or Installer shall maintain the temporary water pipe during all emergencies on a 24 hour basis. The Installer shall provide the SWSC the name and phone number of their 24 hour emergency contact person. The 24 hour emergency contact person shall be located within 30 minutes traveling distance from the project site. The Installer's emergency staff shall have vehicles, equipment, tools, and parts to maintain the temporary water pipe if it is broken or out of service for any reason.

6.3.3 Temporary Connection to Existing Mains

1. At some locations, as directed or approved by the SWSC, it may be necessary to tap the existing water mains in order to supply the temporary water piping with water service.

2. The normal connection to an existing water main shall consist of a single 4-inch tap, with one (1) 4-inch hose feeding into a 4-inch temporary bypass pipe. A 4-inch valve shall be provided on the temporary water pipe near the taps.

3. An alternative connection to an existing water main may be allowed but requires approval E&TS and shall consist of a double 2-inch tap, with two 2-inch lines feeding into a 4-inch temporary bypass pipe. A 4-inch valve shall be provided on the temporary bypass pipe near the taps.

4. At locations, as approved or directed by E&TS, where connections for temporary water piping are to be made underground to the existing water mains with corporation stops or wet taps, the Commission Construction Crew or Installer shall make the necessary excavations at the locations and to the limits as necessary to

uncover the existing underground water lines and permit the installation of corporations stops or wet taps thereto. The Commission Construction Crew or Installer shall furnish and install a shutoff valve at the connection to the existing water line; connect the temporary water piping to the shutoff valve and, where directed by E&TS, backfill the excavation and install temporary bituminous pavement. When the need for the temporary water service has ceased, the Commission Construction Crew or Installer shall re-excavate, where necessary cap the corporation stop or wet tap; disconnect and remove the water piping, shutoff valve, backfill the excavations; and provide the gravel base course and temporary and permanent pavements over the excavated and disturbed areas in accordance with the requirements specified and as directed.

6.3.4 Temporary Fire Hydrants

1. Where fire hydrants are by-passed, the Commission Construction Crew or Installer shall furnish, install, maintain and remove temporary hydrants. The temporary hydrant shall be placed within 25 feet and on the same side of the street as the hydrant to be out of service, unless otherwise directed by E&TS. Each temporary hydrant shall be installed on a 4-inch bypass line, and shall consist of a 4-inch branch, 4-inch valve, two (2) 90-degre bends (installed vertically), one 45-degree bend (installed vertically down) and 4-1/2-inch National Standard Thread (NST) nozzle or a 4-inch by 2-1/2-inch tee and two 2.5-inch nozzles, if approved by E&TS, for fire hose attachment. Nozzles shall be threaded for cap and grooved for fire hose attachment, using National Standard Thread.

2. Temporary hydrants shall be staked to the ground with a 1-inch diameter steel rebar approximately 4-feet long. The rebar shall driven into the ground a minimum of 2-feet. The temporary hydrant shall be clamped to the remaining rebar with at least two (2) steel hose clamps. Blocking shall be provided to raise hydrants above curbs when required.

3. Temporary hydrants shall meet the approval of the SWSC and the Fire Department. They shall be set in such a manner that the Fire Department will have no difficulty making a connection with a fire hose, where they will cause the least obstruction to vehicular and pedestrian traffic, and where they will be least likely to be damaged. Before permanently shutting off the water main that is to be replaced, the Commission Construction Crew or Installer shall test all temporary hydrants and valves to be sure that they are in proper working order.

4. The same type of temporary hydrant shall be utilized throughout the project.

5. Once put into use, the temporary hydrants shall be maintained by the Commission Construction Crew or Installer until the existing hydrants and or new hydrants are restored to service.

6. Any existing hydrants that are out of service shall be "bagged" by the Commission Construction Crew or Installer and reported to the Fire Department as being out of service.

6.3.5 Temporary Water Service to Buildings

1. Temporary water service connections shall be made to the temporary water pipe with a tap of the appropriate size.

2. Temporary water service connections shall be made to sill cocks outside the buildings or to temporary connections at the meter inside the buildings, as may be required or directed.

3. The temporary hoses shall generally be laid up the side of driveways and shall be as inconspicuous as possible for their entire length.

4. In cases where access to the building water meter is not possible or where temporary service connection using hoses would not provide adequate supply capacity a temporary service connection shall be made to the existing service pipe in the street between the corporation cock at the main and the curb stop, or in the sidewalk area between the curb stop and the service shut off valves inside the building.

5. The Commission Construction Crew or Installer with the SWSC present shall connect each home to be out of service during water main replacement to the 2-inch or 4-inch temporary water piping after approval of the temporary piping for service by SWSC.

6. Commission Construction Crew or Installer shall flush and disinfect each individual temporary water service per SWSC's Guidelines and Policies (separately bound).

6.3.6 Temporary Bypass System Sequence and Requirements

1. Commission Construction Crew or Installer shall connect onto the 4-1/2-inch pumper connections on existing and new hydrants at locations shown on the bypass plan.

2. Commission Construction Crew or Installer shall install temporary hydrants after each connection to new hydrants or existing hydrant used as part of the temporary bypass system.

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3. Commission Construction Crew or Installer shall install a 4-inch valve after each temporary hydrant.

4. Commission Construction Crew or Installer shall install temporary bypass piping, valves and fittings at the locations shown on the Contract Drawings and in accordance with the Contract Documents.

5. Commission Construction Crew or Installer shall bury 2-inch temporary water piping and any temporary building service piping at all road crossings in a trench at least 12-inches deep and in a 4-inch sleeve or method as approved by Engineer.

6. Commission Construction Crew or Installer may utilize asphalt ramps for 2-inch by-pass at driveways but shall bury 2-inch by-pass if deemed necessary by the SWSC at driveways to allow the homeowner to enter and leave the driveway without damaging vehicle or by-pass piping.

7. Commission Construction Crew or Installer shall bury 4-inch by-pass at all road crossings in a trench at least 12-inches deep and in a 6-inch sleeve or other method as approved method by the Engineer.

8. Commission Construction Crew or Installer shall bury 4-inch by-pass at all driveways as required to allow the homeowner to enter and leave the driveway without damaging vehicle or by-pass piping.

9. Commission Construction Crew or Installer shall provide a minimum 2-inch valves and/or taps as required to flush the temporary bypass piping, unless otherwise approved by E&TS.

10. Commission Construction Crew or Installer shall flush and disinfect entire by-pass system before connecting individual water in accordance with Section 6.4 of these Guidelines and Policies.

11. Commission Construction Crew or Installer shall provide all material (including, but not limited to pipe, valves, and fittings), labor, and equipment to perform above.

12. SWSC to provide bacteria sampling service.

13. The Commission Construction Crew or Installer shall connect, flush, and disinfect each individual temporary water service to each home to be out of service as described above.

14. The Commission Construction Crew or Installer shall maintain temporary water piping at all time. The Commission Construction Crew or Installer shall provide to the SWSC, the local DPW, local police department, and the local fire

department a 24-hour contact person with cell phone number that can be available within 60-minutes of a pipe break or other safety issue.

15. Upon completion of the new replacement water main and services, the Commission Construction Crew or Installer shall remove all temporary water piping and restore site to original condition.

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Section 6.4 Filling, Leakage testing, Disinfection, and Bacteria Testing of Water Mains

6.4.1 General

All water mains and temporary water mains before being put into service shall be filled and leak tested in accordance with the latest version of AWWA standard C-600, and flushed, disinfected, and bacteria tested in accordance with the latest version of AWWA standard C-651 and the following:

6.4.2 Filling of Pipe:

1. The new main or repaired main must always be separated from the active water system until the Filling, Pressure and Leak Test, Flushing, Disinfecting, and Testing is completed and approved.
2. The supply main, to which the new or repaired mains will obtain its fill water, will be flushed for 15 minutes prior to filling under the direction and upon approval of the Commission.
3. The fill water shall come from a potable source in one direction at a slow rate equivalent to a valve cracked open. In any event the maximum number of turns on any valve shall be five (5) ½-turns.
4. The pipe that is to be filled with water shall have all air expelled from the water main through hydrants, air valve assemblies located at the high points, services and blow-offs, located at the end of water mains. If temporary air corporations are installed by Commission's Construction Crew or Installer, they shall be capped with a threaded brass cap upon the successful completion of the pressure test.
5. All temporary air corporations used for flushing shall have a Commission style flushing device temporarily installed on it according to the Flushing Section of these Guidelines and Policies.
6. Once the new main or repaired main is filled with water see the Pressure and Leakage Section of this document.
7. Once the new main or repaired main passes the pressure and leakage tests see the Disinfection Section of this document.
8. Once disinfection has been achieved, see the Flushing Section of this document.

6.4.3 Pressure and Leakage Testing

1. All water mains and fire services shall be subjected to pressure and leakage testing in accordance with the latest version of AWWA standard C-600. Allowable

leakage for each section of water main tested shall be compared against the table attached at the end of this section in order to determine the acceptability of the test.

2. At a minimum the leak test shall be for two (2) hours at either 150-PSI or 1-1/2 times the working or static pressure, whichever is greater.

3. The Owner, Owner's authorized representative, the Commission Approved Contractor, or the Commission's designee shall hire a testing company who is acceptable to Commission to complete the required pressure and leakage test. The tester shall submit certified leakage testing results in writing to Commission for each section of main tested. The tester shall be approved by Commission prior to initiating the pressure test. Commission shall be notified a minimum of 24 hours in advance prior to any pressure and leakage testing. **Pressure and leakage testing must be completed in the presence of a Commission Authorized Field Representative unless otherwise arranged.**

4. If a section of main fails pressure and leakage testing, the Commission's Construction Crew or Installer shall locate, uncover, and repair or replace the defective section of pipe, fitting, valve or joint at no additional expense to Commission. The Commission's Construction Crew's or Installer's tester shall then conduct additional pressure and leakage testing until satisfactory test results are achieved.

5. Table for Allowable Leakage per 1000 ft. of Pipeline in gallons per hour*

Average Test Pressure (in PSI)	NOMINAL PIPE DIAMETER (in inches)																
	3	4	6	8	10	12	14	16	18	24	30	36	42	48	54	60	64
450	0.48	0.64	0.96	1.27	1.59	1.91	2.23	2.55	2.87	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.70	3.38	4.05	4.73	5.41	6.08	6.76	7.21
200	0.32	0.42	0.64	0.85	1.06	1.27	1.49	1.70	1.91	2.55	3.19	3.82	4.46	5.10	5.73	6.37	6.80
175	0.30	0.40	0.60	0.79	0.99	1.19	1.39	1.59	1.79	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80

* If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

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6.4.4 Flushing

1. The Commission's Construction Crew or Installer shall conduct flushing operations using methods and procedures conforming to AWWA C651.
2. The Commission's Construction Crew or Installer shall flush the water main under the direction of Commission's Authorized Field Representative.
3. The Commission's Construction Crew or Installer shall notify all customers affected by the flushing 24-hours in advance of any flushing operation.
4. Flushing may be required during the late evening hours if it is determined that flushing will result in off colored water to the Commission's existing customers.
5. All flushing must be done using fire hydrants, air valve assemblies, Air Corporation, or end caps through a Commission approved flushing device.
6. The flushing device should be made up in accordance with the **Flushing Device Detail (W-10),** unless another method to flush the water main or water service is approved by the Commission. Flushing devices may be provided by the Installer or rented from the Commission beginning July 1, 2008, at rates as set forth in the Commission's Rules and Regulations.
7. The flushing device shall be made up of the following components:

   (a) The flushing devices shall be either 1-inch or 2-inch, whichever is required by the Commission.

   (b) All components shall be brass and/or k-type copper.

   (c) All threaded joints shall be assembled with Teflon tape sealant.

   (d) The flushing device shall have a copper tube or brass riser/connector from the fire hydrant, air valve assembly, air-corporation, or end cap. The riser shall be 1-inch or 2-inch diameter.

   (e) The riser shall connect to the brass tee with a brass copper tube service quick joint inlet by male iron pipe thread outlet. The tee shall be 1-inch or 2-inch diameter.

   (f) One side of the tee shall be bushed down to ¾-inch with a brass bushing. This side of the tee shall be used for water quality sampling.

   (g) A ¾-inch nip shall be used to connect a ¾-inch by ½-inch brass reducer.

   (h) A ½-inch, chrome plated, and without threads brass globe spigot, shall be installed onto the reducer. Be sure the spigot is always pointing down.

(i) On the other side of the tee, which shall be used for flushing, it shall be either bushed down to ¾-inch or left at 2-inches.

(j) A ¾-inch or 2-inch brass ball valve shall be installed onto the ¾-inch bushing or 2-inch brass nip.

(k) A ¾-inch or 2-inch brass nip shall be installed onto the ¾-inch or 2-inch brass ball valve.

(l) A ¾-inch brass vacuum breaker with hose thread shall be installed onto the ¾-inch brass nip or a 2-inch Commission approved check valve shall be installed onto the 2-inch nip.

- A check valve may be installed in place of the vacuum breaker.

(m) Proper support of the flushing device shall be provided.

8. Water that is flushed to the street or sewer must be collected in a controlled manner and not find access to nearby natural waterways. Hoses hooked up to hydrants to facilitate flushing and the control of drainage shall not be submerged or laid flat on the ground but must be air gapped at the discharge end.

9. The following is the approved procedure for flushing pipe.

(a) The discharge hose shall be equivalent in diameter or greater to the discharge opening.

(b) The allowed flushing time in minutes for 500 feet of up to 8-inch pipe using a fire hydrant (preferred) or end cap with 2-inch or larger opening shall be as follows:

- All flushing must follow flushing time requirements.
- A wide-open flush (greater than to 250 gallons per minute) shall be a minimum of 15 minutes (a diffuser must be in place prior to beginning the flush).
- A low flow flush (up to 250 gallons per minute) shall be a minimum of 30 minutes (a diffuser must be in place prior to beginning the flush).
- Flushing may not extend for longer periods of time unchecked.
- Contact the Water Quality Manager or the Commission's Engineering and Technical Services for assistance with flushing time requirements.

(c) After each period of flushing, a decision must be made to stop or continue for another designated period.

(d) Disposal of water from the flushing of new mains must be pre-approved by the Commission.

- All newly installed hydrants shall also be flushed at this time.
- In most instances, a discharge of chlorinated water into a sewer main is acceptable provided a sewer manhole is available. If a catch basin, that is part of the Combined System, is available discharge of chlorinated water may be allowed.
- The sewer inlets or allowed catch basins to which the chlorinated water will be flushed must be identified and pre-approved for use.
- If a sewer main is not available, then de-chlorination of the discharge of chlorinated water must be in accordance with AWWA standard C651 prior to discharge.

10. By Commission's Construction Crew:

(a) A Commission owned water meter and back flow preventer shall be installed on the fire hydrants, air valve assemblies, air corps, or end caps.

(b) The begin reading and end reading shall be recorded and submitted to the Customer Service office of the Commission.

11. By Installer:

(a) An Installer owned water meter or Commission owned that is rented from the Commission by the Installer, that reads in gallons and back flow preventer shall be installed on the fire hydrants, air valve assemblies, air corps, or end caps.

(b) The begin reading and end reading shall be recorded and submitted to the Customer Service office of the Commission.

12. When flushing and scouring the pipe of debris, in the event the main became contaminated, cannot be done from a hydrant or any smaller hookup. Flushing to remove contamination must involve installing a blow-off at least 2/3 the size of the pipe being flushed.

13. All residual from the flushing must be cleaned up after the flushing process is complete.

6.4.5 Disinfection – General:

1. The Commission's Construction Crew or Installer shall conduct disinfection operations using methods and procedures conforming to AWWA Standard C651.

2. Methods for the disinfection of pipe must be pre-approved by the Commission.

   (a) The continuous feed method shall be used to disinfect new water main installations.

   (b) The tablet method may be allowed to disinfect new water mains but shall be approved by the Commission.

   (c) The slug method may be allowed to disinfect new water mains but shall be approved by the Commission.

   (d) The swab method shall be used to disinfect repairs, replacement of valves, fittings, and/or hydrants.

   (e) Any other method to disinfect new or repaired/replaced water mains shall be submitted to the Commission for review and approval prior to being used.

3. A free chlorine residual of at least 25-mg/L (ppm) must be established throughout the newly installed main prior to waiting 24-hours. The free chlorine residual of at least 25-mg/l (ppm) must be maintained for at least 24 hours.

4. Generally, flushing and sampling locations are located at the end of new main installations.

   - At least one sampling location should be at the beginning of the new installation.
   - Any new tie in longer than one pipe length requires at least one sampling location at the end of the new tie in.
   - Every 500-feet of the new main installation requires a least one sampling location.

5. Failure of the newly constructed main to meet the Commission's requirements for cleanliness and water quality could require flushing of the system, disinfection of the system, removal of system components, or other action as deemed necessary by the Commission to guarantee the protection of the existing drinking water system.

6. All costs associated with filling, pressure and leakage testing, flushing, and disinfecting the water main shall be borne by the Installer.

6.4.6 Disinfection – Continuous Feed Method:

7. This procedure for disinfection requires that the below amount of water be chlorinated outside the new water main, such as in a water truck, and then pumped into the main to displace the existing water in the main.

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Gallons of Chlorine Water Required to Fill 100 Feet of Pipe With 25 ppm of Chlorine According to Diameter of Pipe			
		Add the following amount of chlorine to the water:	
Pipe Diameter (Inches)	Water in Pipe (Gallons)	5%Chlorine Solution	1%Chlorine Solution
6	150	1 cup	1-½ quarts
8	260	1 pint	2-½ quarts
12	590	1-½ quarts	1-½ gallons
16	920	2 quarts	2-½ gallons

8. Making Chlorine Solutions:

   (a) With HTH Granular Calcium Hypochlorite: add 1 pound of calcium hypochlorite to every 8-gallons of water to make a 1% solution.

   (b) With liquid Sodium Hypochlorite: dilute according to the percent available chlorine on the container.

   (c) For example, a 20% available chlorine solution would require 1 gallon in 19 gallons of water to get a 1% chlorine solution.

9. The chlorine water is fed in through a corporation near the valve for the supply.

10. The valve(s) connecting the new pipe to the existing system must be closed completely.

11. At the other end of the main, or at several ends, water is flushed at a low rate to allow the existing water to be displaced with the chlorine water.

12. It is good practice to test for chlorine at these flushing points to confirm that highly chlorinated water has made it through to all ends before the main is shut down.

13. This chlorinated water will then be allowed to sit inside the main for at least 24 hours before it is flushed out according to the Flushing section of this document.

14. Testing at the sampling location at the end of the main will be done until the flushed water contains at least 25 mg/L of chlorine (which could require increasing the injection rate of chlorine).

15. Once the proper amount of chlorine is produced all other sampling locations that were installed for the sanitary release must be flushed until chlorine is also

detected at these points (flush one point at a time while maintaining chlorine injection).

16. When all sampling points have a proper level of chlorine, the main is shut down and the chlorine injection stopped.

17. This chlorinated water will then be allowed to sit inside the main for at least 24 hours before it is flushed out according to the Flushing section of this document.

6.4.7 Disinfection – Tablet Method

1. This procedure for disinfection is the application to each pipe length (see table) of an approved calcium hypochlorite tablet(s) using approved adhesives. The Commission approves the use of 5-7-gram calcium hypochlorite tablets (approximately 65% available chlorine by weight or 3.25-4.55 grams of available chlorine per tablet). These tablets shall be affixed using approved adhesive (Permatex Form A-Gasket No. 2 or Permatex Clear RTV Silicone Adhesive Sealant) to the top of each pipe length, internally. Marking of the pipe externally is a good practice to identify the locations of the tablets so that the pipe is installed correctly.

2. One chlorine tablet shall be placed in each fire hydrant branch.

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3. Minimum Number of Tablets for Each Pipe Length (18-20 feet) to obtain a 25 mg/L dose of Chlorine shall be as follows:

Pipe Diameter (in inches)	Number of Tablets per Pipe Length (in inches)
6	1
8	2
10	3
12	4
16	6
24	8

4. All tie-in pipe and fittings must be swabbed or sprayed with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness.

5. Free Chlorine Residual Sampling Procedure:

   (a) The Commission's Authorized Field Representative shall take an, initial free chlorine residual test immediately following the filling procedure or the tablet disinfection procedure. The initial free chlorine residual shall exceed 25 mg/L (Parts per Million (PPM)) at this time.

   (b) The chlorinated water shall set in the main for 24 hours.

   (c) At the end of the 24-hour period, a free chlorine residual shall be taken by the Commission's Authorized Field Representative from the main and it must exceed 10 mg/L (PPM) of free chlorine residual.

   (d) If sufficient free chlorine is detected by the Commission's Authorized Field Representative, then the main will be considered ready for bacteria testing because the chlorine demand has been met.

   (e) The chlorinated water shall be flushed from the main upon completion of the chlorination process and a bacteriological sample shall be taken from the main once the chlorine residual of the water being discharged from the main has dropped below 1.5 PPM.

   (f) If sufficient free chlorine is not detected by the Commission's Authorized Field Representative, then the main will be considered to have failed without testing. Re-chlorination shall be required.

6. After the flushing and disinfection of the new main, the water in the new main must sit without movement for at least 24 hours and there must result no negative impact on the water's quality as tested and determined by the Commission.

7. The Commission's Construction Crew or Installer must provide approved sampling access to the new main for the testing of the water. New mains exceeding 500 feet or tie-ins exceeding 50 feet in length must have multiple sampling locations.

8. Re-chlorination or additional disinfection requires the following the procedures set forth in the Disinfection – Chlorinated Water Supply Section of this document.

9. After the new main has been approved, the water main shall be flushed by approved means before installing the service connections. Refer to the procedures as set forth in Flushing Section of this document.

10. If the water main has been approved but has not been put into service for more than one week then the main shall be flushed weekly using approved means. Refer to the procedures as set forth in Flushing Section of this document.

6.4.8 Disinfection – Swab method

1. This procedure for disinfection is used when existing mains are dewatered and cut open for a repair.

2. If the trench cannot be dewatered, then liberal quantities of 1% solution of water and sodium hypochlorite (bleach) shall be applied to the trench areas.

3. The existing pipe shall be cleaned and swabbed or sprayed with bleach prior to the repair piece being put into place.

4. The repair piece and repair couplings shall be cleaned and swabbed or sprayed with bleach prior to the repair piece being put into place.

5. The Commission's Construction Crew or Installer shall flush the main as described in this section and/or until discolored water is eliminated.

6. The Commission's Construction Crew shall put the main into service.

6.4.9 Disinfection of Water Service Pipes and By-Pass Hoses

1. Disinfection of Water Service Pipes and Bypass Hoses provides an as needed method for disinfection of Water Services and a mandatory method for disinfection of By-Pass Hoses before being placed in service. The Commission shall determine when a Water Service Pipe shall be disinfected.

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2. The intent is to provide a methodology and a minimum essential standard for disinfection of water services, 2-inches and smaller, that are new, replaced, or repaired and hoses used for By-Pass Connections and house tie-overs. This is an as needed procedure that may be used before any copper tube water service pipe is placed in service. This mandatory procedure shall be used before any hose is placed in service. This applies to any work of any nature being performed within the Commission's Water Transmission or Distribution System.

3. When work on the job has proceeded to the point that all joints have been made, the service shall be flushed at full open until the water runs clear for a minimum of one (1) minute. The water meter must be removed during this flushing operation. The use of a discharge hose is normally necessary.

4. Close the meter valve in the cellar. Close the curb stop at the main, Open the joint on the outlet side of the curb stop at the main. Pour the chlorine and water solution into the tubing that has been prepared according to the Chlorine Disinfection Table that follows.

5. Add the amount of Household Bleach as indicated by the size and length of service to one (1) gallon of water. Strength will be approximately 300 mg/l or 300 PPM.

6. Water Service Pipe Chlorine Disinfection Table

Diameter of Copper Tube Pipe	Approximate Length of Water Service			
	30FT.	**60FT.**	**90FT.**	**120FT.**
¾"	1 oz.	1 ½ oz.	2 ¼ oz.	3 oz.
1"	1 ½ oz.	2 ½ oz.	4 oz.	5 oz.
1 ¼"	2 oz.	4 oz.	6 oz.	8 oz.
1 ½"	3 oz.	5 ½ oz.	8 ½ oz.	11 oz.
2"	15 oz.	30 oz.	45 oz.	60 oz.

7. Remake the connection. With the cellar valve closed, open the curb stop at the main. Open the Cellar valve just enough to get a stream the size of a pencil lead (less than 1/8 of an inch) flow. Let this run until the water smells of chlorine. Shut the cellar valve and wait 15 minutes. After 15 minutes flush very slowly open until all chlorine has been removed.

8. At the conclusion of the disinfection process, pressure test at existing main pipe pressure. After inspecting the joint(s) and eliminating any observed leaks, backfilling may proceed.

9. **IMPORTANT REMINDER**: The most important and most basic factor to ensure that water of the highest quality is provided is to avoid contamination. This is accomplished by using good construction practices, which includes preventing dirt, water, and other contaminating materials from entering the service pipe.

6.4.10 Disinfection of By-Pass Hoses

1. Using the same principles of Service Disinfection above By-Pass hoses are also disinfected. A hose is flushed, dosed, filled, slowly flowed (1/8-inch) and then flushed clear.

2. Storage time and location may require an increase in dose rate and/or slow flow rate.

3. Hoses used for House tie-overs must be disinfected in the same manner as By-Pass Hoses.

6.4.11 Testing of the Water in the New or Repaired Main:

1. The Commission's Authorized Field Representative will communicate with the Commission lab for sampling arrangements needed to obtain all test results.

2. A representative of the Commission's lab will meet the Commission's Authorized Field Representative and Commission's Construction Crew or Installer at the scheduled times and places for sampling of the mains.

3. Primary water quality tests and secondary water quality tests shall be performed by the Commission prior to any Bacteria Samples being taken by the Commission. The Installer shall notify the Commission 24-hours in advance of the chlorine being flushed out of the main.

   (a) The Commission will perform the primary water quality test for chlorine residual and chlorine demand. The free chlorine residual shall be equal to or greater than 0.03 mg/L, unless otherwise approved by the Commission. The chlorine demand shall be essentially satisfied by free chlorine residuals taken over a two (2) hour period.

   (b) The Commission will perform the secondary water quality test for pH and turbidity. The pH shall be less than 9.0 units, unless otherwise approved by the Commission. The turbidity shall be less than 4.0 NTU, unless otherwise approved by the Commission. (All flushing protocols require continued flushing until turbidity values are below 4.0 NTU).

(c) Two (2) primary and two (2) secondary water quality tests will be run by Commission at no cost to the Contractor any additional tests required shall be at the Contractor's expense and at the amount established in the Commission's Rules and Regulations for Water / Sewer Pipe Inspection.

(d) Additional testing by the Commission as a result, of unacceptable water quality in the new main or repaired main, may incur monetary penalties as listed in the Commission's Rules & Regulations.

4. No Bacteria samples will be taken until the primary and secondary water quality tests have met the limits set forth above.

5. Bacteria Samples from the disinfected main will be taken by Commission and will be run through the Commission lab. If a sample does not pass then the Installer shall perform additional flushing and disinfection operations until such time as a good bacteria test is achieved. Additional flushing and disinfection operations shall be run at the Installer's expense.

   (a) Two (2) bacteriological tests will be run by Commission at no cost to the Installer any additional tests required shall be at the Installer's expense and at the amount established in the Commission's Rules and Regulations for Water / Sewer Pipe Inspection.

   (b) Additional testing by the Commission because of unacceptable water quality in the new main or repaired main, may incur monetary penalties as listed in the Commission's Rules & Regulations.

6. The Commission's Construction Crew or Installer shall supply suitable sampling taps at the end of the disinfected water main for the purpose of bacteriological testing. The Owner, Owner's authorized representative, Commission Approved Contractor, or Commission's designee shall cap these taps with a brass cap upon successful completion of the main disinfection.

7. The Commission's Construction Crew or Installer shall make provisions for the sampling. This involves making a copper tube connection to a corporation for every 500 feet, at most, of new pipe (including significant branches) from the source of supply water or as the Commission's Authorized Field Representative allows. A sampling access point shall also exist within 2 feet of the end of the main and at the end of all tie-ins exceeding 50 feet in length. These copper sampling lines shall extend out of the trench to ground level, shall be briefly pre-flushed with chlorine solution (household bleach) and main water, and there will be no water in the trench at the level of the ferrule connection.

8. It is at the discretion of the Springfield Water and Sewer Commission to decide what water quality testing will be done to approve the new water main for release. The water quality must meet all federal, state and Commission standards for water quality.

9. The Commission Representative will inform the Commission's Construction Crew or Installer if the bacterial testing has passed or failed.

6.4.12 What to do when Testing Fails:

1. Re-chlorination or additional disinfection requires loading the whole of the interior of the new water main and fittings with at least 25 ppm of free chlorine.

2. The water main shall sit stagnant for at least 24 hours.

3. The water main shall be flushed according to the Flushing Section.

4. The water main shall be left stagnant for at least 24 hours, and the testing of the water again for approval.

6.4.13 Who to Call with Questions:

For questions relating to filling, flushing, and disinfecting water mains, and other water quality related issues call the Water Quality Manager at the Commission's Customer Service number 413-310-3500.

Section 6.5 Fire Flow Testing Procedures

6.5.1 General

1. The Commission does not perform Fire Flow Tests for private Persons nor provide Fire Flow Test data to private Persons.

2. Private Persons shall apply for a Fire Flow Test(s) in accordance with the Commission's Rules and Regulations and Section 4.1 of the Guidelines and Policies.

3. Commission staff shall be present and observe Fire Flow Test(s).

4. Applicant shall provide their own personnel and equipment, including equipment as specified in these Guidelines and Policies, for each Fire Flow Test(s) to be performed. The Applicant's personnel shall operate the hydrants and observe and record the Fire Flow Test(s) results.

5. The Applicant is responsible for any damage caused to the hydrant and/or property that water is discharged on to.

6. The Commission will notify Customers at least 24-hours in advance of the scheduled Fire Flow Test. Customers to be notified shall be located along the length of the Fire Flow Test and at least 500-feet beyond the test on each side.

6.5.2 Office Planning Prior to Fire Flow Testing

1. Prior to performing the Fire Flow Test(s) the Applicant shall review the Commission distribution map(s) to determine which hydrants will be used to measure flow and which will be used to measure static and residual pressure. It is best to use hydrants that are at the same elevation or measure the differences in elevation in the field. The Fire Flow Test(s) usually involves two (2) fire hydrants. The first one is called the static and residual hydrant. The second one is called the flow hydrant.

2. Review, if available, previous Fire Flow Test data to estimate the flow and pressure that may be expected.

6.5.3 Field Fire Flow Test Procedures

1. In order to obtain valuable flow test data, flow and pressure readings need to be taken accurately and all necessary data recorded. Calibrated gauges are required and shall be checked regularly and recalibrated as necessary. Preprinted Fire Flow Test Form(s), attached in Section 15.1.9 of these Guidelines and Policies, are to be used to record the following information:

   (a) Date, time of day, temperature, weather, and work order number,

   (b) Static and residual hydrant number, manufacturer and model, street name, location, and main size,

   (c) Static reading at the static and residual hydrant,

   (d) Residual reading at the static and residual hydrant

   (e) Flow hydrant number, manufacturer and model, street name, location, and main size,

   (f) Pitot and/or residual pressure reading at the flow hydrant,

   (g) Total Flow in gallons per minute (GPM) during test, estimated flow available in GPM at 20-PSI, length of time of flow in minutes, and total gallons flowed, and

   (h) Name of observer(s) and Commission Inspector(s).

2. Prior to beginning the Fire Flow Test, notify Customer Service that a Fire Flow Test is going to take place. Provide Customer Service with a location such as, an address or intersection and estimated duration of the Fire Flow Test(s).

3. Make sure provisions are made for minimizing interruption of traffic and for adequate drainage of water.

4. Locate the static and residual hydrant and do the following:

   (a) Remove one of the 2-1/2-inch hydrant nozzle caps and open the hydrant slowly to the full open position to flush sediment out of the hydrant that could damage the gauge.

   (b) When the flush water has cleared slowly close the hydrant and install a 2-1/2-inch hydrant nozzle cap equipped with a pressure gauge and air bleed valve.

   (c) Slowly open the hydrant allowing water under pressure into the hydrant. Open the bleed valve until a steady stream of water is discharged and no air is present.

   (d) Close the bleed valve and wait a minute or two until the pressure gauge has stabilized and read the gauge.

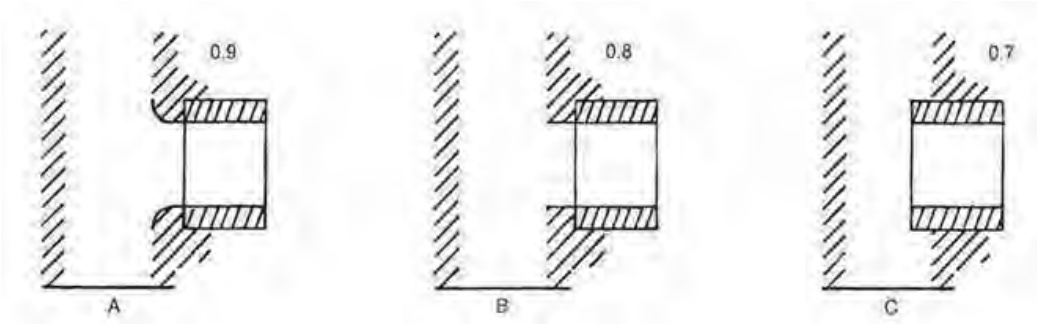
   (e) This pressure reading is referred to as the static pressure. This represents the water pressure in the water main as measured at the elevation of the hydrant outlet. Record this reading on the Fire Flow Test Form.

5. Locate the flow hydrant(s) and do the following:

   (a) Remove one of the 2-1/2-inch hydrant nozzle caps and measure the inside diameter to the nearest 1/16-inch. Typically, hydrants within the Commission's distribution system have a 2-1/2-inch inside diameter, but should be measured for each fire flow test.

(b) Determine the outlet nozzle coefficient (C).

- C = 0.9 when the outlet nozzle is smooth and well rounded, A below
- C = 0.8 when the outlet nozzle is square and sharp, B below
- C = 0.7 when the outlet nozzle is square, sharp and projecting into the barrel, C below
- Outlet nozzle Coefficients:



- Typically, new hydrants in the Commission distribution system have smooth and well rounded out let nozzles with a C = 0.9, but older hydrants need to be checked.

(c) If a pitot gauge is not going to be used or back-up flow data is required install a 2-1/2-inch hydrant nozzle cap equipped with a pressure gauge on the 2-1/2-inch nozzle not going to be used to flow water.

6. Conduct the Fire Flow Test as follows:

(a) Station one (1) observer at the static and residual hydrant and one (1) observer at each hydrant to be flowed.

(b) Open each flow hydrant slowly to the fully open position to create a steady flow of water from the outlet. Open one (1) hydrant at a time to avoid a pressure surge. In some cases, the resulting horizontal water flow from the hydrant(s) may be sufficiently disruptive to justify street closures.

(c) When pressure at the static and residual hydrant has stabilized the observer signals the observer(s) at the flow hydrant(s) to take the readings. The pressure reading at the static and residual hydrant is taken the same time as the reading at the flow hydrant. The pressure reading at the static and residual hydrant while the flow hydrant(s) is discharging is called the residual pressure. The residual pressure records both the domestic and fire flows occurring in the water main.

(d) A pressure gauge installed on a pitot tube (pitot tube) is used to measure the velocity pressure of the stream discharging from the hydrant. All the air should be exhausted from the discharge before a pitot reading is taken. For an accurate pitot reading the pitot tube must be held in the center of the nozzle, with the axis of the pitot tube parallel to the direction of flow. The pitot tube should be held away from the end of the nozzle at a distance of about half the nozzle diameter (for a 2-1/2-inch nozzle about 1-1/4-inches).

(e) The pressure gauge installed on the unused nozzle will provide a pressure reading similar to the pitot tube reading, but typically the flow results are more conservative.

(f) Record the both the pitot tube reading (and/or the pressure gauge reading on the second nozzle) and the residual pressure reading at the static and residual hydrant on the Fire Flow Test Form.

7. Shut down the Fire Flow Test and observe the following:

(a) The final step in the flow test involves shutting down the flow hydrant(s) slowly and taking another static pressure reading as a check on the previous reading.

(b) The two readings must be similar. There are good reasons to double-check the static pressure. If the second static pressure reading falls very far below the first one recorded, it's possible that a water main broke during the test. Contact Customer Service at 413-787-6207 and report the low pressure and possible main break.

(c) For reasonably accurate results the pressure drop between the static and residual pressures should at least 10- pounds per square inch (PSI). If the piping system is strong and the pressure drop is less than 10-PSI an additional flow hydrant should be added to the test and another fire flow test should be performed.

(d) It is best for the observers to calculate the Fire Flow Test Results in the field, so that if results appear to be in error, the test can be repeated immediately.

(e) To calculate Flow in gallons per minute (GPM) "Q" use the following equation, where the pitot pressure reading in PSI is "P", the hydrant nozzle diameter in inches is "D" and the hydrant coefficient is "C":

- $Q = 29.83*C*D^2*\sqrt{P}$
- Also see Fire Flow Discharge Tables attached in Sections 15.1.10, 15.1.11, and 15.1.12 of these Guidelines and Policies.

(f) To calculate the Available Flow at 20-PSI in GPM "Q-20" use the following equation, where the sum of the actual flow(s) in GPM is "Q" from the previous equation for each flow hydrant, the static pressure in PSI is "S", the residual pressure in PSI is "R":

- Q-20 = Q*((S-20)^.54/(S-R)^.54)
- Also see Values for Pressure to the .54 Power Table attached in Section 15.1.13 of these Guidelines and Policies.

8. Cautions to observe during Fire Flow Testing are as follows:

(a) Opening a hydrant rapidly can cause a negative pressure fluctuation. Hydrants should be opened slowly until fully opened.

(b) Closing hydrants is more critical and must be done very slowly until after the flow has diminished to about 20-percent. Closing a hydrant to quickly could cause a pressure surge, or water hammer, this could cause a weakened main to fail.

(c) Hydrants should be opened and closed one at a time to minimize the effect on the distribution system.

(d) Hydrants must be opened fully because the drain-valve mechanism operates the main valve. A partially opened hydrant could force water though the drain outlets under pressure, eroding the thrust support behind the hydrant.

(e) After the Fire Flow Test, the hydrant should be drained before the outlet nozzle cap(s) are tightened. If nozzle caps are tightened before the hydrant drains, water could remain in the hydrant barrel and freeze in the winter causing the hydrant to be out of service.

(f) Readings taken on any gauge instrument should only be taken when the water is running clear because sediment could damage the instrument.

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CHAPTER 7 WATER SERVICES

Section 7.1 Purpose

1. These procedures are established by the Commission in order to establish standard procedures for the replacement of unserviceable water services and for the installation of new water services. The goal in establishing these procedures is to achieve a completed installation that ensures the protection of water quality, a leak free connection, the use of high quality materials, a reliable service protected from freezing, and efficiently installed
2. Procedures for the issuance of the work order are covered in other sections of these "Guidelines and Policies" and in the "Rules and Regulations of the Commission".

7.1.1 General

1. All material shall be as specified in the Commission's Material Specifications.
    - Water Services 2-inch and less shall be copper tube
    - Water Services 4-inch and larger shall be ductile iron
    - No 4-inch valves are allowed
2. The water meter shall be sized and provided by the Commission.
3. All water services shall be sized by the Owner or the Owner's authorized representative.
4. Depth of cover: - The 2-inch or less copper tube water pipes shall be laid a minimum of 5 feet deep, a maximum of 6-feet deep unless otherwise approved by the Commission, on suitable bedding, and backfill with proper material. No large stone or debris will be acceptable in the trench.
5. Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission's Health and Safety Policies.
6. Utility Separation: - All water services shall be separated from other utilities and septic fields in accordance with the 310 Code of Massachusetts Regulations. Furthermore, the separation shall be in accordance with **Service Separation Detail (W-01.1).**
    (a) At a minimum, any water service shall be horizontally 10-feet from any sewer lateral and laid above/over any sewer main or lateral, unless otherwise approved by the Commission.

(b) At a minimum, all water services at a minimum shall be horizontally 4-feet from any other water service or other utility unless otherwise approved by the Commission.

7. In the absence of a recognized and/or approved industry standard for such hardware the Commission will be the final judge as to the acceptability of miscellaneous hardware used in the installation of water services.

8. The installed water service pipe and/or replacement service shall be disinfected according to Disinfection Section of these Guidelines and Policies, unless otherwise approved by the Commission.

9. During the Application process, a Proposed Site Plan must be submitted according to Section 4.2 of these Guidelines and Policies for review and approved by the Commission. This section describes the requirements for installing new and replacement Water Service Pipes in the location as defined on the approved plan.

10. The type of joint referred to as Quick Joint is based on the Mueller 110 Compression Joint or an equivalent approved by the Commission.

11. All copper tube water services must be visually inspected by a Commission inspector prior to backfilling. The corporation, curb valve and any couplings must be left exposed for inspection prior to backfilling.

12. A leak test may be required and shall be at the Commission's discretion. The test shall be a static pressure test of the service and visually inspecting each joint along the service to ensure that there is no leakage according to Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission.

Section 7.2 Water Service - Two (2) Inch and Less

7.2.1 Installation of New Water Service Pipes

This procedure is written for installation of three-quarter-inch (¾") – NO LONGER ALLOWED, one-inch (1"), one-and-one-half-inch (1-½") and two-inch (2") copper tube water service pipes. Sizes ¾-inch and 1-1/4-inch services have been eliminated and replaced with standard sizes 1-inch, 1-½-inch, and 2-inch. On occasion and as directed by the Commission, the eliminated ¾ and 1-1/4-inch tubing sizes may be considered but shall be approved by the Commission prior to installation.

7.2.2 Ball Type Corporation Stops

1. Ball Type Corporations Stops (corporations) shall be installed horizontally on all water services at the service tap into the water main in accordance with **New**

Water Service Installation Detail (W-11.0) and with a Buffalo style Arch pattern curb box, in accordance with **Service Box Detail at the Tree-belt (W-12.0) and/or Service Box Detail at the Main (W-12.1)**.

(a) Typically, corporations are installed by the Commission or the Commission's designee unless other arrangements are made with the Commission's Engineering and Technical Services (E&TS).

(b) The Owner or the Owner's authorized representative shall make arrangements with the Commission's E&TS after an Application for a water service has been filled out and signed by the Owner.

2. Corporations may be direct tapped into ductile iron water main as follows:

Tap Size	Main Sizes which may be direct tapped
1-inch	none
1-1/2-inch	none
2-inch	none

3. Corporations must be tapped through a tapping saddle.

4. A tapping machine shall be provided which will permit tapping mains under pressure, also a supply of combination drills and taps having Mueller threads.

5. The tapping machine shall be rigidly fastened to the pipe horizontal to the pipe axis as detailed on the Drawings. The length of travel of the tap should be so established that when the stop is inserted and tightened with a 14-inch wrench, not more than one to three threads shall be exposed on the outside. When a wet tapping machine is used, the corporation stop shall be inserted with the machine while it is still in place. Stops shall be tightened only sufficiently to give water tightness and care must be constantly exercised not to over tighten them. All Ball Type Corporations stops shall be set on a concrete brick.

7.2.3 Copper Tubing

1. Care shall be exercised in the placing and laying of copper tubing to be sure that the pipe does not have kinks or sharp bends and to assure against its being in contact with sharp stones or ledge which would cause damage to the pipe.

2. At least 6-inches of processed gravel shall be placed adjacent to and above the pipe, and no stone shall be placed over the pipe until the depth of backfill above the copper tube is in excess of 1-foot.

3. The use of soldered fittings underground prior to Commission meter is prohibited.

4. No crimping tools may be used on copper tubing.
5. If copper becomes kinked or egg shaped in its installation, the use of that section of copper containing the kink or egg shape will be disallowed. Final decision as to the acceptability of a "kink" or a section of "egg shaped" pipe shall be made by Commission.
6. Copper tubing shall be installed with brass compression fittings according to the Water Service Installation Section of these Guidelines and Policies.
7. Copper tubing water services shall be bedded and installed in accordance with New Water Service Installation Detail (W-11.0) and/or Replacement Water Service Installation Detail (W-11.1).
8. Copper tubing water services installed with less than 18-inches of tubing beyond the wall or above the floor shall be reinstalled in its entirety by the Installer.

7.2.4 Ball Valve Curb Stops

1. 1-inch, 1-1/2-inch, and 2-inch curb stops shall be installed with a Buffalo style Arch pattern curb box, in accordance with **Service Box Detail at the Tree-belt (W-12.0) and/or Service Box Detail at the Main (W-12.1)**.
2. Curb stops shall be installed as close as practicable to 1' of the edge of the municipal ROW within the municipal ROW. Under no circumstances is the curb stop to be installed beyond the municipal ROW or onto private property.
3. Curb stops shall be installed with the operator plumb and vertical.
4. Curb stops shall be set on a 2-inchx6-inchx12-inch piece of pressure treated blocking or a flat rock of similar dimensions.

7.2.5 Compression Couplings

1. Install straight Compression couplings to existing service connections of the sizes required in the locations designated by the plans, Commission's Authorized Field Representative, or where required to extend or relocate the water service pipe. The manufacturer's recommended installation procedures shall be utilized while performing the work. Care shall be taken to ensure a watertight connection.
2. The compression coupling shall be centered over the connection point of the pipes being joined.
3. The coupling shall be tightened in accordance with the manufacturer's recommendations. Do not over tighten the coupling.
4. No couplings are allowed before meter valves in building.

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7.2.6 Service Boxes

1. Service box bases shall be centered over the curb stop ball valve and shall be plumb and vertical in all directions. The box bottom shall be placed on the same blocking or flat surface as the curb stop.
2. Service box tops and bases shall have a minimum 6-inches of overlap.
3. Service box tops shall be painted florescent blue after installation.
4. Service boxes installed in tree-belts sidewalks, or driveways shall be installed flush with the existing finished grade and in accordance with **Service Box Detail at the Tree-belt (W-12.0).**
5. Service boxes installed at the water main and typically in paved or non-paved roadways shall be set buried 24-inches below finished road grade and in accordance with **Service Box Detail at the Main (W-12.1).**
    - Service boxes installed over 1-1/2 and 2-inch corporation shall have approximately ½-inch removed off the side closest to the water main by cutting or grinding in order to center the box over the valve.
6. Maintain a minimum of a 4’ clearance in all directions from curb box to other utilities, structures, appurtenances or obstructions.

Section 7.3 Installation of New Water Service Pipe

7.3.1 Product Installation – New Water Service Pipe

1. All material shall be in accordance with the Commission’s Material Specifications.
2. The actual new water service installation will be done in accordance with the **New Water Service Detail (W-11.0)**. This drawing is an integral component of the Service Installation Procedure.
3. The connection or tap at the water main will be made using a ball type corporation stop, which also serves as a curb stop when equipped with a tee head adapter.
4. The new copper tube shall be laid in a trench that has been excavated to a depth that will provide 5-feet and 6-inches of cover when final grading is established.
5. A second curb stop will be installed approximately 2-feet from the curbing or edge of road in the direction of the building.

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6. The Curb Box over the Corporation at the main will be set buried 24-inch below finished road grade and in accordance with **Service Box Detail at the Tree-belt (W-12.0).**

   (a) Water shall be turned on prior to back filling to note any leaks and to ensure it is on.

   (b) The curb box base shall be placed on same blocking as curb stop

7. The Curb Box located between the curbing and the property line will be set to finished grade and accordance with **Service Box Detail at the Main (W-12.1)**. Before backfilling, all joints must be pressure tested using existing pressure in the main.

8. The meter valve in the cellar shall be a Ball Valve selected from one (1) of the following:

   (a) When entering the building through the basement floor or slab a Ball Meter Valve - 90º Angle: 1-inch Quick joint x ¾ or 1-inch meter swivel nut or Quick Joint x Elliptical flange in sizes 1 ½-inch and 2-inch. This is the normal valve used.

   - Note: this valve is a curb stop with a brass handle used as inside meter valve.

   (b) When entering the building through a foundation wall typically, a Ball Meter Valve – straight is used but as described in the following selected cases:

   - 1-inch Quick joint x ¾ or 1-inch meter swivel nut,
   - 1-½-inch or 2-inch Quick Joint x Elliptical flange.
   - For 1-inch water services when necessary to keep the meter within 18-inches of the wall a Ball Meter Valve - 90º Angle: 1-inch Quick joint x ¾ or 1-inch meter swivel nut may be used (same as 8. (a) above).
   - For 1-1/2-inch or 2-inch water services when necessary to keep the meter within 18-inches of the wall a 1-1/2-inch or 2-inch Quick Joint x 1-1/2-inch or 2-inch Female Iron Pipe (FIP) 90-degree elbow, and a 1-1/2-inch or 2-inch Male Iron Pipe (MIP) x 1-1/2-inch or 2-inch elliptical flange Ball Meter Valve – straight may be used for the meter valve.

   (c) Ball Type Curb Stop: 1-inch Quick Joint x 1-inch FIP. This is most common in replacement service work.

   - Note: This is a Curb Stop with brass handle used as an inside cellar meter valve.

9. The leak inspection shall be conducted in the trench at each joint by a competent work person.

10. Joints shall be "Bubble Tight", i.e. DRY.

11. Before the meter is connected to the new service, the line shall be flushed clean at full pressure using the Ball Valve Curb Stop at the main in accordance with Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission. The service may be disinfected at the discretion of the Commission in accordance with Section 6.4.9 of these Guidelines and Policies. The trench shall be backfilled, compacted and the road patched as necessary. Care must be taken to protect the tubing from being damaged by backfilling, and to ensure the curb boxes are plumb, set at the correct grade, and centered over the valve.

12. The entry point of the tubing through the foundation shall be patched both inside and outside using duct seal and mortar to prevent water entry.

13. For purposes of the record sketch water service card, a minimum of three (3) location ties will be taken along with other measurements. The service installation sketch and final service card shall indicate curb stop at main "buried 2-feet"; curb stop at edge of road shall indicate "set to finished grade". The location of any fittings along the service line should be noted

14. Commission Construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.

15. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

Section 7.4 Replacement of Existing Water Service Pipe

7.4.1 General

1. This section describes the requirements for replacing existing water service pipes in the same location that are no longer serviceable. Serviceability issues may be due to internal and/or external corrosion, poor flow, poor pressure, leaks, or any combination of these condition factors.

2. This procedure is written for replacement of ¾-inch, 1-inch, 1-1/4-inch, 1-1/2-inch, and 2-inch copper tube, brass, or iron Water Service Pipes. If the existing Water Service Pipe is ¾-inch and 1-1/4-inch it shall be replaced with standard sizes as directed by the Commission.

3. The type joint referred to as Quick Joint is based on the Mueller 110 Compression Joint or an equivalent approved by the Commission. No soldered joints are allowed.

4. No joint repairs shall be installed inside a building. All joint repairs shall be outside the building.

5. An existing Water Service Pipe may be replaced in accordance with Section 7.3 of these Guidelines and Policies or may be pulled in accordance with this Section of these Guidelines and Policies. It is at the Commission's discretion which method shall be allowed on a case by case basis.

   (a) Installer shall open cut all water services from main to home/building and replace Water Service Pipes in accordance with Section 7.3 of these Guidelines and Policies.

   (b) Commission Construction Crews or Commission Approved Contractors hired by the Commission to replace water service may pull Water Service Pipes in accordance with this Section of these Guidelines and Policies.

6. All copper tube water services must be visually inspected by a Commission inspector prior to backfilling. The corporation, curb valve and any couplings must be left exposed for visual inspection when the water service is temporarily turned-on. The test shall involve pressuring the service with the water service turned-on and visually inspecting each joint along the service to ensure that there is no leakage. At the Commission's option a completed water service may be required to pass a leak test as described below.

7. A leak test is required before an existing or repaired 1-inch or greater Water Service Pipe may be reused and/or turned-on. No ¾-inch Water Service Pipe may be reused.

7.4.2 Leak Testing – Existing Water Service Pipes

1. The leak test shall be performed by the Commission's operation staff.

2. The Customer or a Customer representative must be present to observe the leak test.

3. The existing water service must be able to be isolated from the shut-off valve at the main to the first meter valve. If a meter valve is installed on each side of the meter than each meter valves should be closed.

4. The meter shall be removed and a pressure gauge with a bleed valve shall be installed on the closed first meter valve.

5. Open the first meter valve and bleed air out of existing water service into a 5-gallon bucket through the bleed valve. When all the air has been bled close the bleed valve. Check for leaks, if there are no leaks read the pressure gauge. If there are leaks at loose fittings the fittings must be tightened until there are no leaks and then the pressure gauge can be read.
6. Close the shut-off valve in the street. At this point the Water Service Pipe is at the same pressure as the Public Water Main and should remain so.
7. If the pressure gauge remains constant it indicates there are no leaks on the Customer's Water Service Pipe, and it may be reused.
8. If the pressure immediately drops or over a 5-minute period it continues to drop the Water Service pipe has a leak on it and must be replaced.
9. This test is conducted three (3) times during the service call to determine if the existing Water Service Pipe can be reused or if it must be replaced.
10. 2-inch brass Water Service Pipe may be repaired if the leak location can be determined in a timely manner and at the discretion of the Commission.
11. The Customer is notified at the completion of the leak test(s) whether the existing Water Service Pipe has passed or failed. If the Water Service Pipe has failed the Customer is asked to apply for a Replacement Water Service at the Commission's customer Service Office at 71 Colton Street Springfield MA.

    (a) If the leak is not causing a safety issue and is located in the Customer's property, the Customer will be allowed five (5) workdays to apply for a replacement water service.

    (b) If the leak is causing a safety issue and/or is located is the public right-of-way the customer shall immediately apply for a replacement water service or be subject to immediate Turn-off by the Commission.

7.4.3 Product Installation – Existing Water Service Pipe

1. All material shall be in accordance with the Commission's Material Specifications.
2. The actual water service replacement may be done in accordance with the **Replacement Water Service Detail (W-11.1)** (this drawing is an integral component of the water service replacement procedure) or the existing service may be abandoned in place. This decision is at the discretion of the Commission and will be decided on a case-by-case basis.

3. Abandonment in place requires the existing corporation to be exposed, turned off, capped with a brass cap, and backfilled. Typically, this can be done in the same excavation as the new service connection.

4. Abandonment in place or replacement by open trench requires the installation of a new water service pipe in accordance with Section 7.3 of these Guidelines and Policies, unless otherwise approved by the Commission.

5. Replacement of the existing water service by pulling the old and new water service pipe shall be as follows:

6. Existing service replacement will be accomplished by excavating a safe hole that exposes the corporation stop and curb stop.

   (a) The existing ¾-inch cc x 1-inch MIP Corporation Stop will be reused if and only if it is serviceable and free from leaks.

   (b) The Mueller B101 Drilling and Tapping Machine (or equivalent type) can be used to replace a corporation stop under pressure when the stop is unserviceable or leaking.

7. The new copper tube shall be attached to the old pipe in the cellar.

8. From the street hole, the old pipe is pulled, and the new tubing follows.

9. The reconnection at the main is made using a Ball Valve Curb Stop 1-inch FIP x 1-inch Quick joint. Buffalo style curb boxes at the main will be removed, legally disposed of, and replaced with a new Buffalo box long. The Curb Box over the Curb Stop at the main will be set buried 2-feet below finished road grade.

10. When the existing curb stop is removed, the existing corporation stop must be cleaned in the opened position using a cleaning tool with a cutter of the appropriate size.

11. It is mandatory that a second hole be excavated over the new copper tubing approximately 2-feet from the curbing or edge of road in the direction of the building. In sub-division or on unimproved roads (dirt), the location will be indicated by the plans or the Commission's Authorized Field Representative.

    (a) At this location, a second Ball Valve Curb Stop with Quick joint both ends will be cut in.

    (b) The Buffalo Box over the Curb Stop at the main will be set buried 24-inch below finished road grade and in accordance with **Service Box Detail at the Main (W-12.1)**.

(c) The Buffalo Box located between the curbing and the property line will be set to finished grade and accordance with **Service Box Detail at the Tree-belt (W-12.0).** Before backfilling, all joints must be pressure tested using existing pressure in the main.

(d) For purposes of the record sketch water service card, a minimum of three (3) location ties will be taken along with other measurements.

(e) Before backfilling, all joints must be pressure tested using existing pressure in the main. The leak inspection shall be conducted in the trench at each joint by a Commission Authorized Field Representative. Joints shall be "Bubble Tight", i.e. DRY.

12. The installation of a curb stop at a point between the curbing (or edge of pavement) and the property line is MANDATORY. If this valve cannot be installed, this exception must be identified during the pre-job site visit.

(a) A request for exception to this procedure must be written by the Owner, the Owner's authorized representative, or the Commission's designee who has conducted an onsite evaluation.

(b) This request will be submitted to the Commission for evaluation and written approval or disapproval.

(c) Five working days must be allowed for the Commission portion of the exception process.

13. The meter valve in the cellar shall be a Ball Valve selected from one (1) of the following:

(a) Ball Type Curb Stop: 1-inch Quick Joint x 1-inch FIP. This is most common in replacement service work.

- Note: This is a Curb Stop with brass handle used as an inside cellar meter valve.

(b) When entering the building through the basement floor or slab a Ball Meter Valve - 90º Angle: 1-inch Quick joint x ¾ or 1-inch meter swivel nut or Quick Joint x Elliptical flange in sizes 1 ½-inch and 2-inch. This is the normal valve used.

(c) When entering the building through a foundation wall typically, a Ball Meter Valve – straight is used but as described in the following selected cases:

- 1-inch Quick joint x ¾ or 1-inch meter swivel nut,
- 1-½-inch or 2-inch Quick Joint x Elliptical flange.

- For 1-inch water services when necessary to keep the meter within 18-inches of the wall a Ball Meter Valve - 90º Angle: 1-inch Quick joint x ¾ or 1-inch meter swivel nut may be used (same as 13. (a) above).
- For 1-1/2-inch or 2-inch water services when necessary to keep the meter within 18-inches of the wall a 1-1/2-inch or 2-inch Quick Joint x 1-1/2-inch or 2-inch Female Iron Pipe (FIP) 90-degree elbow, 1-1/2-inch or 2-inch Ball Meter Valve – straight, and a 1-1/2-inch or 2-inch Male Iron Pipe (MIP) x 1-1/2-inch or 2-inch elliptical flange meter valve may be used.

14. The Quick type compression joint requires that the copper tubing be round not flattened. Copper tubing supplied in coils and transported to a job site can be expected to be partially flattened. This must be corrected by using a flaring tool or rounding tool of the appropriate size.

15. Before the meter is connected to the new service, the line shall be flushed clean at full pressure using the Ball Valve Curb Stop at the main in accordance with Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission. The service may be disinfected at the discretion of the Commission in accordance with Section 6.4.9 of these Guidelines and Policies. The trench shall be backfilled, compacted and the road patched as necessary. Care must be taken to protect the tubing from being damaged by backfilling, and to ensure the curb boxes are plumb, set at the correct grade, and centered over the valve.

16. The entry point of the tubing through the foundation shall be patched both inside and outside using duct seal and mortar to prevent water entry.

17. Both holes shall be backfilled, compacted and patched or restored as necessary. The entry point of the tubing will be patched in the cellar using duct seal to prevent water entry.

18. For purposes of the record sketch water service card, a minimum of three (3) location ties will be taken along with other measurements. The service installation sketch and final service card shall indicate curb stop at main “buried 2-feet”; curb stop at edge of road shall indicate, “set to finished grade”. The location of any fittings along the service line should be noted

19. Commission construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.

20. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

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Section 7.5 Seasonal Water Services

7.5.1 General

1. Seasonal water services are typically some type of irrigation system and requires a backflow preventer. This section will address 2-inch and smaller copper tube irrigation systems. All other seasonal water services or larger ductile iron water services shall be reviewed by the Commission.
2. Seasonal water services shall have a maintenance plan to protect the Commission's meter from freezing and approved by the Commission prior to the water service being turned on.
3. Seasonal water service shall be installed in accordance with Section 7.1, Section 7.2, Section 7.3, and/or Section 7.4 of these Guidelines and Policies and the following:

7.5.2 Product Installation – Seasonal Water Services 2-inch and less

1. All material shall be in accordance with the Commission's Material Specifications.
2. The Seasonal Water Service installation will be done in accordance with the Seasonal Water Service Detail (W-17.0), Seasonal Water Service Base Detail (W17.1), and Seasonal Water Service Cover Detail (17.2). These drawings are an integral component of the Seasonal Service Installation Procedure.
3. The copper tube from the water main for a seasonal water service shall terminate on public property at a concrete pad and enclosure which shall be located on the public property.
4. The meter shall be installed before the backflow preventer.
5. The enclosures shall be set on concrete pads at least 54-inches long, 34-inches wide, and not more than 60-inches long, 50-inches wide and 6-inches thick with two (2) 3-inch sleeves for the water service pipe and sprinkler pipe to enter and exit or as otherwise approved by the SWSC during the submittal process. The sleeves shall be centered along length and be at least 6-inches to 12-inches from ends. The pad shall be placed on a base of at least 6-inches of ¾-inch crushed stone.
6. The enclosures shall be a minimum size of 48-inches long, 24-inches wide, and 32-inches high, a maximum of 54-inches long, 44-inches wide, and 38-inches high, or as otherwise approved by SWSC during the submittal process. Please note the enclosures submitted must fit on the pads and must enclose the complete meter and backflow preventer assembly described herein.

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7. On an existing water service to an island or greenspace the Installer shall provide and install the following:

   (a) A drilled curb stop with a full length water service box shall be provided in the treebelt before the enclosure to allow the water service to drain prior to the winter.

   (b) New copper tube from the curb stop into the enclosure.

   (c) One (1) angle meter valve

   (d) Two (2) meter couplings (meter spuds)

   (e) Space for SWSC meter between meter couplings

   (f) Convert to iron pipe thread and One 90-degree bend up

   (g) One (1) testable vacuum breaker assembly or reduced pressure zone assembly – each includes two valves as part of the assembly

   - A testable Pressure Vacuum Breaker assembly (PVB) is allowed when the PVB can be installed at least 12 inches or greater above the highest sprinkler head. A PVB is designed to prevent only back-siphonage and is designed for use under static line pressure. A PVB is not allowed where back-pressure is possible. A Reduced Pressure Zone assembly (RPZ) is required when a PVB does not meet the installation requirements. A single spigot is allowed on the downstream side of a RPZ and on the downstream side of a PVB installed 12 inches below the PVB. (The highest sprinkler head and/or fixture shall be 12-inches or greater below the PVB. If it is less than 12-inches a RPZ is required.)

   (h) One 90-degree bend with IP by Quick Joint ends

   (i) Copper tube to sprinkler control box

8. On a new water service to an island or greenspace the Installer shall provide and install the following:

   (a) The installer shall have a public water main tapped with a corporation, water service box 2-feet below finish pavement, and new copper tube from corporation to treebelt.

   (b) A drilled curb stop with a full length water service box shall be provided in the treebelt before the enclosure to allow the water service to drain prior to the winter.

(c) New copper tube from the curb stop into the enclosure.

(d) One (1) angle meter valve.

(e) Two (2) meter couplings (meter spuds).

(f) Space for SWSC meter between meter couplings.

(g) Convert to iron pipe thread and one 90-degree bend up.

(h) One (1) testable vacuum breaker assembly or reduced pressure zone assembly – each includes two valves as part of the assembly

- A testable vacuum breaker is allowed when the highest sprinkler head and/or fixture is 12-inches or greater below the breaker. If it is less than 12-inches a RPZ is required

(i) One 90-degree bend with IP by Quick Joint ends.

(j) Copper tube to sprinkler control box.

Section 7.6 Ductile Iron Water Services 4-inch and Larger

7.6.1 General

1. During the Application process, a Proposed Site Plan must be submitted according to Section 4.2 of these Guidelines and Policies for review and approved by the Commission. This section describes the requirements for installing new water service pipes in the location as defined on the approved plan.

2. A Design Memo issued by the Commission's Engineering and Technical Services (E&TS) shall provide all requirements of the installation.

   (a) The design memo and associated plans shall always be on site by the Installer(s).

3. New ductile iron water services 4-inch and larger shall be installed, flushed, leak tested, and disinfected in accordance with CHAPTER 6 of these Guidelines and Policies and the additional requirements of this section. In addition to the required Commission testing a fire service pipe shall meet the requirements of the Fire Department Flush Tests described below.

4. All material supplied shall be in accordance with the Commission's Material Specifications.

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5. A minimum of 18-inches of clearance is required from the wall(s) and the floor to the side and bottom of the pipe as of January 1st, 2014, unless otherwise approved by the Commission. Pipe shall not be installed more than 4-feet above the floor.
6. 5-feet of cover over the water service pipe is required, unless otherwise approved by the Commission.
7. All shut-off valves at the water main shall be 6-inch or larger. If a 4-inch ductile iron water service is required, the Installer shall provide a 6-inch connection and 6-inch shut-off valve and then reduce to 4-inch.
8. A stainless steel (SS) or ductile iron (DI) tapping sleeve, or a mechanical joint (MJ) tee is required on the main in front of the property to be served, unless otherwise approved by E&TS.
9. A 6-inch or larger tapping by MJ or MJ by MJ gate valve is required, unless otherwise approved by E&TS.
10. A 1-inch Air corporation or 1-inch Air valve Assembly for disinfecting the Water Service Pipe or fire Service Pipe is required after the gate valve at the main. The Commission shall determine if an Air Corporation or Air Valve Assembly is required.
11. All tees, bends, crosses, and other fittings shall be ductile iron mechanical joint unless otherwise approved by the Commission. If a reducer is required, it shall be DI MJ by MJ.
12. All pipe shall be DI, thickness class 52, cement lined, and polyethylene encased (underground only).
13. A companion flange(s) shall be temporarily bolted onto the flanged OS&Y gate valve(s). The companion flange(s) shall have a 2-inch threaded outlet. The threaded outlet shall be utilized for flushing, leak testing, and disinfection.
14. When the water service pipe is to be utilized for a fire service pipe the OS&Y gate valve is not required. The companion flange may be installed on the first flange through the wall or floor.
15. All joints outside/underground shall be MJ or push-on. The final 80-feet shall be fully restrained to the flange (F) connection(s) for the outside, spindle and yoke (OS&Y) gate valve(s), in accordance with Commission Material Specification - Joint Accessories.
16. All joints inside and/or above grade shall be flanged, in accordance with Commission Material Specification – Flanged Pipe. Flanged joints shall be joined

with gaskets and stainless steel hardware in accordance with Commission Material Specification - Joint Accessories.

7.6.2 Main to Meter Vault or Basement

1. The Water Service Pipe from the main to the meter vault or basement shall be installed in accordance with Section 7.6.1, above and the following:

2. The Water Service Pipe for the Main to Meter Vault shall be installed in accordance with **Typical Ductile Iron Water Service through Foundation Wall Detail (W-13.4)**.

3. A DI MJ by MJ solid sleeve with restrainer glands or gasket joint restraint at the bell shall connect the F by plain end (PE) by minimum 6-feet long DI pipe to the DI pipe from the gate valve in the street.

4. The F by PE by minimum 6-foot pipe shall be additionally restrained in place with ¾-inch rods from the flange to the mechanical joint. All rods and other hardware shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.

   (b) Alternatively, if a mechanical joint solid sleeve is not used then the F by PE pipe shall be restrained in place with a steel socket clamp installed at the exterior of the meter vault wall and ¾-inch rods from the socket clamp to the flange. All socket clamps, rods, and other hardware shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.

5. An F by F OS&Y gate valve shall be installed onto the flange through the wall.

   (a) For Fire Services this valve is referred to as the building control valve and shall be in accordance with the Commission's Material Specifications.

   (b) For Commercial and Industrial Water Services all the valves, fittings, strainers, pressure reducing valves, and check valves shall be that is in accordance with the Commission's Material Specifications.

6. Annular space through meter pit or basement wall may be filled with a link-seal or non-shrink grout/hydraulic cement.

7.6.3 Main to Floor Slab

1. The Water Service Pipe from the main to the floor slab shall be installed in accordance with the Section 7.6.1, above and the following:
2. The Water Service Pipe for the Main to Floor Slab shall be installed in accordance with **Typical Ductile Iron Water Service through Concrete Floor Detail (W-13.5)**.
3. A minimum of 80-feet from the first flange on the 90-degree bend below the slab out toward the main shall be fully restrained.
4. The 90-degree bend below the slab shall be DI MJ by MJ and a thrust block shall be installed to undisturbed soil.
5. The 90-degree bend above the floor slab is required and it shall be DI F by F.
6. An F by PE DI pipe shall connect the two bends. The pipe shall be cut to ensure the proper cover and height of the flange.
7. The F by PE by minimum 6-foot pipe shall be additionally restrained in place with ¾-inch rods from the flange to the mechanical joint. All rods and other hardware shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.
8. An F by F OS&Y gate valve shall be installed onto the flange of the 90-degree F by F bend.

   (c) For Fire Services this valve is referred to as the building control valve and shall be in accordance with the Commission's Material Specifications.

   (d) For Commercial and Industrial Water Services all the valves, fittings, strainers, pressure reducing valves, and check valves shall be that is in accordance with the Commission's Material Specifications.

9. Annular space through floor shall be filled with 4000-PSI concrete

7.6.4 Water Services that Require Bypass

1. The Water Service Pipe that require a bypass shall be installed in accordance with the Sections 7.6.1 and 7.6.2 or 7.6.3 above and the following:
2. The Water Service Pipe for Combination Water Services or Customers that cannot have the water supply interrupted for meter maintenance may have a bypass installed around the meter. The proposed bypass piping arrangement shall be

submitted to the Commission's Engineering and Technical Services group for review and approval.

3. Typically, the bypass pipe may be one (1) pipe size smaller than the Water Service pipe.
4. A minimum of one (1) valve shall be installed on the bypass line.
5. For installations around a Meter Vault the bypass piping arrangement shall be installed in accordance with **Meter Vault Piping (W-13.0) and Large Meter Installation Detail (W-13.1)**.
6. For installations around a Meter in a building or basement the proposed bypass piping arrangement shall be submitted to the Commissions Engineering and Technical Services group for review and approval.

7.6.5 Fire Department Flush Test

1. The Springfield Fire Department requires a flush test on the fire service pipe to be performed by the Installer and observed by the Fire Department.
2. The Installer is responsible to schedule this test in addition to standard Commission testing requirements of flushing, leak testing, disinfection, and bacterial testing.
3. The Fire Department Flush may occur before the standard Commission testing.
4. The Fire Department may have additional requirements and should be contacted to ensure compliance.

Section 7.7 Water Meters

7.7.1 General

1. All material shall be in accordance with the Commission's Material Specifications.
2. The Owner's licensed plumber shall install all piping, fittings, and restraint within the building.
3. Prior to any work on a meter, a jumper wire shall be installed to prevent potential electrocution when the meter is removed for replacement or service.

   (a) The jumper shall be connected from the copper tube (CT) water service pipe to the house piping on the customer's side of the meter.

4. Commission supplies and installs all meters and meter couplings (meter spuds) at its expense.

5. The cost of supplying and installing any fittings, valves or meter horns required for the meter installation and the actual installation shall be at the Owners expense in Rates set forth in the Commission's Rules and Regulations.

6. The Owner shall supply and install all backflow prevention devices with detector check meters, utilized for fire services or other uses according to CHAPTER 10 of these Guidelines and Policies, at their expense.

7.7.2 Product Installation – 5/8-inch to 2-inch Water Meter

1. The 5/8-inch to 2-inch Water Meters shall be installed in accordance with the Sections 7.7.1 above and the following:

2. The meter can only be installed in a warm (continually above 45° F), clean, dry and accessible location.

3. The meter and meter valves shall have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor. The location provided for the meter shall be in accordance with **New Water Service Detail (W-11.0) or Replacement Water Service Detail (W-11.1).**

4. Where meters are installed in buildings constructed on a slab on grade the service entrance shall be in accordance with **New Water Service Detail (W-11.0) or Replacement Water Service Detail (W-11.1).** The meter and meter valves shall have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor.

5. The meters shall be installed in a horizontal position, unless otherwise approved by the Commission.

6. Meter coupling (meter spuds) nuts shall be sealed to the meter at both ends of the meter in accordance with **Water Meter Sealing Detail (W-11.2)**, as follows:

   (a) On the water main side of the meter; the meter shall be sealed with a wire that passes thru the meter coupling, the screw on the base plate, the meter cover, then to the meter coupling on the Customers side of the meter, and then back to the meter cover.

   (b) The two ends shall be sealed by a Commission meter installer or meter reader only.

7. When the meter cannot be installed in a building, a plastic meter pit shall be provided by the Owner in accordance with either Water Detail - Plastic Meter Pit

for 5/8-inch – 1-inch Meters (W-11.3) or Water Detail - Plastic Meter Pit for 1.5-inch – 2-inch Meters (W- 11.4).

(a) The plastic meter pit shall be located on the Owner's property in a non-traffic area, unless otherwise approved by the Commission.

(b) The plastic meter pit shall be HDPE or PVC plastic with an open bottom,

- 5/8-inch or 1-inch meter requires a 20-inch minimum diameter either smooth or corrugated, as approved by the Commission
- 1-1/2-inch or 2-inch requires a 36-inches minimum diameter corrugated

(c) The plastic meter pit shall be set on concrete blocks and a base of at least 6-inches of ¾-inch crushed stone.

(d) The top cover of the plastic meter pit shall be cast iron or ductile iron with a plastic inner lid and set flush to the existing grade.

(e) A copper meter setter (meter horn) shall be installed in the Plastic Meter Pit.

- The copper meter setter shall have male iron pipe (MIP) inlet and outlet.
- The copper meter setter shall have two (2) Ball Meter Valves - 90º Angle. For 5/8-inch through 1-inch meters either a ¾ or 1-inch meter swivel nut and for 1-1/2-inch and 2-inch meters an Elliptical flange in sizes 1-½-inch and 2-inch.
- The copper meter setter shall have K tube copper that shall be braced with PVC or copper tube.

(f) Before the meter is connected to the copper meter setter, the line shall be flushed clean at full pressure using the Ball Valve Curb Stop at the main in accordance with Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission. The service may be disinfected at the discretion of the Commission in accordance with Section 6.4.9 of these Guidelines and Policies. The trench shall be backfilled, compacted and the road patched as necessary. Care must be taken to protect the tubing from being damaged by backfilling, and to ensure the curb boxes are plumb, set at the correct grade, and centered over the valve.

7.7.3 Product Installation – 4-inch and Larger Water Meter

1. The meter can only be installed in a warm (continually above 45° F), clean, dry and accessible location.

2. When the meter cannot be installed in a building a concrete meter pit shall be provided and installed in accordance with **Large Meter Vault Piping Detail (W-13.0),** unless otherwise approved by the Commission.

3. Where meters are installed in meter Vaults, the meter shall be in accordance with accordance with **Large Meter Installation Detail (W-13.1),** unless otherwise approved by the Commission.

4. The meter and meter valves shall have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor. The location provided for the meter shall be in accordance with **Large Meter Vault Piping Detail (W-13.0) and Large Meter Installation Detail (W-13.1),** unless otherwise approved by the Commission.

5. Where meters are installed in buildings constructed on a slab on grade the service entrance shall allow the meter and meter valves to have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor.

6. The meters shall be installed in a horizontal position, unless otherwise approved by the Commission.

7. Only one (1) uni-flange is allowed and shall be installed on a plain end piece of pipe between the meter and the outlet OS&Y valve. All other connections shall be flanged connections, unless otherwise approved by the Commission.

7.7.4 Product Installation – Concrete Meter Vaults

1. Pre-cast Concrete Meter Vaults and all materials used in its construction and structures shall be constructed to the dimensions as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

2. Pre-cast Concrete Meter Vaults installed in the Commission's distribution system shall be provided in accordance with the Standard Meter Vault for Ductile Iron Water Service Pipe and Oversize Meter Vault for Ductile Iron Water Service Pipe Details (W-13.2 – 13.3), unless otherwise approved by the Commission.

3. Pre-cast Concrete Meter vaults may be either standard size at 10-feet long by 6-feet wide by 6-feet & 6-inches tall (inside dimensions) with 6-inch thick walls, floor, and roof or oversize at 12-feet long by 8-feet wide by 6-feet & 6-inches (inside dimensions) with 6-inch thick walls, floor, and roof in accordance with the Commission's Material Specifications. Before a meter vault is installed the developer shall submit the proposed meter vault to the Commissions Engineering and Technical Services group for review and approval.

(a) Standard Vault size may be used for 4-inch through 8-inch single supply Water Service, multiple supply Water Service, and single supply Combination Water Service.

(b) Oversize Vault may be used for any 8-inch through 12-inch single supply or multiple supply Water Service or Combination Water Service if it is determined during the review process more space is needed.

(c) All Fire Services shall be installed above grade in a heated enclosure or in a heated basement or building. Below grade vaults for Fire Services are not allowed.

4. Pre-cast Concrete Meter Vaults shall be installed on the Owner's property.
5. Outside/exterior surfaces of Pre-cast Concrete Meter Vaults shall be painted with two coats of bituminous damp proofing at the rate of 30 to 60 sq ft per gallon, in accordance with manufacturer's instructions.
6. Pre-cast Concrete Meter Pit bases shall be placed on a bed of 12-inches of crushed stone ¾-inch. Meter Pit base grades shall be set so that any required grade adjustment to bring the manhole frame and cover to final grade does not exceed 8-in.
7. All work shall be protected at all times against flooding and/or flotation.
8. Pre-cast Concrete Meter Vaults shall be set plumb with a 1/4-in maximum out of plumb tolerance allowed.
9. Jointing of Pre-cast Concrete Meter Vaults shall be accomplished with butyl rubber joint sealant gasket in accordance with the Commission's Materials Specifications installed at the shiplap joints of each section, unless otherwise approved by the Commission.

   (a) All installation surfaces shall be clean and dry.

   (b) Apply one (1) continuous bead of sealant around the periphery of the joint by pressing the bead firmly into place. Remove backing paper as the installation progresses.

   (c) Use of primer is required when temperatures are below 40-degrees F and/or the concrete is damp.

   (d) Extremely wet conditions require the installation to have two (2) beads applied in the same manner as above.

10. Joints shall be allowed to set for at least 14 hours before backfilling unless a shorter period is specifically approved by the Commission or its representative.

11. Holes required for handling in the concrete barrel sections shall be plugged with a non-shrinking grout, or concrete plugs in combination with non-shrinking grout. Finish flush on the inside.

12. Pre-cast Meter Vaults shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter) in accordance with the **Large Meter Installation Detail (W-13.1)**.

13. Integrally cast knockout panels shall be provided at locations in accordance with the Standard Meter Vault for Ductile Iron Water Service Pipe (W-13.2) and Oversize Meter Vault for Ductile Iron Water Service Pipe Details (W-13.3). Sizes shall be adequate for intended pipe sizes. Knockout panels shall have no steel reinforcing.

14. When pre-formed hole are not provided the holes in Pre-cast Meter Vaults shall be cut to accommodate pipes prior to setting manhole sections in place to prevent jarring that may loosen the mortar joints.

15. Connections into the manhole shall be grout in place. The non-shrink grout shall be installed around the pipe connection where a formed, tapered circular opening is larger than the pipe outside diameter.

16. Backfill shall be laid and compacted carefully and evenly around Pre-cast Meter Vaults.

17. The Commission will visually inspect Pre-cast Meter Vaults after the backfill is in place. The inside of any leaking Pre-cast Meter Pit joint shall be caulked with lead wool or non-shrink grout to the satisfaction of the Commission or its representative.

18. All concrete work performed inside the Pre-cast Meter Pit shall be finished smooth and swept clean before acceptance by the Commission.

7.7.5 Product Installation - Manhole Frame and Cover:

1. Manhole frame and covers shall be installed in accordance with Large Meter Vault Piping Detail (W-13.0), Standard Meter Vault for Ductile Iron Water Service Pipe (W-13.2), and Oversize Meter Vault for Ductile Iron Water Service Pipe Details (W-13.3), unless otherwise approved by the Commission.

2. Pre-cast concrete grade rings and/or brick and non-shrink mortar shall be used to adjust manhole frame and cover to final grade.

3. The inside and outside of pre-cast concrete grade rings and/or brick shall be sealed with hydraulic cement.
4. Under no circumstances shall barrel blocks be allowed.
5. Castings shall be set in non-shrink grout. Non-shrink grout shall be placed all around casting to 4-inches above flange.
6. Castings shall be thoroughly cleaned and subject to hammer inspection.
7. All brick and mortar dropped into manhole if the finished invert is built before the frame and covers are installed shall be cleaned and removed.

Section 7.8 Removal of Existing Materials and Parts from Customers Homes, Businesses and/or Underground Infrastructure

7.8.1 Ownership

1. All service valves at the meter, service pipes, hydrants, and gate valves on the service pipes, and/or any other parts on the service pipes are solely the Customer's property.
2. Any service valves at the meter, service pipes, hydrants, gate valves on the service pipes, and/or any other parts on the service pipes that are removed from a customer's property, with the Customer's permission, shall become property of the Commission.
3. All service valves at the main and meters are solely the Water and Sewer Commission's property.
4. Any service valves at the main and meters that are removed from a Customer's property, shall remain property of the Commission.
5. Under no circumstances shall a Commission employee be allowed to keep any parts and/or materials removed from a home, business, or underground infrastructure during hours of employment and/or during the use of a Commission vehicle.

7.8.2 Handling

1. In the event that a customer service valve in the building is being replaced and/or repair is performed on the underground infrastructure, as part of the Commission's work, the Commission employee must ask the customer if they wish to keep the service valve other material or if they prefer the Commission to dispose of the parts and/or materials.

2. Any service valves, service pipes, meters, main pipes, gate valves, hydrants, valve box, service box and any other parts or materials that the customer does not wish to keep must be returned to the Field Services Office at 71 Colton Street.

3. In the event that the customer request that the Commission dispose of the parts and/or materials, the employee must document the request and return all parts and/or materials to the Field Services Office at 71 Colton Street.

4. Under no circumstances, will any Commission employee be allowed to enter any recycling and/or scrap metal facility (junkyard, scrap metal, recycling, etc.) with a Commission vehicle without authorization from the Executive Director or his/her designee.

Section 7.9 Terms of Warranty on Installation

7.9.1 General -

1. The Owner will be held responsible for the repair of any service or main leaks up to one (1) year after the successful pressure testing and disinfection has been accepted by the Commission Engineering Services Department.

2. The Owner will have the opportunity to make repairs at his cost under the direction of Commission field inspector, or any leaks will be repaired by Commission and the cost of such repairs will be at the owner's expense.

3. The Owner will be responsible for the repair or correction of trench settlement. Commission retains the right to repair the settlement and the cost of repairs will be charged to the Owner.

Springfield Water and Sewer Commission

Guidelines and Policies

CHAPTER 8 PAVEMENT

Section 8.1 General

1. Bituminous paving installed in the Commission's water distribution systems in Springfield and Ludlow and the sewer collection system in Springfield shall be in accordance with the following details:

   (a) Paving repairs and/or installations in Ludlow that require flowable fill as backfill shall be installed in accordance with **Trench Backfilling – Method 1 for Ludlow Roadways Detail (W-02.1)**, unless otherwise approved by the Town of Ludlow Department of Public Works (DPW) and the Commission.

   (b) Paving repairs and/or installations in Ludlow that require compacted common borrow fill as backfill shall be installed in accordance with **Trench Backfilling – Method 2 for Ludlow Roadways Detail (W-02.2)**, unless otherwise approved by the Town of Ludlow DPW and the Commission.

   (c) Paving repairs and/or installations in Springfield on arterial streets shall be installed in accordance with **Trench Backfilling – Method for Arterial Streets in Springfield (W-02.3)**, unless otherwise approved by the City of Springfield Department of Public Works (DPW) and the Commission.

   (d) Paving repairs and/or installations in Springfield on residential streets shall be installed in accordance with **Trench Backfilling – Method for Residential Streets in Springfield (W-02.4)**, unless otherwise approved by the City of Springfield DPW and the Commission.

2. Bituminous paving repairs and all materials used in the construction and structures shall be constructed to the dimensions shown on the Design Drawings, as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

3. Typically, temporary or binder coarse bituminous pavement shall be installed at the end of each work week on all Commission Construction Crew or Installer installed water main, sewer main, water service, and/or building sewer connection in Ludlow or Springfield, unless otherwise approved by the appropriate DPW and the Commission.

4. Approximately, 90-days after the last temporary or binder coarse of bituminous paving has been in place on a project the Commission Construction Crew or Installer shall mill the appropriate width and depth of existing paving and temporary or binder paving, unless otherwise approved by the appropriate DPW and the Commission.

5. The mill surface shall be tack coated prior to the final pavement being installed.
6. The final paving or top coarse shall be installed the full width and depth of the milled area.
7. All water valve boxes, water services boxes, sewer manholes, and/or structures in the area of pavement installation shall be raised to finish grade prior to the installation of any paving, unless otherwise approved by the appropriate DPW and the Commission..

Section 8.2 Springfield

8.2.1 Permanent Bituminous Concrete Patch: Residential in Springfield: 3-inch Or Less in Depth

1. In addition to the General, requirements of this Section the work shall be performed in accordance with Springfield Department of Public Works Pavement Restoration Requirements.
2. Restoration work shall be scheduled and inspected in accordance with Springfield Department of Public Works Standard Procedures.
3. The Commission designated Inspector shall also be notified by written schedule submitted thru the Deputy Director of Field Services at the Commission Customer Field Service Building, 71 Colton St., Springfield MA, Fax Number is 413-787-7975.

8.2.2 Permanent Bituminous Concrete Patch: Arterial in Springfield: More Than 3-inch in Depth, But Not Greater Than 6-inch in Depth

Items found in Section 8.2.1 of these Guidelines and Policies, numbered 1 thru 3 apply here.

Section 8.3 Ludlow

8.3.1 Permanent Bituminous Concrete Patch: Residential in Ludlow: 3-inch Or Less in Depth.

1. In addition to the General, requirements of this Section the work shall be performed in accordance with Ludlow Department of Public Works Pavement Restoration Requirements.
2. Restoration work shall be scheduled and inspected in accordance with Ludlow Department of Public Works Standard Procedures.

3. The Commission designated Inspector shall also be notified by written schedule submitted thru the Deputy Director of Field Services at the Commission Customer Field Service Building, 71 Colton St., Springfield MA, Fax Number is 413-787-7975.

8.3.2 Permanent Bituminous Concrete Patch: Arterial in Ludlow: More Than 3-inch In Depth, But Not Greater Than 6-inch In Depth

Items found in Section 8.3.1 of these Guidelines and Policies, numbered 1 thru 3 apply here.

8.3.3 Bituminous Concrete Sidewalk or Driveway Restorations: Type I, Surface Course

1. Sidewalk and Driveway Bituminous surfaces that are disturbed shall be restored, full width, in kind, a minimum of one foot beyond the disturbed area.
2. After the sub-grade has been prepared, a foundation of gravel shall be placed upon it. After thorough mechanical compaction to at least 95% modified proctor density, the foundation of gravel shall at least 8-inch thick.
3. The bituminous concrete sidewalk or driveway surface shall be laid in 2 courses to a depth-after rolling of 3-inch. The bottom course shall be 1-½-inch and its surface after rolling shall be 1-½-inch below the parallel to the proposed grade of the finished surface. The top course shall be 1-½-inch thick after rolling.
4. The existing vertical surfaces of bituminous concrete shall be thoroughly cleaned, and tack coated before placing new, hot bituminous concrete.
5. After rolling the top course, the edges of the permanent bituminous concrete patch shall be sealed with liquid asphalt emulsion (AASHTO M140) and coated with sand.
6. Bituminous concrete mixtures shall be distributed by direct dumping, wheelbarrow, or other approved means into the area to be patched. It shall then be immediately distributed into place by means of shovels and raked into a uniformly loose layer to the full width required and of such depth that, when work is completed, it shall conform to the grade and surface contour required. An approved mechanical spreader may be used.
7. Surfaces shall be rolled with a self-propelled tandem roller with a mass of a minimum 3 tons. In places where a power roller cannot be used, compaction shall be obtained by mechanical rammers or by hand tampers.
8. Where walls, curbing or other suitable permanent supports are not present, or where an approved mechanical spreader is not used, satisfactory forms shall be

installed to assist in securing proper alignment and adequate compaction of the base and surface courses.

Springfield Water and Sewer Commission

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Section 8.4 Water Valve Box and Service Box Adjustment and Replacement

8.4.1 General

This Policy is intended to be used, by either the Springfield Department of Public Works or the Ludlow Department of Publics Works for paving improvement projects within the respective City or Town boundaries.

The following section should be included as a bid alternate in a contract bid document. The following section includes six (6) items the Commission would be responsible for paying for, at its sole discretion.

If the Commission were not to choose to use the bid alternate it would then adjust or replace the valve and services boxes with its own employees.

8.4.2 Commission Valve and Service Box Adjustment and Replacement Policy

The Contractor shall notify in writing the Springfield Water and Sewer Commission for field location of water mains and valves. All valves shall be operated by Springfield Water and Sewer Commission employees only. Springfield Water and Sewer Commission personnel shall inspect all work on water mains and valves. All gate and service boxes are property of the Springfield Water and Sewer Commission.

The Springfield Water and Sewer Commission shall identify all structures, which are to remain, be raised or lowered, removed and reset, or removed and replaced with new structure.

Work done by a Contractor shall include the locating and recording in a field book of all Springfield Water and Sewer Commission valves lowered or removed during construction. This book shall be available to the Resident Engineer and become property of the Springfield Water and Sewer Commission.

The Contractor shall be held responsible for the protection of all castings. The Contractor at his expense shall replace any water boxes damaged in any manner during the progress of construction with new castings.

No water box shall remain exposed without suitable maintenance for the safety of the traveling public.

Before final payment is made, the Springfield Water and Sewer Commission will inspect all work to ensure that all boxes are centered over the appurtenance that they supply access to, and that they are straight and clean.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks,

cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Springfield Department of Public Works or Ludlow Department of Public Works (Department of Publics Works), and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's Guidelines and Policies and Material Specifications at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 1 GATE BOX REMOVED AND RESET EA

Cost of these items shall include, but not be limited to, removing the existing gate box top, gate box bottom, and gate box cover by excavating to expose the structures, carefully removing the structures, resetting the undamaged structures, and backfilling the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall

agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 1a GATE BOX ADJUST EA

Cost of these items shall include, but limited to, removing the existing material around the existing box top to a depth of 6" below the existing grade. Pry up the box top to the proposed finish grade. Pour a concrete collar (4,000 psi minimum mix) around the adjusted box top and up to the flange of the box top and finish the collar to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 2 GATE BOX REMOVED AND STACKED EA

Cost of these items shall include, but not be limited to, removing the existing gate box top, gate box bottom, and gate box cover by excavating to expose the structures, and carefully removing the structures.

All removed and stacked gate boxes shall be brought to a location determined by the Springfield Water and Sewer Commission. If the Springfield Water and Sewer

Commission determines that the removed materials are not suitable, the Contractor shall discard the removed materials properly. All related costs to discard this material will be included in this item.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 3 NEW GATE BOX INSTALLED EA

Cost of these items shall include, but not be limited, supplying the valve box that meets the Springfield Water and Sewer Commission's Specifications. Valve boxes shall be installed concentric to the operating nut and plumb with the vertical plane. The belled base section shall be placed on blocking in such a way that no additional loading is transferred to the valve. Longer valve box bottoms and/or tops will be specified as required for water mains at depths that exceed the limitations of the above specified valve box. Valve boxes located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified. Valve boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. Valves and boxes shall be set with the stem vertical and valve box vertically centered over the operating nut. The valve box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The Valve Box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

Springfield Water and Sewer Commission

Guidelines and Policies

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

These provisions in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 3a NEW GATE BOX TOP INSTALLED EA

SWSC will supply the casting needed for this Item. Cost of these items shall include, but not be limited to valve boxes installed concentric to the operating nut and plumb with the vertical plane. Valve boxes located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified. Valve boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. Valves and boxes shall be set with the stem vertical and valve box vertically centered over the operating nut. The valve box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The Valve Box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair

or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 4 NEW SERVICE BOX INSTALLED EA

Cost of these items shall include, but not be limited, supplying the service box that meets the Springfield Water and Sewer Commission's Specifications. Service box bases shall be centered over the curb stop ball valve and shall be plumb and vertical in all directions. The box bottom shall be placed on the same blocking or flat surface as the curb stop. Service boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. The service box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The service box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall

agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 4a NEW SERVICE BOX TOP INSTALLED EA

SWSC will supply the casting needed for this Item. Cost of these items shall include, but not be limited to service boxes centered over the curb stop ball valve and shall be plumb and vertical in all directions. Service boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. The service box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The service box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 5 SERVICE BOX REMOVED AND RESET EA

Cost of these items shall include, but not be limited to, removing the existing service box top, service box bottom, and service box cover by excavating to expose the

structures, and carefully removing the structures, resetting the undamaged structures, and backfilling the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 5a SERVICE BOX ADJUST EA

Cost of these items shall include, but limited to, removing the existing material around the existing box top to a depth of 6" below the existing grade. Pry up the box top to the proposed finish grade. Pour a concrete collar (4,000 psi minimum mix) around the adjusted box top and up to the flange of the box top and finish the collar to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM6 SERVICE BOX REMOVED AND STACKED EA

Cost of these items shall include, but not be limited to, removing the existing service box top, service box bottom, and service box cover by excavating to expose the structures, and carefully removing the structures.

All removed and stacked service boxes shall be brought to a location determined by the Springfield Water and Sewer Commission. If the Springfield Water and Sewer Commission determines that the removed materials are not suitable, the Contractor shall discard the removed materials properly. All related costs to discard this material will be included in this item.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

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Please provide quote to perform each of the above items below:

ITEM 1	**GATE BOX REMOVED AND RESET**	**$**	**EA**
ITEM 1a	**GATE BOX ADJUST**	**$**	**EA**
ITEM 2	**GATE BOX REMOVED AND STACKED**	**$**	**EA**
ITEM 3	**NEW GATE BOX INSTALLED**	**$**	**EA**
ITEM 3a	**NEW GATE BOX TOP INSTALLED**	**$**	**EA**
ITEM 4	**NEW SERVICE BOX INSTALLED**	**$**	**EA**
ITEM 4a	**NEW SERVICE BOX TOP INSTALLED**	**$**	**EA**
ITEM 5	**SERVICE BOX REMOVED AND RESET**	**$**	**EA**
ITEM 5a	**SERVICE BOX ADJUST**	**$**	**EA**
ITEM 6	**SERVICE BOX REMOVED AND STACKED**	**$**	**EA**

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Section 8.5 Sewer Manhole Frame and Cover Adjustment and Replacement

8.5.1 General

This Policy is intended to be used, by the Springfield Department of Public Works for paving improvement projects within the City boundaries.

The following section should be included as a bid alternate in a contract bid document. The following section includes three (3) items the Commission would be responsible for paying for at its sole discretion.

If the Commission were not to choose to use the bid alternate it would then adjust or replace the manhole frame and covers with its own employees.

8.5.2 Commission Sewer Manhole Frame and Cover Adjustment and Replacement Policy

The Contractor shall notify in writing the Springfield Water and Sewer Commission for field location of Sewer Manhole Frames and Covers. Springfield Water and Sewer Commission personnel shall inspect all work on Sewer Manhole Frames and Covers. All Sewer Manhole Frames and Covers are property of the Springfield Water and Sewer Commission.

The Springfield Water and Sewer Commission shall identify all structures which are to remain, be raised or lowered, removed and reset, or removed and replaced with new structure.

Work done by a Contractor shall include the locating and recording in a field book of all Springfield Water and Sewer Commission valves lowered or removed during construction. This book shall be available to the Resident Engineer and become property of the Springfield Water and Sewer Commission.

The Contractor shall be held responsible for the protection of all castings. The Contractor at his expense shall replace any water boxes damaged in any manner during the progress of construction with new castings.

No Sewer Manhole Frames and Covers shall remain exposed without suitable maintenance for the safety of the traveling public.

Before final payment is made, the Springfield Water and Sewer Commission will inspect all work to ensure that all Sewer Manhole Frames and Covers are centered over the appurtenance that they supply access to, that they are straight and clean, and are set to finish grade.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks,

cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Springfield Department of Public Works (Department of Publics Works), and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's Guidelines and Policies and Material Specifications at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 7 SEWER MANHOLE FRAME AND COVER REMOVED AND RESET EA

Cost of these items shall include, but not be limited to, removing the existing sewer manhole frame and cover by excavating to expose the structures, carefully removing the structures, storing and securing the frame and cover, maintaining the manhole during milling operations, resetting the undamaged structures with the appropriate courses of leveling bricks and mortar, sealing the leveling courses with hydraulic cement, and backfilling the structures with 4-inches of non-shrink grout above the flange of the structure. Invert table must be cleaned of all bricks chips and mortar before payment will be made.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and

Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 8 SEWER MANHOLE FRAME AND COVER REMOVED AND STACKED EA

Cost of these items shall include, but not be limited to, removing the existing sewer manhole frame and cover by excavating to expose the structures, carefully removing the structures, and maintaining the structure during milling operations.

All removed and stacked sewer manhole frames and covers shall be brought to a location determined by the Springfield Water and Sewer Commission. If the Springfield Water and Sewer Commission determines that the removed materials are not suitable, the Contractor shall discard the removed materials properly. All related costs to discard this material will be included in this item.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

ITEM 9 SEWER MANHOLE FRAME AND COVER INSTALLED EA

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Cost of these items shall include, but not be limited, supplying the new sewer manhole frame and cover that meets the Springfield Water and Sewer Commission's Specifications. Sewer manhole frames and covers shall be installed and set with the appropriate courses of leveling bricks and mortar, sealing the leveling courses with hydraulic cement, and backfilling the structures with 4-inches of non-shrink grout above the flange of the sewer manhole frame and cover. Sewer manhole frames and covers located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified. Sewer manhole frames and covers located in other non-paved areas shall be left flush with finish grade unless otherwise specified. Invert table must be cleaned of all bricks chips and mortar before payment will be made.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

Please provide quote to perform each of the above items below:

ITEM 7 SEWER MANHOLE FRAME AND COVER

REMOVED AND RESET $ EA

ITEM 8 SEWER MANHOLE FRAME AND COVER

REMOVED AND STACKED $ EA

ITEM 9 SEWER MANHOLE FRAME AND COVER INSTALLED $ EA

Springfield Water and Sewer Commission

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CHAPTER 9 WATER PUMP STATIONS

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CHAPTER 10 CROSS CONNECTION DEVICES

Section 10.1 General

1. Cross Connection Devices provided to the Springfield Water and Sewer Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with the Commission's Material Specifications.

2. The Cross Connection Devices shall conform to AWWA C-510 (most current revision) Standard for Double Check Valve Backflow Prevention Assembly and/or AWWA C-511 (most current revision) Standard for Reduced Pressure Principle Backflow Preventer.

   (a) Devices are the back flow preventer only.

   (b) Assemblies are from the manufacturer and include two isolation valves and the back flow preventer.

3. The Commission will determine the degree of hazard and type of back flow preventer required. The Owner shall hire a professional engineer to determine the size and flow capacity of the backflow preventer. The engineer or a fire suppression firm shall design the back flow preventer installation in accordance with the design engineer's requirements and theses Guidelines and Policies.

4. Depending on the degree of health hazard the acceptable types of back flow prevention devices that may be installed for backflow prevention shall include air gap separation, reduced pressure zone backflow preventers, double check valve assemblies, atmospheric or pressure vacuum breakers, backflow preventers with intermediate atmospheric vents, and barometric loops.

   (a) Degree of health hazard shall be as set forth in Massachusetts Drinking Water Regulations 310 CMR 22.22.

   (b) List of locations that require approved BFP devices installed at the meter along with in plant protection at the point of use shall be as follows:

   - Nuclear reactors or other facilities where radioactive materials are used;
   - Sewage treatment plants and sewage pumping stations;
   - Piers, docks, marinas, shipyards;
   - Chemical plants;
   - Metal plating industries;
   - Hospitals, mortuaries, medical clinics, dental offices and clinics;

- Laboratories, except when the Massachusetts Department of Environmental Protection (MDEP) or its Designee has made a specific determination that no health hazard exists on the premises and;
- Other types of facilities as determined in writing by the MDEP or its Designee.

5. If continuous Water Service is necessary, two approved Backflow Prevention Devices shall be installed in a parallel installation, so that Water Service will not be interrupted during testing and maintenance operations.

   •

6. Backflow Prevention Devices and assemblies shall be installed in a horizontal position at least three (3) to four (4) feet above the floor, eighteen (18) inches from any wall, ceiling, or other device and with clear access to the BFP device without any obstructions.

7. Tightly closing shut off valves end shall be installed at each end of the BFP device, unless otherwise approved by the Commission.

8. All metered installations such as, but not limited to, process plants, Commercial Customers, Industrial Customers and/or Combination services require the following connections:

   (a) Less than 2-inch services shall have a Commission meter valve in accordance within accordance with the **New or Replacement Service Details (W-11.0 and 11.1)**

   (b) 4-inch and larger assemblies after the flange entering the building shall have a building control valve that is a flange by flange (F x F) outside spindle and yoke (OS&Y) gate valve that is in accordance with the Commission's Material Specifications.

   (c) 4-inch and larger services shall have a F x F and OS&Y gate valves on the inlet and outlet sides of the meter, pressure reducing valve, and the BFP device in accordance with the **Typical Ductile Iron Commercial and Industrial Service Details through Foundation Wall or Floor Details (W-13.14 or 13.15)**.

   (d) The device shall have F x F connections on the inlet and outlet side of the device.

   (e) The inlet and outlet sides of the device shall have F x F OS&Y gate valves on each side.

9. Fire suppression systems shall have assemblies installed as follows:

(a) Less than 2-inch shall have a Commission meter valve in accordance with the **New or Replacement Service Details (W-11.0 and 11.1)** and after the meter valve may have the device or assembly with ball valves or butterfly valves.

(b) Less than 2-inch the assembly valves and device may have threaded connections.

(c) 4-inch and larger assemblies after the flange entering the building shall have a building control valve that is an F x F OS&Y gate valve in accordance with the **Typical Ductile Iron Fire Service Details through Foundation Wall or Floor Details (W-13.11 or 13.12)**.

(d) An assembly or device with inlet and outlet shut-off valves shall be installed downstream of the building control valve.

(e) 4-inch and larger valves and devices may have all flange or grooved (Victaulic) connections, or some combination of both.

(f) All shut off valves for the device shall have tamper switches and open close indicators.

10. For all flange connections the connection hardware shall be 304 stainless steel which includes the bolt, nut, and two flat washers.

11. For grooved connections, the hardware may be heat-treated plated carbon steel, track head meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.

12. When the device or assembly is provided with a drain, the drain shall exit facility and shall not be connected to sewer.

13. Metered Services and Fire Services shall be tested in accordance with Section 4.5.4 of these Guidelines and Policies.

14. After testing is complete and the approved device or assembly is onsite and ready to install then the blank flange and ball valve used for testing may be removed and the shut-off valves and device or assembly may be installed.

15. The Backflow Prevention Devices shall be protected from freezing, flooding, mechanical damage, vandalism, shall be easily accessible, and shall not have any stored goods, merchandise, materials, refuse, or installed equipment in a manner that will obstruct testing, inspection, and maintenance purposes unless otherwise approved by the Commission.

16. Installation of a Backflow prevention device below grade in a pit or chamber is prohibited unless approved by the Commission and installed as provided in 310 CMR 22.22.

    (a) It is preferable that all Back Flow Prevention Devices be installed above grade, in buildings according to this Section of the Commission's Guidelines and Policies.

    (b) When a Back Flow Prevention Device cannot be installed inside a building then it shall be installed above grade, in a heated enclosure in accordance with the **Typical Ductile Iron Fire Service Detail in a Hot Box (W-13.13)**.

    (c) For seasonal services such as irrigation systems the enclosure may be unheated provided there is a maintenance plan to prevent the meter from freezing.

    (d) Enclosures shall be set on concrete pads

    - 2-inch and smaller copper tube services the concrete pad shall be 5-feet long, 3-feet wide, and 6-inches thick with 3-inch sleeves on each end centered on the pad and 6-inches from each end.
    - For 4-inch and larger ductile iron water services or fire services
    - For 4-inch and larger ductile iron water services the pad shall be 6-inches larger than the required enclosure and as thick as the manufacturer requires.
    - All pads shall have the top surface at least 2-inch above finish grade and sloped outwards.
    - The enclosure shall be anchored to the pad with a minimum of four (4) 3/8-inch by 5-inch L anchors.

    (e) Enclosures shall be provided in accordance with the SWSC's Material Specifications.

Section 10.2 Acceptance of Backflow Preventers

10.2.1 Turn-ons

1. Water Services or Fire Services, other than Residential, shall not be Turned-on until they are inspected by the Commissions Cross Control Inspectors in accordance with Section 4.5 of these Guidelines and Policies, unless otherwise approved in writing by the Cross Connection Inspector.
2. Water Services and Fire Services shall only be Turned-on by a Commission employee after the Cross Connection Inspector has approved the Backflow Preventer.

Springfield Water and Sewer Commission

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CHAPTER 11 SEWER MAINS AND APPURTENANCES

Section 11.1 Control of Work

11.1.1 General

1. Failure to meet the requirements of these Guidelines and Policies and/or the Material Specifications for materials may result in removal of the pipe, fittings, and/or appurtenances from the construction site and the rejection of its use by the Commission.
2. The new or proposed sanitary sewer main shall be located in the street in accordance with **Utility Separation Detail (W-01.0)**.
3. The new or proposed sanitary sewer main shall be bedded and installed in accordance with the **Trench Detail (S-01.0)**.
4. Collection system sewer pipe shall be at least 8-inches in diameter, shall be Polyvinyl Chloride (PVC) Gravity Pipe as specified in the Commission's Material Specifications unless otherwise approved by the Commission's Engineering and Technical Services.
5. Pipe used for building sewer pipe shall be at least 6-inches in diameter, shall be PVC Gravity Pipe as specified in the Commission's Material Specifications unless otherwise approved by the Commission's Engineering and Technical Services.
6. All pipe furnished shall be either in 13-foot, 18-foot, or 20-foot lengths, unless otherwise approved by the Commission.
7. All pipe and fittings furnished shall be clearly marked on the outside indicating name, manufacturer, nominal diameter, ASTM, schedule, and/or pipe or pressure class designation.
8. Typical collection system sewer pipe and building sewer pipe installations shall be as follows, unless otherwise approved by the Commission:

   (a) Collection system sewer pipe and building sewer pipe with less than 4-feet of cover shall be insulated cement lined thickness class 52 ductile iron pipe, bitumastic coated inside and out and as specified in the Commission's Material Specifications. Commission approval is required prior to the installation of sewer main with less than 4-feet of cover.

   (b) Collection system sewer pipe and building sewer pipe 4-feet to 15-feet of cover: shall be PVC standard dimension ration (SDR) 35 minimum, with a minimum pipe stiffness of 46 PSI. Pipe up to 15-inches in diameter shall

conform to ASTM 3034 and pipe 18-inches in diameter or larger shall conform to ASTM F679, and as specified in the Commission's Material Specifications, unless otherwise approved by the Commission.

(c) Collection system sewer pipe and building sewer pipe deeper than 15-feet, but less than 30-feet deep: shall be PVC SDR 26 thick wall minimum, with a minimum pipe stiffness of 115 PSI. Pipe up to 15-inches in diameter shall conform to ASTM 3034 and pipe 18-inches in diameter or larger shall conform to ASTM F679, and as specified in the Commission's Material Specifications, unless otherwise approved by the Commission.

(d) Collection system sewer pipe and building sewer pipe deeper than 30-feet: shall be approved by the Commission prior to installation.

9. Other pipes for Collection system sewer pipe and building sewer pipe installation that are acceptable to the Commission, but must be approved for use, are as follows:

   (a) Ductile Iron Pipe (DIP) as specified in the Commission's Material Specifications for water main installation and in CHAPTER 6 of these guidelines and Policies.

   (b) Reinforced Concrete Pipe (RCP) as specified in the Commission's Material Specifications.

   (c) High Density Polyethylene Pipe (HDPEP) as specified in the Commission's Material Specifications.

10. All pipes for collection system sewer pipe and building sewer pipe installation shall be the same material from manhole to manhole and/or building to main.

11. All pipes shall be laid at the grade, depth, and as indicated on the approved plans. Inspections cannot take place unless a set of approved plans are at the construction site.

12. Manholes shall be in accordance with Pre-cast Concrete Sewer Manhole and Pipe Connection Details (S 02.0, S-02.1, S-02.2, S-02.3, S-02.4, and S-02.5).

13. When new or proposed sanitary sewer main or other utility crosses a water main or other utility requiring protection, the main shall be encased in concrete and installed in accordance with the Utility Crossing Detail (S-03.0), unless otherwise approved by the Commission.

14. Commission Construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.

15. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

11.1.2 Labor, Materials, and Equipment

1. The Installer shall furnish labor, materials, and equipment that is appropriate to accomplish quality work in an efficient and timely manner. Sufficient resources must be committed to the work to ensure a rate of progress that will enable completion within established timelines.
2. All equipment requiring special licenses shall be operated only by persons who possesses a current, valid license for that piece of equipment

11.1.3 Private Land

1. The Commission Construction Crew or Installer will have to enter private land and private residences in order to accomplish the work. The Commission Construction Crew or Installer shall plan the work to ensure the Owner or the Owner's authorized representative is on site to permit the Commission Construction Crew or Installer and his/her employee's access to the premises.
2. The Commission Construction Crew or Installer must ensure that premises are left neat and clean after job completion.
3. In most homes and businesses, the Commission Construction Crew or Installer must take all necessary precautions to ensure that theft or damage does not occur during work activities.

11.1.4 Supervision

1. The Installer shall have, on site, at all times during the work activities, a full time competent Foreman who shall be in charge of the project. This Foreman shall be the agent for the Installer on site, and shall coordinate inspections, record keeping, future work, and other issues with the Field Inspector assigned by the Commission to okay and inspect the work.
2. The Installer shall notify the Commission in writing whenever there is a change in Foremen.

11.1.5 Existing Underground Utilities and Structures

1. The Commission Construction Crew or Installer shall refer to Section 5.3 of these Guidelines and Policies for more information concerning DIG SAFE.

2. The Commission Construction Crew or Installer shall determine the location or absence of all underground utilities, and plan and conduct his work operations to ensure that those utilities shall not be damaged.

3. The Commission Construction Crew or Installer shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, and services to buildings, mail boxes, utilities, gas pipes, water pipes, hydrants, sewers, drains, and cables, whether on private or public property.

4. Any damage resulting from the Installer's operations shall be repaired at the Installer's expense.

11.1.6 Delivery, Storage, and Handling

1. New pipe, fittings, and other appurtenances shall be delivered to the construction site as close in time to installation as possible.

2. All pipe shall be shipped with lifts separated by work separators such that, pipe to pipe contact is prevented during the transit and/or storage of the pipe.

3. Care shall be taken during the loading, trucking, unloading and handling of all pipe, fittings, and other appurtenances so as not to damage the materials or surrounding area.

   (a) Pipe, fittings, and other appurtenances shall not be dropped directly from the truck to the ground.

   (b) The Commission's Construction Crew or Installer is responsible for any pipe, fittings, and other appurtenances damaged during delivery, handling or storage.

   (c) A pipe clamp with protective coating is a preferred means to handle pipe, but forks may be used during the unloading process provided care is taken not to damage the pipe. Forks shall not be used in the interior of the pipe to handle pipe.

   (d) All damaged materials will be removed from the site immediately.

4. All pipe, fittings, and other appurtenances shall be stored in a manner that prevents water on the ground and / or animals from entering the material and prevent damage to the material and / or others' property.

5. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a boom, straps, or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings or linings.

(a) Under no circumstances shall chains be used or material be dropped or dumped into trench.

(b) Use of forks to handle pipe at construction sites is not allowed,

6. Pipe may not be strung along the line of work unless approved by a Commission representative. Materials must be stored in such a manner that it does not obstruct driveways, sidewalks, etc.

7. All pipe, fittings, and other appurtenances shall be stored in a manner that prevents water on the ground (run-off or puddles), debris, and/or animals from entering the material and prevent damage to the material and/or others' property.

   (a) Pipe may not be strung along the line of work unless approved by a Commission representative.

   (b) Materials must be stored in such a manner that it does not obstruct driveways, sidewalks, etc.

   (c) The Installer shall contact the Department of Public Works having jurisdiction to determine if it is permitted to string materials along the roadway of the work.

   (d) Materials that have had water, debris, and/or animals will be removed from the site.

8. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a boom, straps, or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings or linings.

   (a) Under no circumstances shall chains be used, or material be dropped or dumped into trench.

   (b) Use of forks to handle pipe at construction sites is not allowed. Unless approved by the Commission.

11.1.7 Trenching

1. Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission's Health and Safety Policies.

2. Do not lay or embed pipe in standing or running water. At all times, prevent runoff and/or surface water from entering trench.

3. When ground water is present in the work area, dewater trench area to maintain stability of existing trench and imported materials. The water level shall be

maintained below pipe bedding and foundation of the trench to provide a stable trench bottom. Use, as appropriate, sump pumps, well points, deep wells, geo-fabrics, perforated under-drains, or stone blankets of sufficient thickness to remove and control water in the trench. Maintain and control water in the trench before, during, and after the pipe installation, until the embedment is installed and sufficient backfill has been placed to prevent flotation of the pipe.

4. Where trench walls are stable, or support is provided the minimum trench width shall be no greater than needed to perform the work properly and safely. The space between the trench wall and pipe shall be wider than the compaction equipment to be used in the pipe zone. Minimum trench width shall be the greater of: (1) 16-inches plus the diameter of the pipe installed or (2) the pipe diameter times 1.25 plus 12-inches.

5. When supports, such as those required in CHAPTER 5 of these Guidelines and Policies, are used then support of the pipe and embedment shall be maintained throughout the installation. The support shall be kept tight to against the trench wall to ensure the trench wall does not wash out.

6. When required by the Commission trench support shall be left in place but shall be cut off a minimum of 4-feet below finish grade.

7. Movable trench wall supports shall not disturb the installed pipe and its embedment when being moved. Embedment shall be compacted before trench wall supports are moved. When trench wall supports are moved finish placing and compacting embedment.

Section 11.2 Product Installation - Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe installations shall conform to, but not limited to, these Guidelines and Policies, ASTM D2321, ASTM 3034, AWWA C-900, and AWWA C-905.

2. Comply with Section 11.1 of these Guidelines and Policies, the following shall be adhered to.

11.2.1 Laying Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe and materials shall be provided with all necessary equipment and incidentals required to install and test PVC pipe and fittings for sewer conveyance uses.

2. PVC Pipe is not intended to be continuously stored in direct sunlight. The Contractor shall be responsible for providing an area, close to the area of work, to protect the PVC Pipe from damage due to direct sunlight exposure.

3. Pipe shall be laid in accordance with **Trench Detail for Sewer Pipe (S-01.0)**.
4. Pipe and fittings shall be carefully cleaned with a dry cloth to remove all sand, mud, clay, oil, and/or ice to be left clean and dry. Every precaution shall be taken to prevent all foreign material from entering the pipe while it is being placed in the trench.
5. At times when pipe laying is not in progress, the open ends of the pipes shall be closed by a watertight plug or other means approved by the Commission's Authorized Field Representative. If water is in the trench, the seal shall remain in place until the trench is pumped dry. No pipe shall be laid in water or when, in the opinion of the Commission's Authorized Field Representative trench conditions are unsuitable.
6. Proper implements, tools, and facilities satisfactory to the Commission's Authorized Field Representative shall be provided and used by the Installer and/or the Commission's Construction Crew for the safe and convenient prosecution of the work.
7. All pipes shall be laid at the grade, depth, and as indicated on the approved Site Plans.
8. Pipe and fittings shall be placed in the trench with the invert conforming to the elevations, slope, and depth as indicated on the approved Site Plans. Bell holes shall be provided in the bedding to ensure uniform pipe support.
9. All pipe ends shall be marked to indicate the insertion stop position.
10. Push spigot into bell after properly applying lubricant according to jointing procedures below.

11.2.2 Jointing Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe shall be carefully jointed in conformity with the best practice and the detailed instructions of manufacturer.
2. All pipe ends shall be thoroughly cleaned prior to and during the jointing operation.
3. All joints shall be made with proper lubrication as specified by the manufacturer of the pipe.

11.2.3 Bedding and Backfilling Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe embedment and backfill shall be in accordance with **Trench Detail for Sewer Pipe (S-01.0).**

2. Pipe Bedding Material shall meet Class I ASTM D2321 embedment material that shall be ¾-inch crushed stone, according to the Commission's Material Specifications.

3. The pipe embedment material in the pipe zone shall be placed by hand and compacted under and around the pipe.

4. The pipe embedment material shall be placed in 6-inch layers above top of pipe and hand compact to a point 12-inches, minimum, above the top of pipe.

5. Materials placed in the Backfill Zone from the pipe embedment materials in the Pipe Zone shall be Common Borrow Fill, according to the Commission's Material Specifications and shall be mechanically compacted. Common Borrow Fill shall be free from large clods, rocks, and cinders.

6. Backfill shall be graded with the placement of suitable soil material, as determined by the Commission Representative, in 12-inch (maximum) layers compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.

7. Any backfill area that does not conform to the above to the compaction requirement shall require the installation of ductile iron pipe, according to the Commission's Material Specifications, from manhole to manhole for sewer mains and along the entire service line run for Building Lateral Sewers.

11.2.4 Testing Polyvinyl Chloride (PVC) Sewer Pipe

1. The testing requirements for testing PVC sewer pipe are stated in the project specifications. Each Engineer will specify the type of tests required. The test could vary from a ball and cleaning test, a visual test, a leakage test, a low-pressure air test, infiltration or exfiltration test, or a pipe deflection test. Each test has its own specific methods. Testing is generally done between two consecutive manholes.

2. When testing, it is very important to make sure that the lines are clean. The ball test will usually accomplish this by flushing an appropriate size cleaning ball through the line.

3. Simple visual lamping with mirrors and lights can be used for visual tests, or a closed circuit television can also be used.

4. Leakage tests for sewer pipe shall be an air test in accordance with the following and the Standard Method for Pressure Testing Gravity Sewer Lines Form, attached in Section 0 of these Guidelines and Policies.

(a) It is extremely important that all branch connections be capped and secured before this type of test is attempted. Isolate the section of the sewer line to be tested by inflatable stoppers or other suitable test plugs.

(b) Plug or cap the ends of all branches, laterals, tees, wyes, and stubs to be included in the test to prevent air leakage. All plugs and caps shall be securely braced to prevent blow-out. One of the plugs or caps should have an inlet tap or other provision for connecting a hose to a portable air control source.

(c) Connect the air hose to the inlet tap and portable air control source. The air equipment shall consist of necessary valves and pressure gauges to control an oil-free air source and the rate at which air flows into the test section to enable monitoring of the air pressure within the test section.

(d) Air testing sewer line can be done with very low pressure. At no time will the air pressure exceed 5 PSI, unless otherwise approved by the Commission. Slowly introduce air into the section of pipe to be tested, until the air pressure is raised to approximately 4 psi and the test pipe section has stabilized. Disconnect the air supply and decrease the pressure to 3.5 psi before starting the test. Determine the time for a drop of 1 psi (3.5 psi to 2.5 psi), and compare this interval to the minimum specified pressure drop time from the following table to decide if the rate of air loss is within the allowable limits.

(e) Upon completion of the test, open the bleeder valve and allow all air to escape. Plugs should not be removed until all air pressure in the tested section has been reduced to atmospheric pressure.

5. Leakage tests may be infiltration and ex-filtration testing but shall be at the discretion of the Commission. Leakage will not exceed fifty gallons per inch of external pipe diameter per mile of pipe per day. Other requirements regarding level of water must be met to accomplish this kind of testing.

6. Proper placement and compaction of the backfill material in the embedment zone of the pipe in the installation process is the key to maintaining minimum deflection.

7. Deflection tests shall be taken at the discretion of the Commission with a proper size mandrel or sewer ball that is put through the pipe on a go or no-go basis. Again, it must be emphasized that to ensure accurate testing, the lines must be thoroughly cleaned prior to testing.

8. In deflection testing, the maximum allowable pipe deflection (which is reducing the vertical inside diameter) is 7 1/2%.

9. Other specific testing details may be found in the ASTM D-2321 Specification on the Standard Recommended Practice for Underground Installations of PVC Sewer Pipe, or in the PVC pipe installation chapter of the Handbook of PVC Pipe Design and Construction Manual published by the Uni-Bell Plastic Pipe Association.

Section 11.3 Product Installation – Ductile Iron (DI) Pipe and Fittings

1. Pipe installations shall conform to, but not limited to, these Guidelines and Policies, ASTM A746-03, AWWA C-104, AWWA C-110, AWWA C150, AWWA C-151, and/or AWWA C153.
2. Comply with Section 11.1 of these Guidelines and Policies and the following shall be adhered to.

11.3.1 Laying and Jointing Ductile Iron (DI) Pipe

1. No deflection at the joints is allowed.
2. Accept for the deflection requirement above, all new or proposed DI sanitary sewer main shall be installed in accordance with Section 6.2.1 of these Guidelines and Policies, unless otherwise approved by the Commission.

11.3.2 Installing Ductile Iron (DI) Fittings

1. Restraint for push on joint pipe shall be "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. Restraint for mechanical joint pipe shall use retainer glands for restraining joint. All restrained joints shall be suitable for the specified conditions and shall be as recommended by the manufacturer. The required lengths of restrained joints shall be as specified by the Commission.
2. Fittings shall have, as a minimum, the same pressure rating of a connecting pipe.
3. Closures shall be made with mechanical joint ductile iron solid sleeves and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be as directed by the Commission.
4. In addition to the above, all new or proposed DI sanitary sewer fittings shall be installed in accordance with Section 6.2.7 of these Guidelines and Policies, unless otherwise approved by the Commission.

11.3.3 Installing Couplings for use with Ductile Iron (DI) Pipe

All sleeve type couplings used in the installation or repair of new, existing, or proposed DI sanitary sewer main shall be installed in accordance with Section 6.2.10 of these Guidelines and Policies, unless otherwise approved by the Commission.

11.3.4 Bedding and Backfilling Ductile Iron (DI) Pipe and Fittings

All new or proposed DI sanitary sewer main shall be bedded and backfilled in accordance with Section 6.2.1 and Section 11.2.3 of these Guidelines and Policies, unless otherwise approved by the Commission.

11.3.5 Testing Ductile Iron (DI) Pipe and Fittings

All new or proposed DI sanitary sewer main shall be tested in accordance with Section 11.2.4 of these Guidelines and Policies, unless otherwise approved by the Commission.

Section 11.4 Sanitary Sewer Manholes

11.4.1 General

1. Manholes installed in the Commission's collection system shall be in accordance with the following details:

   (a) Pre-cast Concrete Sewer Manhole shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**.

   (b) Pre-cast Concrete Sewer Manhole Pipe Connections shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Pipe Connections Detail (S-02.1)**.

   (c) End of sewer mains shall terminate in a manhole. End of sewer mains shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0), Pre-cast Concrete Sewer Manhole Pipe Connections Detail (S-02.1), and End of Sewer Main Detail (S-02.2)**.

   (d) Connections to manholes requiring an external connection shall be installed in accordance with **External Drop Manhole Detail (S-02.3)**.

   (e) Connections to manholes requiring an internal connection shall be installed in accordance with **Internal Drop Manhole Detail (S-02.4)**.

2. Pre-cast Concrete Manholes and all materials used in its construction and structures shall be constructed to the dimensions shown on the Design Drawings,

as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

3. Pre-cast Manholes shall be provided in 4-foot, 5-foot, and 6-foot diameter in accordance with the Commission's Material Specifications. All other diameters must be approved by the Commission.

   (a) The minimum diameter manhole allowed is 4-feet.

(b) The maximum pipe diameter allowed is defined in the following table.

Diameter (feet)	Wall Thickness (inches)	Base Thickness (inches)	Max Pipe* (RCP) Diameter Allowed (inches)	Max Pipe* (DI/PVC) Diameter Allowed (inches)
4	5	6	18	24
5	6	8	30	36
6	7	8	36	48

* Pipe diameter may vary depending on number of penetrations.

(c) Internal drop manholes, installed along sanitary sewer mains, shall be at least 6-feet in diameter.

(d) Internal drop manholes, installed for Building Sewer Connections, typically are not allowed, but may be considered on a case-by-case basis if other connection options are not feasible.

4. Pre-cast Concrete Manholes shall be at no more than 300-feet apart and at all changes in diameter, material, slope, and direction.

11.4.2 Pre-cast Concrete Manholes

1. Surfaces of Pre-cast Concrete Manholes and structures shall be painted with two coats of bituminous damp proofing at the rate of 30 to 60 sq ft per gallon, in accordance with manufacturer's instructions.

2. Pre-cast Concrete Manholes bases shall be placed on a bed of 12-inches of crushed stone ¾-inch. Manhole base grades shall be set so that any required grade adjustment to bring the manhole frame and cover to final grade does not exceed 8-in.

3. All work shall be protected at all times against flooding and/or flotation. Cast-in-place bases, if required, shall be constructed in accordance with the manufacturer's recommendations.

4. Pre-cast Concrete Manholes concrete barrel sections and structures shall be set plumb with a 1/4-in maximum out of plumb tolerance allowed. The inside of any leaking barrel section joint shall be caulked with lead wool or non-shrink grout to the satisfaction of the Commission or its representative.

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5. Jointing of Pre-cast Concrete Manholes sections and structures sections shall be accomplished with butyl rubber joint sealant gasket in accordance with the Commission's Materials Specifications installed at the bell and spigot joints of each section, unless otherwise approved by the Commission.

   (a) All installation surfaces shall be clean and dry.

   (b) Apply one (1) continuous bead of sealant around the periphery of the joint by pressing the bead firmly into place. Remove backing paper as the installation progresses.

   (c) Use of primer is required when temperatures are below 40-degrees F and/or the concrete is damp.

   (d) Extremely wet conditions require the installation to have two (2) beads applied in the same manner as above.

6. Seal tongue and groove joints of pre-cast manhole sections with rubber O-ring gasket installed per the manufacturer's instructions in a recessed groove.

7. The outside and inside joint of tongue and groove manhole sections shall be filled with non-shrink mortar and finished flush with the adjoining surfaces.

8. Joints shall be allowed to set for at least 14 hours before backfilling unless a shorter period is specifically approved by the Commission or its representative.

9. Holes required for handling in the concrete barrel sections shall be plugged with a non-shrinking grout, or concrete plugs in combination with non-shrinking grout. Finish flush on the inside.

10. Holes in pre-cast sections shall be cut to accommodate pipes prior to setting manhole sections in place to prevent jarring that may loosen the mortar joints.

11. Pre-cast manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).

12. Integrally cast knockout panels shall be provided at locations where indicated by the Commission or shown on Design Drawings. Sizes shall be adequate for intended pipe sizes. Knockout panels shall have no steel reinforcing.

13. Backfill shall be laid and compacted carefully and evenly around manhole sections.

14. The Commission will visually inspect manholes for possible leaks before backfilling of manholes is allowed. All joints shall be sealed satisfactorily for the Commission.

15. Connections into the manhole shall be in accordance with **Pre-cast Concrete Sewer Pipe Connection Details (S-02.1)** and the following:

    (a) Flexible sleeve - Integrally cast sleeve in pre-cast manhole section or install sleeve in a formed or cored opening. Fasten pipe in sleeve with stainless steel clamp(s). Coat stainless steel clamp(s) with bituminous material to protect from corrosion.

    (b) Grout in place - Grout around the pipe connection where a formed, tapered circular opening is larger than the pipe outside diameter.

11.4.3 Testing Pre-cast Concrete Manholes

1. Each manhole shall be tested for leakage. An exfiltration test or a vacuum test may be used.

2. The exfiltration test is as follows:

    (a) Assemble manhole in place; fill and point all lifting holes and exterior joints within 6-feet of the ground surface with an approved non-shrinking mortar. Test prior to placing the shelf and invert and before filling and pointing the horizontal joints below 6-feet of depth. Lower ground water table below bottom of the manhole for the duration of the test. Plug all pipes and other openings into the manhole and brace to prevent blow out

    (b) Fill manhole with water to the top of the cone section. If the excavation has not been backfilled and no water is observed moving down the surface of the manhole, then the manhole is satisfactorily watertight.

    (c) If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. Retesting as described below shall proceed until a satisfactory test is obtained.

3. The vacuum test in shall be accordance with the following and the Standard Method for Concrete Sewer Manhole Vacuum Test Form, attached in Section 15.1.7 of these Guidelines and Policies.

    (a) After a manhole has been constructed, and before the frame and cover have been installed, the Contractor shall conduct a Manhole Acceptance Test using the following vacuum test procedure:

    (b) Plug all lift holes with an approved non-shrink grout.

    (c) Plug all pipes entering the manhole, taking care to securely brace the plug from being drawn into the manhole.

(d) The test head shall be placed at the inside of the top of the concrete cone section and the seal inflated in accordance with manufacturer's recommendations.

(e) Draw a vacuum of 10-inches of mercury (Hg) and shut off the vacuum pump. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. Use the following table to determine minimum test times for various manhole diameters and depths.

(f) If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. Retesting shall proceed until a satisfactory test is obtained.

4. If the manhole excavation has been backfilled before the test, or if the test results, as described above are unsatisfactory to the Commission or its representative, then continue with the test as follows:

   (a) A period of time shall be permitted to allow for absorption. Following this period, refill manhole to the top of the cone, and allow at least 8-hours to pass. At the end of the test period, refill the manhole to the top of the cone again, measuring the volume of water added. Extrapolate the refill amount to a 24-hour leakage rate. The leakage for each manhole shall not exceed one gallon per vertical foot for a 24-hour period. If the manhole fails this requirement, but the leakage does not exceed three gallons per vertical foot per day, repairs by manufacturer recommended methods shall be made and as directed by the Commission. A retest shall follow. If leakage due to a defective section of joint exceeds three gallons per vertical foot per day, the manhole shall be rejected, replaced, and retested.

   (b) No adjustment in the leakage allowance will be permitted for unknown causes such as leaking plugs, absorptions, etc. It will be assumed that all loss of water during the test is a result of leaks through the joints or through the concrete.

5. An infiltration test may be substituted for an exfiltration test if the ground water table is above the highest joint in the manhole. If there is no leakage into the manhole as determined by the Commission or its representative, the manhole will be considered water-tight. If the Commission is not satisfied, testing shall be performed as described above.

6. All new Pre-cast Concrete Manholes shall be thoroughly cleaned of all silt, debris, and foreign matter of any kind, prior to final inspections.

11.4.4 Brick Masonry:

1. In all manholes, the invert channel within the structure shall be an inverted arch with bricks laid as stretchers and on edge and so constructed as to conform in shape to the lower half of the pipe.

2. In manholes, an arch shall be constructed over the inlet and outlet pipes with bricks laid as headers and on edge.

3. The shelf in the manholes shall consist of bricks laid flat and the top of the shelf shall be at the elevation of the top of the pipe, in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**, and shall be sloped toward the channel.

11.4.5 Manhole Frame and Cover:

1. Manhole frame and covers shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**.

2. Pre-cast concrete grade rings and/or brick and non-shrink mortar shall be used to adjust manhole frame and cover to final grade.

3. The inside and outside of pre-cast concrete grade rings and/or brick shall be sealed with hydraulic cement.

4. Under no circumstances shall barrel blocks be allowed.

5. Castings shall be set in non-shrink grout. Non-shrink grout shall be placed all around casting to 4-inches above flange.

6. Castings shall be thoroughly cleaned and subject to hammer inspection.

Section 11.5 Repair of Sewer Mains and Building Sewer Connections

1. Sewer Mains and Building Sewer Connections shall be repaired in accordance with **Building Sewer Connection and Sewer Main Repair Detail (S-04.0)**, unless otherwise approved by the Commission.

2. Sewer Mains and Building Sewer Connections repairs and all materials used in its construction and structures shall be constructed to the dimensions shown on the Design Drawings, as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

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CHAPTER 12 BUILDING SEWER CONNECTIONS

12.1.1 General

1. Typically, Building Sewer Connections installed in the Commission's collection system shall be connected to sewer mains and in accordance with the following details, unless otherwise approved by the Commission:

   (a) Building Sewer Connections to be connected to an existing sewer main shall be installed in accordance with **Existing Sewer Main to Building Sewer Connection Detail (S-04.0)**.

   (b) Building Sewer Connections to be connected to a new sewer main shall be installed in accordance with **New Sewer Main to Building Sewer Connection Detail (S-04.1)**.

   (c) Building Sewer Connections longer than 100-feet require a clean out that shall be installed in accordance with **Clean Out with Sweep Detail (S-04.2)**.

   (d) Building Sewer Connections to sewer mains 12-feet deep or greater require a chimney that shall be installed in accordance with **Building Sewer Connection with Chimney Detail (S-04.3)**.

   (e) Building Sewer Connections that conflict with the location of a new or existing utility require an offset that shall be installed in accordance with **Building Sewer Connection to Sewer Main with Conflicts Detail (S-04.4)**.

2. The Commission may allow Building Sewer Connections that require an external drop connection into a Sanitary Sewer Manhole with prior approval from the Commission' E&TS and the following:

   (a) Building Sewer Connections that require connection to a manhole shall be installed in accordance with **External Drop Manhole Detail (S-02.3),** unless otherwise approved by the Commission.

   (b) Building Sewer Connections that require an external drop manhole connection shall be installed in accordance with Section 11.4, unless otherwise approved by the Commission.

3. The Commission may allow Building Sewer Connections by an internal drop connection into a Sanitary Sewer manhole with prior approval from the Commission's E&TS and the following:

   (a) Building Sewer Connections that require an internal drop connection, typically are not allowed, but may be considered on a case-by-case basis, and only if the other connection options are not feasible.

(b) Building Sewer Connections that require an internal drop connection shall be installed in accordance with **Internal Drop Manhole Detail (S-02.4)**, unless otherwise approved by the Commission.

(c) Building Sewer Connections that require an internal drop connection shall be installed in accordance with Section 11.4, unless otherwise approved by the Commission.

4. Building Sewer Connections and all materials used in its construction and structures shall be constructed to the dimensions shown on the Design Drawings, as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

12.1.2 Building Sewer Connections

1. Pipe used for building sewer pipe shall be at least 6-inches in diameter, shall be PVC Gravity Pipe as specified in the Commission's Material Specifications unless otherwise approved by the Commission's Engineering and Technical Services.

   (a) All Building Sewer Connections shall be installed in accordance with these Guidelines and Policies and in accordance with the Massachusetts State Plumbing Code.

   (b) When a conflict in minimum diameters exists these Guidelines and Policies shall govern.

2. Building Sewer Pipes running from the main sewer line to the building being serviced are installed in the same manner as the main line using proper installation procedures.

3. If main line full wyes have been installed, put the correct bend into the outlet of the wye and lay the service line to the building, making the connection at that point.

4. It is extremely important when making the connection to the main that proper bedding and compaction is done at the point of connection to prevent any movement, collapse, or deflection.

5. If the full wye has not been installed in the line, a saddle type wye must be installed on the pipe to gain entry for the service line. Care must be exercised when preparing the main line for this saddle.

6. The saddle wye has a unique centering ring feature. A template is provided which is placed on the main line and a hole cut to the exact size.

7. When the hole is completed, use care to clean, making sure that no rough edges remain.

8. Stainless steel galvanized straps will be used to secure the wye in position after the solvent has been applied to the saddle and the pipe.

9. The fitting or bend needed to make the correct position of the service line can then be placed and the service line laid to the unit.

10. Typically, horizontal deflection on the Building Sewer Pipe shall not exceed 45-degrees.

    (a) Each single 45-degree horizontal bend shall require a clean out up stream of the bend.

    (b) Any combination of lesser bends that creates horizontal deflection(s) greater than 45-degrees shall require a clean out up stream of the bends for each 45-degrees of deflection.

11. The same method of carefully trenching, placing, and backfilling done on the main lines shall be in practice on the service lines.

12. Commission construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.

13. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

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CHAPTER 13 SEWER PUMP STATIONS

Section 13.1 SUBMERSIBLE SEWAGE PUMP STATIONS

13.1.1 General

1. The submersible pumping station shall be provided in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.
2. All materials, equipment and incidentals required to install wastewater pumping stations shall be provided with all related interior piping and electrical works as specified herein and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
3. The Installer shall coordinate his/her operations and those of the supplier of the pumping station such that the site is excavated, and the stations materials delivered and installed in accordance with the manufacturer's recommendations.

13.1.2 Pump Station Chambers – Wet Well and Valve Vault

1. The underground pump station chambers shall be of reinforced concrete construction, in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0),** unless otherwise approved by the Commission.
2. The underground pump station chambers shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pre-cast concrete base shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
4. The valve vault shall be designed with a minimum internal vertical clearance of 7-feet.

13.1.3 Pump Station Controls and Ancillary Equipment

1. The Pumps Station Controls and Ancillary Equipment shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0),** unless otherwise approved by the Commission.
2. Pumps Station Controls and Ancillary Equipment shall be installed as recommended by the manufacturer and/or detailed by the design engineer.

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13.1.4 Pump Station Control Panels

1. The Pumps Station Control Panels shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0),** unless otherwise approved by the Commission.
2. Pumps Station Control Panels shall be installed as recommended by the manufacturer and/or detailed by the design engineer.

13.1.5 Pump Station Communication System

1. The pump station shall be equipped with radio contact and SCADA system for relay of alarms and monitoring signals to pump station operator.
2. Radio/SCADA systems must be compatible with the Springfield Water and Sewer Commission Operator's system, namely United Water (UW). Contact UW at (413) 732-0293 for coordination of design/procurement of communications equipment.

13.1.6 Pump Station Piping and Valves

1. The Pump Station Piping and Valves shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0),** unless otherwise approved by the Commission.
2. Pump Station Piping and Valves shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Ductile iron (DI) pipe shall be used for sewer pump station piping and shall be in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission.

13.1.7 Pressure Gauges

1. The Pump Station Pressure Gauges shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0),** unless otherwise approved by the Commission.
2. Pump Station Pressure Gauges shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pump Station Pressure Gauges shall be installed in tapped holes provided in the discharge pipes located in the valve vault, upstream of each check valve.
4. Tapped holes shall be 1/4-inch NPT.

13.1.8 Vent

1. The Pump Station Vents shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0),** unless otherwise approved by the Commission.
2. Pump Station Vents shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pump Station Vents shall be located in the top section of the wet well with the inlet facing down and at least 3-feet above finish grade.

13.1.9 Emergency Power Generation

1. The Pump Station Emergency Power Generation shall be in accordance with the Commission's Material Specifications unless otherwise approved by the Commission.
2. Pump Station Vents shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pump station shall be equipped with a stand-by emergency power generation source.
4. The power generator housing shall consist of a concrete structure. Prefabricated housing units may be proposed for the Commission's consideration.
5. Type of fuel, storage capacity, and storage location shall be approved by the City of Springfield Fire Department.

13.1.10 Pump Station Site

1. Pump station site shall be protected by means suitable to prevent access to pump station structures, electric panels, fuel tank, etc.
2. At minimum, the site shall be enclosed by an 8-foot fence (6-feet of fence and 2-feet of barbed wire).
3. Adequate lighting shall be included in the design to ensure safety to operators at all access points to the station structures.
4. Site layout shall meet all City of Springfield zoning requirements.
5. Site layout shall include a minimum 10-foot width paved access ways to pump station entrance, vaults, generator building access doors, fuel tank, and other locations, if any, as directed by the Commission.

6. Minimum clearance for fuel tank shall be in accordance with the City of Springfield Fire Department requirements and/or directive.
7. Signage shall conform to the Springfield Water and Sewer Commission requirements.

13.1.11 Submittals

Submittals shall be in accordance with Section 4.1 of these Guidelines and Polices and in accordance with the Commission's Material Specifications.

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CHAPTER 14 LOW PRESSURE SEWER PUMP STATIONS

Section 14.1 Low Pressure Sanitary Sewer (LPSS) Systems

14.1.1 Low Pressure Sanitary Sewer – General

1. The LPSS main is the portion of the LPSS system collecting sewer service laterals and shall be located within the public right of way or within an easement granted, and formalized with the registry of deeds, to the Springfield Water and Sewer Commission (Commission).
2. LPSS mains shall include the LPSS main pipe, flushing cleanout manholes, main valves, service tees, and connection to an outlet manhole discharging to the existing gravity sewer system.
3. LPSS systems shall be designed by the project owner's professionally licensed consulting engineer and approved by the Commission.
4. All LPSS main installs shall be reviewed and inspected by the Commission.
5. Upon project completion, inspection, testing, acceptance, and the warranty period the Commission assumes ownership and operation of the LPSS main.
6. LPSS system layout shall be such that there is no vertical high point requiring an air relief valve.
7. All materials used for the pressure portion of these systems must be pressure rated at a minimum of 160 psi operating pressure and suitable for the wastewater environment and resistant to corrosion.
8. All metal components shall be 316 stainless steel and hardware shall be 304 stainless steel unless otherwise specified herein or approved by the Commission.

14.1.2 Low Pressure Sanitary Sewer – Mains < 3 inch Diameter

1. LPSS pipe shall be provided in accordance with the Commission's Material Specifications and installed in accordance with the **Low Pressure Sanitary Sewer Pipe Trench Detail (S-09.2),** and these Guidelines and Policies, unless otherwise approved by the Commission.
2. LPSS mains shall be installed in straight segments such that there are no horizontal alignment deviations. If a horizontal alignment change is required, a flushing manhole shall be installed at the horizontal alignment change in accordance with the **Low Pressure Sanitary Sewer Main Inline Flushing Detail (S-09.4),** unless otherwise approved by the Commission.

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3. The discharge point of LPSS system shall be to a manhole on the exiting gravity wastewater collection system and may require replacement or upgrade of the Commission's exiting collection system, by the LPSS project owner, as determined by the Commission. The connection to the discharge point manhole shall be cored at same elevation as spring line of effluent gravity sewer pipe and a minimum of 2 inch annular space between LPSS. The cored hole shall be sealed watertight in accordance with the **Precast Concrete Sewer Pipe Connections Detail (S-02.1),** unless otherwise approved by the Commission. The brick invert and shelf of manhole shall be configured /modified to channel flows from LPSS main toward gravity pipe.

4. The LPSS main shall have a service lateral tee and corporation stop installed along the frontage of each and every property it passes by regardless of who owns the property or property level of development. No additional future service taps or tee installations will be allowed along the main which are not part of the original system design, unless allowed by the Executive Director.

5. LPSS mains shall be hydrostatically tested at one and a half times the maximum designed operating pressure. No pressure drop will be allowed for the 2 hour test duration.

6. Minimum bury depth shall be 6 inches below the average frost depth (48 inch) for a total of 54 inches. Pipe that is not installed at least 54 inches deep must be insulated. Pre-insulated pipe shall be required if insulated segments exceed 40 feet in length. Insulated segments under 40 feet in length may utilize field applied insulation.

7. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be in accordance with the pipe manufacturer's recommendations. The pipe should be handled in such a manner that it is not damaged by being dragged over sharp objects or cut by chokers or lifting equipment.

8. Segments of pipe having cuts or gouges in excess of 10 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method. Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt-fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt-fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, fusion temperature, alignment, and fusion pressure.

9. Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers should be avoided. Nylon slings are preferred. Spreader bars should be used when lifting long, fused sections. Care should be exercised to avoid cutting or gouging the pipe.

10. Assemble the compression fittings according to the fitting manufacturer's recommendations.

11. The trench and trench bottom should be constructed in accordance with ASTM D 2321. Embedment materials should be Class I, Class II or Class III materials as defined in ASTM D 2321. Bedding of the pipe should be performed in accordance with ASTM D 2321. Compaction should be as specified in ASTM D 2321.

12. Haunching and initial backfill should be as specified in ASTM D 2321 using Class I, Class II or Class III materials. In cases where a compaction of 85 percent Standard Proctor Density is not attainable, the Commission may wish to increase the SDR of the pipe to provide adequate stiffness. ASTM D 2321 sections titled "Minimum Cover for Load Application," "Use of Compaction Equipment" and "Removal of Trench Protection" shall apply, unless directed otherwise by the Commission.

14.1.3 Low Pressure Sewer System – Valves

1. Valves shall be sized to match LPSS main pipe diameter and shall be 316 stainless steel fully ported quarter turn ball valves, with a corrosion resistant handle and installed inside flushing manholes.

14.1.4 Inline Flushing Structure

1. The LPSS main shall include an inline flushing structure at every 500 feet of LPSS main installed and at all horizontal alignment changes. Flushing structures shall be located within the right of way and accessible by SWSC crews. Flushing structures shall not be within a driveway or in a location that would be impeded by snow storage.

2. All fittings and valves shall be restrained to the base of the structure using 3/4 inch 304 stainless steel rods set 3 inches into the base with anchoring epoxy, 304 stainless steel hardware, and 1/8 inch thick by 1 ½ inch thick anchor straps. Horizontal bends shall also be restrained with blocking/concrete against the interior walls of the structure.

3. Inline flushing structures shall be installed in accordance with the Low Pressure Sanitary Sewer Main Inline Flushing Structure Detail (S-09.4).

Springfield Water and Sewer Commission

Guidelines and Policies

14.1.5 Terminal Flushing Structure

1. The LPSS main shall include a terminal flushing structure at the lowest elevation end of each LPSS main line to flush out the pipe as needed for maintenance. Flushing structures shall be located within the right of way and accessible by SWSC crews. It shall not be within a driveway or in a location that would be impeded by snow storage.

2. All valves and fittings within the terminal flushing structure shall be restrained at every 18 inches minimum to the base of the structure using ¾ inch 304 stainless steel rods set 3 inches into the base with anchoring epoxy, 304 stainless steel hardware, and 1/8 inch thick by 1 ½ inch thick anchor straps. The terminus of LPSS main pipe shall also be restrained with blocking/concrete against the interior wall of the structure.

3. Terminal flushing structures shall be installed in accordance with the **Low Pressure Sanitary Sewer Terminal Flushing Structure Detail (S-09.5)**.

14.1.6 Detectable Warning Tape

1. Detectable warning tape shall be installed 12-18 inches below grade to allow use of a metal detector for future field location during Dig Safe mark out. Detectable warning tape is required for all pressure sewer main installations.

Section 14.2 Low Pressure Sanitary Sewer Services

14.2.1 Low Pressure Sanitary Sewer Services – General

1. LPSS service laterals are owned, operated, and maintained by the property Owner. This includes all service and maintenance of the grinder pump unit, service piping, electrical equipment, control system, and appurtenances.

2. A LPSS service lateral is the portion of the LPSS system between the LPSS or gravity sewer main and the building. The LPSS service lateral shall include gravity piping from the building to the sewage grinder pump/wetwell unit, sewage grinder pump/wetwell unit, low pressure service piping from the sewage grinder pump/wetwell unit, to the low pressure sewer main, lateral valve and lateral check valve, service valve at the service tee along the low pressure sewer main.

3. LPSS service laterals with grinder pumps in commercial, industrial, and dense residential complex applications shall be designed and specified by the project's professionally licensed Engineer of Record and approved by SWSC.

4. LPSS service laterals with grinder pumps in low density residential applications, with up to two dwelling units, may be installed per the project owner's sewage grinder pump station's manufacturer and as approved by the SWSC.
5. LPSS service laterals shall be installed in accordance with the **LPSS Service Lateral Detail (S-09.3)**.
6. All LPSS service lateral installs shall be reviewed and inspected by SWSC.
7. It is the Owner's responsibility to not abuse the LPSS system by avoiding the disposal of materials which should not be introduced into a grinder pump system. These include but are not limited to: hazardous chemicals, flammable materials, gasoline, fats oils and grease, metal, sand, wood, cloth, cat litter, paint, sanitary products, floss, cleaning wipes, gravel, seafood shells, and syringes. Owner shall review their grinder pump system owner's manual for further information and details.
8. LPSS service laterals shall be hydrostatically tested at one and a half times the maximum system designed operating pressure. No pressure drop will be allowed for the 2 hour test duration.
9. All metal components shall be 316 stainless steel and hardware shall be 304 stainless steel unless otherwise specified herein or approved by the SWSC.

14.2.2 Low Pressure Sanitary Sewer Services – Laterals < 3 inch Diameter

1. Pipe and fitting material shall be one of the following SDR-21 PVC, Sch 40 PVC, or SDR-11 HDPE. Final determination of the type and size is the responsibility of the project owner's consulting engineer (MA P.E.) or the sewage grinder pump station's manufacturer and must be approved by the SWSC.
2. LPSS service laterals shall be hydrostatically tested at one and a half times the maximum system designed operating pressure. No pressure drop will be allowed for the 2 hour test duration.
3. Minimum bury depth shall be 6 inches below the average frost depth (48 inch) for a total of 54 inches. Pre-insulated pipe shall be required if insulated segments exceed 40 feet in length. Insulated segments under 40 feet in length may utilize field applied insulation.

14.2.3 Detectable Warning Tape

1. Detectable warning tape shall be installed 12-18 inches below grade to allow use of a metal detector for future field location during Dig Safe mark out. Detectable warning tape is required for all non-metal pressure sewer installations.

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14.2.4 LPSS Service Lateral Curb Stop and Check Valve Assembly

1. A 304 or 316 stainless steel curb stop/check valve assembly shall be located 2 feet from face of curb and within the public right of way. The curb stop shall have an integral IK operating nut and be fully ported. The check valve shall have a flapper hinge which seats completely at low back pressure. The assembly shall be specifically designed for use with HDPE and PVC pressure sewer piping with female NPT at each end.

14.2.5 LPSS Service Lateral Valve Box

1. Installed over the Curb Stop/Check Valve Assembly shall be a buffalo style service box. The service box shall be heavy cast iron extension (adjustable) type, slide style, with arch pattern base and a recessed cover. The arch pattern base shall accommodate a curb stop matching size of lateral pipe.
2. LPSS service lateral valve box shall be installed in accordance with the Low Pressure Sanitary Service / Main Valve Box in Non-paved Areas Detail (S-09.1).

Section 14.3 Sewage Grinder Pump Station

14.3.1 Sewage Grinder Pump Station – General

1. This section is intended to establish the minimum criteria and requirements for private grinder pump stations installation on private property for sewer service for a location which cannot be served by gravity sewer.
2. The Owner is responsible for the design, procurement, delivery, installation, and maintenance of grinder pump station units.
3. Grinder pump stations shall conform to all state, federal, and local regulations, and meet accepted standards for plumbing equipment for use near residences. It shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the National Sanitation Foundation seal.
4. Sewage grinder pump stations and appurtenances are private structures that are to be owned, operated, and maintained by the property Owner.
5. The grinder pump station supplier, or manufacturer, and project Engineer of Record shall participate in the installation and start-up testing of the grinder pump station.

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6. The grinder pump station shall be installed on the Owner's property.

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CHAPTER 15 FORMS

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.1 Commission Approved Contractor - Application Form

1. Date Application Submitted:_____

2. Type of Work to be Performed by Applicant: ☐ Water ☐ Sewer ☐ Both

3. Application Fee must be submitted with this completed application. This fee is non-refundable. The fee may be paid with a check or money order.

   Application Fee: ☐ $250.00 Received by: _____

   Renewal Fee: ☐ $100.00 Received by: _____

4. Applicant's Company Name: _____

   Owner:_____

   Business Address: _____

   _____

   Office Contact: _____

   Telephone Number: _____

   Fax Number: _____

   Email Address: _____

5. Applicant's Responsible Supervisors:

Name	Cellular Phone Number

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6. Please provide a narrative description of the following:

A. A brief company history indicating the Applicant has been in business for five (5) years installing and repairing water and/or sewer facilities.

B. Briefly, discuss the Applicant's procedure and equipment for pressure testing water and sewer mains that indicate the Applicant's company has the proper equipment and method of work to successfully pressure test said mains and services in projects. Hiring of a subcontractor to perform the pressure test is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted.

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C. Briefly, discuss the Applicant's procedure and equipment for disinfecting water mains and services that indicate the Applicant's company has the proper equipment and method of work to successfully disinfect said mains and services in projects. Hiring of a subcontractor to perform the disinfecting is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted. (Required for water work only)

_____

_____

_____

_____

_____

_____

D. List any applicable licenses (MA Master or Journeyman Plumber or Drinking Water Operator – Distribution 2 or higher License)

_____

_____

_____

_____

E. Proof of Required Bonding

Bonding Company _____

Telephone Number _____

Contact Person _____

☐ If the Applicant does not have MA Master/Journeyman Plumber License or a Drinking Water Operator – Distribution 2 or higher License the Bond Amount shall be $10,000.00

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☐ If the Applicant does have MA Master/Journeyman Plumber License or a Drinking Water Operator – Distribution 2 or higher License the Bond Amount shall be $7,500.00

☐ If the Applicant does have both a MA Master/Journeyman Plumber License and a Drinking Water Operator – Distribution 2 or higher License the Bond Amount shall be $5,000.00

F. Proof of Required Insurance

Insurance Company _____

Telephone Number _____

Contact Person _____

☐ Workmen's Compensation, Employer's Liability Insurance, and Occupational Disease Insurance:

☐ Comprehensive General Liability Insurance: in an amount of not less than $250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than $100,000.00 for property damage insurance

☐ Automobile Public Liability Insurance in an amount of not less than $250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than $100,000.00 for property damage insurance.

G. Sign and date the form titled "Indemnity" attached in the Form Section of these Guidelines and Policies.

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7. The Applicant shall provide references which shall list a minimum of five (5) Municipal projects that the Applicant has performed on Public Water Systems and/or Public Sewer, in the last five (5) years. The intent is to permit the Commission to contact parties for whom the Applicant has done Water System and/or Sewer System work in the immediate past. Start with your last or current project, detailing the immediate past five (5) projects. The reference is to include:

   A. Most recent or current project:

      Municipal Project:_____

      Description of services provided: _____

      _____

      _____

      Date the work was performed and date the work was completed: _____

      Point of Contact and Desk Top Telephone:

      _____

      Address:

      _____

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B. Next recent or current project:

Municipal Project:_____

Description of services provided: _____

_____

_____

Date the work was performed and date the work was completed: _____

Point of Contact and Desk Top Telephone:

_____

Address:

_____

C. Next recent or current project:

Municipal Project:_____

Description of services provided: _____

_____

_____

Date the work was performed and date the work was completed: _____

Point of Contact and Desk Top Telephone:

_____

Address:

_____

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D. Next recent or current project:

Municipal Project:_____

Description of services provided: _____

_____

_____

Date the work was performed and date the work was completed: _____

Point of Contact and Desk Top Telephone:

_____

Address:

_____

E. Next recent or current project:

Municipal Project:_____

Description of services provided: _____

_____

_____

Date the work was performed and date the work was completed: _____

Point of Contact and Desk Top Telephone:

_____

Address:

_____

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.2 Approved Contractor Safety Assurance Form

By signing this form, your company agrees to the following:

1. To abide by MGL Chapter 82 Sections 40 thru 40D also known as the Dig Safe Law.
2. The Commission is now part of DIG SAFE. Call 811 for mark out of Commission Facilities.
3. To abide by MGL Chapter 82A Section 1 also known as “Jackie’s' Law”.
4. To have all equipment operators licensed by the MA Department of Public Safety.
5. To ensure that ALL employees of the Company engaged in excavations have read and are familiar with Federal Safety Standards promulgated by OSHA on excavations: 29 CFR 1926, Subpart P “Excavations”.

Failure to comply with the above requirements may result in the removal from the Commission Approved Contractor List.

Contractor Name: _____
(PRINT FULL NAME)

Contractor Signature: _____ Date _____

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.3 Indemnity Form

The Commission Approved Contractor (Installer) shall save and hold harmless, indemnify, and defend the Springfield Water & Sewer Commission, its directors, officers, agents and employees from and against the following:

1. Any Liability, claim, suit, cost, loss, expense, fine, or damage of any kind allegedly suffered, incurred or threatened, either directly or through a third party, arising from the construction or installation of the Work including personal injury; death; property damage; inverse condemnation; patent and/or copyright infringement; damages arising from disputes as to licensing fees or the ownership of any land associated with the matters covered by this Agreement, any and all damages arising from the imposition of regulatory fines imposed for the violation of local ordinances, administrative regulations, or the like, in connection with the Work; or any combination of these, and regardless of whether or not such liability, claim, suit, cost, loss, expense, fine, or damage was unforeseeable at any time before acceptance of the improvements as completed, and including the defense of any suit(s), or other proceeding(s) concerning same.
2. The indemnification shall extend to and include any act or omission (negligent or no negligent) in connection with the matters covered by this Permit and attributable to the Owner, contractor, subcontractor, material supplier, or any officer, agent or employee of one or more of them, including, but not limited to, actions related to the construction, testing and connection of the Work and the ownership or use of real property.
3. Non-conditions: The covenants set forth in this Section are not conditioned or dependent on whether or not the Springfield Water & Sewer Commission has prepared, supplied, accepted, or approved any plan(s) or specification(s) in connection with this Work or has insurance or other indemnification covering any of these matters.

_____

Contractor's Signature

_____

Date

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.4 License Agreement Form

See next five (5) pages.

Springfield Water and Sewer Commission

Guidelines and Policies

LICENSE AGREEMENT
SANITARY SEWER MAIN EXTENSION
AND/OR
WATER MAIN EXTENSION

Revised October 3,2007

Agreement made this _____day of _____ 2008 by and between the SPRINGFIELD WATER AND SEWER COMMISSION (hereinafter referred to as the "COMMISSION"), a body politic incorporate and political subdivision of the Commonwealth of Massachusetts, with its offices at the 250 M St. Ext., Agawam, MA 01001, and

_____

(herein after referred to as "OWNER").

WHEREAS, the Owner has applied to the Commission for permission to construct the following;

- _____length in feet of 8-inch diameter Sanitary Sewer Main,
- _____length in feet of 10-inch diameter Sanitary Sewer Main,
- _____length in feet of 12-inch diameter Sanitary Sewer Main,
- _____length in feet of ___-inch diameter Sanitary Sewer Main,

and associated structures, as shown on the Plan and Profile entitled:

"_____",

Scale: 1 inch = ___ feet Date: _____, 200_, ___ revision ,

Prepared by: _____,

_____ said Plan and Profile being on file with the Commission.

WHEREAS, the Owner has applied to the Commission for permission to construct the following,

- _____length in feet of 6-inch diameter Water Main,
- _____length in feet of 8-inch diameter Water Main,
- _____length in feet of 12-inch diameter Water Main,
- _____length in feet of ___-inch diameter Water Main,
- _____tons of asphalt for paving restoration,

and associated structures, as shown on the Plan and Profile entitled:

"_____",

Scale: 1 inch = ___ feet Date: _____, 200_, ___ revision ,

Prepared by: _____,

_____ said Plan and Profile being on file with the Commission.

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NOW, THEREFORE, in consideration of the grant of this license, the Owner agrees that the installation works shall comply with the Commission's latest version of the Rules and Regulations, Guidelines, Policies, and Specifications; and also meet the following key requirements:

1. To install said work in accordance with the approved Plans reviewed by the Commission.
2. To hire a Commission Approved Contractor(s) to install said work.
3. To notify the Commission a minimum of forty-eight (48) hours prior to commencing any activity, which requires Commission inspections and/or assistance.
4. To ensure all work requiring inspection gets inspected by a representative of the Commission.
5. To begin the installation of sewer and/or water pipe(s) called for on said Plans and Specifications, no later than two calendar years from date of Commission approval of said plans and specifications.
6. To indemnify, defend, and hold harmless the Commission, and all of its officers, agents and/or employees against all suits, claims or liability of every name and nature, for/or on account of any injuries to persons or damage to property arising out of, or in consequence of, any acts of the Owner in the performance of the work covered by this Agreement, whether by it/themselves, or its/their employees and/or sub-contractors, in respect of such injuries or damages sustained during the performance of, prior to the completion and acceptance of the installation, damage to property due to the Owner's construction means and methods, and restoration of property impacted by the Owner's performance of the work covered by this Agreement.
7. By entering into this License Agreement, the Commission makes no representation and grants no privileges or permits to the Owner to enter any private way for the purpose of installing said sanitary sewer and/or water main.
8. Any easements required for the construction, and / or continued operation of water and/or sewer main extensions shall be secured by the Owner, reviewed, and approved as to form and extents by the Commission as part of the License Agreement. Any easements through private property shall be in the name of the Owner during the construction and warranty period. Easements shall be recorded at the Hampden County Registry of deeds. After all mains are approved by the Commission, have completed the warranty period, and have been accepted by the Commission, shall be deeded to the Commission by the Owner. That deed shall be recorded in the Hampden County Registry of Deeds.

Springfield Water and Sewer Commission

Guidelines and Policies

9. The following shall apply with respect to both water and/or sewer main extensions:

   (a) A main is approved for use, when the installation of a Public Water Main and/or Public Sewer main has been properly installed, completed, and passed all required inspections and tests according to the Commission's Guidelines and Policies.

   (b) A main is accepted, and become property of the Commission, only after the main installation of a Public Water Main and/or Public Sewer main has been approved for use, the warranty period has ended, and the Commission has received the "As-Built' plans in according with the Commission's Guidelines and Policies and any other required certification.

10. To furnish surety for Performance/Payment Bond and Maintenance Bond in the form of a Bond, Letter of Credit, or other Commission approved financial guarantee, made payable to the Springfield Water and Sewer Commission,

Description of Surety

Performance / Payment Bond (during construction period until all mains approved), in the amount of _____dollars.

_____ Bond No. – Company.
(Bond Number & Surety Company)

Description of Surety

Maintenance Bond (after construction period from time of all main approvals until end of warranty period – one-year minimum), in the amount of _____

_____

_____dollars.

+

(Bond Number & Surety Company)

NOTE: Originals of sureties shall be attached as part of this License Agreement for the Commission.

Springfield Water and Sewer Commission

Guidelines and Policies

11. Building sewer connection and sanitary main testing shall proceed as per the Commission's Guidelines and Policies, with key tasks summarized as follows:

    (a) The sanitary main shall be extended from the existing or proposed sanitary manhole at the existing public collection system. The connection between public and private systems shall be plugged until approved by the Commission. Sanitary Wyes for Building Sewer Connections shall be installed integral with the main line construction.

    (b) Sanitary building sewer connections shall be stubbed out to street line, capped, braced, and marked at grade level so that all required testing procedures may occur. No Building Sewer Connections may be completed and tied into a service location until the sewer has passed all testing requirements and main is approved in writing by the Commission.

    (c) Upon completion of the sanitary sewer and service stubs, said sewer shall be tested for infiltration-exfiltration (pressure test).

    (d) A closed circuit television inspection of the sewer main shall be completed after the successful completion of the infiltration-exfiltration testing. Documentation of the results shall be submitted to the Commission by the Owner.

    (e) Upon successful completion of all requirements above and as stated in the Commission's Rules and Regulations, Guidelines, and Policies, the sanitary main extension shall be approved for final connection with Building Sewer Connections. No service connections will be allowed to homes / buildings until the sanitary main is approved for use in writing by the Commission

12. Water main testing shall proceed as per the Commission's Guidelines and Policies, with key tasks summarized as follows.

    (a) Upon completion of the water main installation, said water main shall be tested for leaks (pressure test) prior to approval by the Commission.

    (b) Upon successful completion of the leakage test, the water main shall be disinfected with liquid chlorine, flushed, and shall successfully pass two consecutive bacterial tests prior to approval of the water main by the Commission.

    (c) Upon successful completion of all requirements above and as stated in the Commission's Rules and Regulations, Guidelines and Policies, the water main extension shall be approved for final connection with Water Services to buildings.

Springfield Water and Sewer Commission

Guidelines and Policies

13. In the event of a failure of water and/or sewer mains under any required testing, the Owner shall direct their contractor to remove and reinstall defective pipes and/or other system components and retest. All installation, repairs, and retesting shall take place at the Owner's expense.

14. If the Owner, or its contractor(s), fails to take needed prompt or corrective action during installation of the sewer and/or water pipe (in the opinion of the Executive Director of the Commission or authorized designees), the Commission shall make all repairs necessary or cause the same to be made. The cost for such repairs shall be paid by the Owner.

15. Upon successful completion of all sewer and water main testing requirements and approval of the water and sewer mains by the Commission, a minimum one year warranty period shall commence. If during the warranty period, defects become apparent, the Owner shall direct their contractor to effect repairs and replacements of defective pipes and other system components. Repairs and re-testing shall be required at the discretion of the Commission. The one year warranty period shall restart at the time of the completion of those repairs.

IN WITNESS WHEREOF, the Springfield Water and Sewer Commission and Owner have executed this Agreement on the day and year first above written.

SPRINGFIELD WATER AND SEWER COMMISSION:

_____	_____
Owner Signature	**Executive Director Signature**
_____	_____
_____	
Print Name and Title	**Print Name**
_____	_____
Print Date	**Print Date**
_____	250 M Street Extension, Agawam, MA 01001
Print Address	**Print Address**
_____	413-787-6256
Print Telephone Number	**Print Telephone Number**

Attachments: Performance / Payment Bond – By Owner
Maintenance Bond – By Owner

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.5 Inspection Form

Intentionally left blank for future use

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.6 Standard Method for Pressure Testing Gravity Sewer Lines Form

Location _____

Test Date _____

Installed By _____

Test Performed By _____

Inspector _____

ASTM Standard Method for Pressure Testing Gravity Sewer Lines

a. Isolate the section of the sewer line to be tested by inflatable stoppers or other suitable test plugs.

b. Plug or cap the ends of all branches, laterals, tees, wyes, and stubs to be included in the test to prevent air leakage. All plugs and caps shall be securely braced to prevent blow-out. One of the plugs or caps should have an inlet tap or other provision for connecting a hose to a portable air control source.

c. Connect the air hose to the inlet tap and portable air control source. The air equipment shall consist of necessary valves and pressure gauges to control an oil-free air source and the rate at which air flows into the test section to enable monitoring of the air pressure within the test section.

d. Slowly introduce air into the section of pipe to be tested, until the air pressure is raised to approximately 4 psi and the test pipe section has stabilized. Disconnect the air supply and decrease the pressure to 3.5 psi before starting the test. Determine the time for a drop of 1 psi (3.5 psi to 2.5 psi), and compare this interval to the minimum specified pressure drop time from the following table to decide if the rate of air loss is within the allowable limits.

e. Upon completion of the test, open the bleeder valve and allow all air to escape. Plugs should not be removed until all air pressure in the tested section has been reduced to atmospheric pressure.

Pipe Dia. (in.)	Minimum Time (min:sec)	Length for Min. Time (ft.)	Time for Various Length (sec)	Specification Time for Length (L) Shown (in min:sec)							
				100ft.	150ft	200ft	250ft	300ft	350ft	400ft	450ft
4	3:46	597	0.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33

Test Information

Diameter of Test Section (in inches) _____ Length of Test Section (in feet) _____

Allowable time for drop to 2.5 psi _____

Actual time for drop to 2.5 psi _____

Test Results

Passed (actual time > allowable time) _____ **Failed** (allowable time > actual time) _____

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.7 Standard Method for Sewer Manhole Vacuum Test Form

Location _____

Test Date _____

Installed By _____

Test Performed By _____

Manhole Tested _____

Inspector _____

ASTM Standard Method for Concrete Sewer Manhole Vacuum Test

After a manhole has been constructed, and before the frame and cover have been installed, the Contractor shall conduct a Manhole Acceptance Test using the following vacuum test procedure:

Plug all lift holes with an approved non-shrink grout.

Plug all pipes entering the manhole, taking care to securely brace the plug from being drawn into the manhole.

The test head shall be placed at the inside of the top of the concrete cone section and the seal inflated in accordance with manufacturer's recommendations.

Draw a vacuum of 10 inches of mercury (Hg) and shut off the vacuum pump. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. Use the following table to determine minimum test times for various manhole diameters and depths.

If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. Retesting shall proceed until a satisfactory test is obtained.

	Diameter (in Inches)								
Depth (in Feet)	**30**	**33**	**36**	**42**	**48**	**54**	**60**	**66**	**72**
	Time (in seconds)								
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	46	51	57
16	22	24	39	34	40	46	52	58	67
18	25	27	32	38	45	52	59	65	73
20	28	30	35	42	50	53	65	72	81
22	31	33	39	46	55	64	72	79	89
24	33	36	42	51	59	64	78	87	97
26	36	39	46	55	64	75	85	94	105
28	39	42	49	59	69	81	91	101	113
30	42	45	53	63	74	87	98	108	121

Test Information

Depth of Manhole (in feet & inches) _____ Diameter of Manhole (in inches) _____

Allowable time for drop to 9-inches of Hg _____

Actual time for drop to 9-inches of Hg _____

Test Results

Passed (actual time > allowable time) _____ **Failed** (allowable time > actual time) _____

15.254

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.8 Application for Crossing Water Transmission Mains

Applicant Name: _____ Date: _____

Address: _____

_____

_____

Telephone Number: _____ Fax Number: _____

Cellular Number: _____ Other Number: _____

Project Engineer Name: _____

Address: _____

_____

_____

Telephone Number: _____ Fax Number: _____

Cellular Number: _____ Other Number: _____

Address: _____

_____

_____

Location of Project: _____

_____

_____

Type of Crossing: _____

_____

_____

_____

_____

Springfield Water and Sewer Commission

Guidelines and Policies

Other Alternatives Reviewed: _____

_____

_____

_____

_____

Attachments:	**Yes**	**No**
Signed/Stamped Plans:	_____	_____
Location Maps:	_____	_____
Project Description:	_____	_____
Material Specifications:	_____	_____
Permitting Requirements:	_____	_____
Other:	_____	_____

By Commission:

Reviewer's Name: _____ Date: _____

	Yes	**No**
Crossing less than 18-inches below Grade ($1,500)	_____	_____
Crossing greater than 18-inches below Grade ($5000)	_____	_____
Crossing Under Transmission Main ($10,000)	_____	_____

Reviewer's Comments: _____

_____

_____

_____

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.9 Fire Flow Test Form

STATIC & RESIDUAL HYDRANT:		
HYD#: TYPE: MAIN SIZE:		
STREET NAME		
LOCATION		
PRESSURE	GAUGE	OBSERVER
STATIC		
RESIDUAL		

DATE _____

TIME _____

TEMP. _____

WEATHER _____

WO # _____

FLOW HYDRANT(S):

HYDRANT NUMBER, TYPE, STREET NAME, AND LOCATION	MAIN SIZE IN INCHES	GAUGE NUMBER	NOZZLE SIZE IN INCHES	NUMBER OF NOZZLES	NOZZLE COEFFICIENT (0.9, 0.8, OR 0.7)	PITO READING OR PRESSURE IN PSI	FLOW IN GPMS	OBSERVER

FIRE FLOW TEST RESULTS

FLOW DURING TEST _____ in GPM **TIME FLOWED _____ in minutes**

AVAILABLE @ 20 PSI _____ in GPM **TOTAL FLOWED _____ in gallons**

REMARKS: _____

SPRINGFIELD WATER & SEWER INSPECTOR: _____

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.10 Fire Flow Discharge Table – Coefficient of Nozzle (C) = 0.9

Note: all discharges in Gallons per Minute (GPM) and all flows rounded to nearest GPM

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
1	151	160	168	176	185	544
2	214	226	237	249	262	769
3	262	276	291	305	320	942
4	303	319	336	353	370	1087
5	339	357	375	394	414	1216
6	371	391	411	432	453	1332
7	401	422	444	466	489	1438
8	428	451	475	499	523	1538
9	454	479	503	529	555	1631
10	479	504	531	557	585	1719
11	502	529	557	585	614	1803
12	525	553	581	611	641	1883
13	546	575	605	636	667	1960
14	567	597	628	660	692	2034
15	587	618	650	683	716	2106
16	606	638	671	705	740	2175
17	624	658	692	727	763	2242
18	642	677	712	748	785	2307
19	660	695	731	768	806	2370
20	677	713	750	788	827	2431
22	710	748	787	827	868	2550
24	742	781	822	864	906	2663
26	772	813	856	899	943	2772
28	801	844	888	933	979	2877
30	829	874	919	966	1013	2978
32	857	902	949	997	1046	3075
34	883	930	978	1028	1079	3170
36	909	957	1007	1058	1110	3262
38	934	983	1034	1087	1140	3351
40	958	1009	1061	1115	1170	3438
42	981	1034	1087	1142	1199	3523
44	1004	1058	1113	1169	1227	3606
46	1027	1082	1138	1196	1255	3687
48	1049	1105	1163	1221	1282	3767
50	1071	1128	1186	1247	1308	3844
52	1092	1150	1210	1271	1334	3920

C=0.09

Springfield Water and Sewer Commission

Guidelines and Policies

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
54	1113	1172	1233	1295	1359	3995
56	1133	1194	1256	1319	1384	4068
58	1153	1215	1278	1343	1409	4140
60	1173	1236	1300	1366	1433	4211
62	1192	1256	1321	1388	1457	4281
64	1211	1276	1342	1410	1480	4349
66	1230	1296	1363	1432	1503	4417
68	1249	1315	1384	1454	1525	4483
70	1267	1335	1404	1475	1548	4549
72	1285	1353	1424	1496	1570	4613
74	1303	1372	1443	1516	1591	4677
76	1320	1391	1463	1537	1613	4739
78	1337	1409	1482	1557	1634	4801
80	1354	1427	1501	1577	1655	4863
82	1371	1444	1519	1596	1675	4923
84	1388	1462	1538	1616	1695	4983
86	1404	1479	1556	1635	1716	5042
88	1421	1496	1574	1654	1735	5100
90	1437	1513	1592	1672	1755	5158
92	1453	1530	1609	1691	1774	5215
94	1468	1546	1627	1709	1794	5271
96	1484	1563	1644	1727	1813	5327
98	1499	1579	1661	1745	1831	5382
100	1514	1595	1678	1763	1850	5437
102	1529	1611	1695	1780	1868	5491
104	1544	1627	1711	1798	1887	5544
106	1559	1642	1728	1815	1905	5597
108	1574	1658	1744	1832	1922	5650
110	1588	1673	1760	1849	1940	5702
112	1603	1688	1776	1866	1958	5753
114	1617	1703	1792	1882	1975	5805
116	1631	1718	1807	1899	1992	5855
118	1645	1733	1823	1915	2010	5906
120	1659	1747	1838	1931	2026	5955
122	1673	1762	1853	1947	2043	6005
124	1686	1776	1868	1963	2060	6054
126	1700	1790	1883	1979	2077	6102
128	1713	1805	1898	1994	2093	6151
130	1727	1819	1913	2010	2109	6199

C = 0.9

15.259

Springfield Water and Sewer Commission

Guidelines and Policies

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
132	1740	1833	1928	2025	2125	6246
134	1753	1846	1942	2041	2141	6293
136	1766	1860	1957	2056	2157	6340
138	1779	1874	1971	2071	2173	6386
140	1792	1887	1985	2086	2189	6433
142	1805	1901	1999	2101	2204	6478
144	1817	1914	2014	2115	2220	6524
146	1830	1927	2027	2130	2235	6569
148	1842	1941	2041	2145	2251	6614
150	1855	1954	2055	2159	2266	6658
152	1867	1967	2069	2173	2281	6703
154	1879	1979	2082	2188	2296	6747
156	1891	1992	2096	2202	2311	6790
158	1903	2005	2109	2216	2325	6834
160	1916	2018	2122	2230	2340	6877

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.11 Fire Flow Discharge Table – Coefficient of Nozzle = 0.8

Note: all discharges in Gallons per Minute (GPM) and all flows rounded to nearest GPM

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
1	135	142	149	157	164	483
2	190	201	211	222	233	683
3	233	246	258	271	285	837
4	269	284	298	313	329	966
5	301	317	334	350	368	1081
6	330	347	365	384	403	1184
7	356	375	395	415	435	1279
8	381	401	422	443	465	1367
9	404	425	447	470	493	1450
10	426	448	472	496	520	1528
11	446	470	495	520	545	1603
12	466	491	517	543	570	1674
13	485	511	538	565	593	1742
14	504	531	558	586	615	1808
15	521	549	578	607	637	1872
16	538	567	597	627	658	1933
17	555	585	615	646	678	1992
18	571	602	633	665	698	2050
19	587	618	650	683	717	2106
20	602	634	667	701	735	2161
22	631	665	700	735	771	2267
24	659	695	731	768	806	2367
26	686	723	761	799	838	2464
28	712	750	789	829	870	2557
30	737	777	817	858	901	2647
32	761	802	844	886	930	2734
34	785	827	870	914	959	2818
36	808	851	895	940	987	2899
38	830	874	919	966	1014	2979
40	851	897	943	991	1040	3056
42	872	919	967	1016	1066	3132
44	893	941	989	1039	1091	3205
46	913	962	1012	1063	1115	3278
48	933	982	1033	1086	1139	3348
50	952	1003	1055	1108	1163	3417
52	971	1022	1076	1130	1186	3485

C = 0.8

Springfield Water and Sewer Commission

Guidelines and Policies

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
54	989	1042	1096	1152	1208	3551
56	1007	1061	1116	1173	1231	3616
58	1025	1080	1136	1193	1252	3680
60	1043	1098	1155	1214	1274	3743
62	1060	1116	1174	1234	1295	3805
64	1077	1134	1193	1254	1316	3866
66	1094	1152	1212	1273	1336	3926
68	1110	1169	1230	1292	1356	3985
70	1126	1186	1248	1311	1376	4043
72	1142	1203	1266	1330	1395	4100
74	1158	1220	1283	1348	1415	4157
76	1173	1236	1300	1366	1434	4213
78	1189	1252	1317	1384	1452	4268
80	1204	1268	1334	1402	1471	4322
82	1219	1284	1351	1419	1489	4376
84	1234	1299	1367	1436	1507	4429
86	1248	1315	1383	1453	1525	4481
88	1263	1330	1399	1470	1543	4533
90	1277	1345	1415	1487	1560	4584
92	1291	1360	1431	1503	1577	4635
94	1305	1375	1446	1519	1594	4685
96	1319	1389	1461	1535	1611	4735
98	1333	1404	1477	1551	1628	4784
100	1346	1418	1492	1567	1644	4832
102	1359	1432	1506	1583	1661	4881
104	1373	1446	1521	1598	1677	4928
106	1386	1460	1536	1613	1693	4975
108	1399	1473	1550	1628	1709	5022
110	1412	1487	1564	1643	1725	5068
112	1425	1501	1578	1658	1740	5114
114	1437	1514	1592	1673	1756	5160
116	1450	1527	1606	1688	1771	5205
118	1462	1540	1620	1702	1786	5249
120	1475	1553	1634	1717	1801	5294
122	1487	1566	1647	1731	1816	5338
124	1499	1579	1661	1745	1831	5381
126	1511	1592	1674	1759	1846	5424
128	1523	1604	1687	1773	1860	5467
130	1535	1617	1701	1787	1875	5510

C = 0.8

Springfield Water and Sewer Commission

Guidelines and Policies

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
132	1547	1629	1714	1800	1889	5552
134	1558	1641	1727	1814	1904	5594
136	1570	1653	1739	1827	1918	5636
138	1581	1666	1752	1841	1932	5677
140	1593	1678	1765	1854	1946	5718
142	1604	1690	1777	1867	1960	5759
144	1615	1701	1790	1880	1973	5799
146	1626	1713	1802	1893	1987	5839
148	1638	1725	1814	1906	2000	5879
150	1649	1737	1827	1919	2014	5919
152	1660	1748	1839	1932	2027	5958
154	1670	1760	1851	1945	2041	5997
156	1681	1771	1863	1957	2054	6036
158	1692	1782	1875	1970	2067	6074
160	1703	1793	1887	1982	2080	6113

C = 0.8

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.12 Fire Flow Discharge Table – Coefficient of Nozzle = 0.7

Note: all discharges in Gallons per Minute (GPM) and all flows rounded to nearest GPM

Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
1	118	124	131	137	144	423
2	167	175	185	194	203	598
3	204	215	226	237	249	732
4	236	248	261	274	288	846
5	263	277	292	307	322	945
6	289	304	320	336	352	1036
7	312	328	345	363	381	1119
8	333	351	369	388	407	1196
9	353	372	392	411	432	1269
10	372	392	413	434	455	1337
11	391	411	433	455	477	1402
12	408	430	452	475	498	1465
13	425	447	471	494	519	1525
14	441	464	488	513	538	1582
15	456	480	505	531	557	1638
16	471	496	522	548	576	1691
17	486	512	538	565	593	1743
18	500	526	554	582	610	1794
19	513	541	569	598	627	1843
20	527	555	584	613	643	1891
22	552	582	612	643	675	1983
24	577	608	639	672	705	2071
26	601	633	665	699	734	2156
28	623	656	691	726	761	2237
30	645	680	715	751	788	2316
32	666	702	738	776	814	2392
34	687	723	761	800	839	2466
36	707	744	783	823	863	2537
38	726	765	804	845	887	2607
40	745	785	825	867	910	2674
42	763	804	846	889	932	2740
44	781	823	866	910	954	2805
46	799	841	885	930	976	2868
48	816	860	904	950	997	2930
50	833	877	923	970	1017	2990
52	849	895	941	989	1038	3049
54	866	912	959	1008	1057	3107

C = 0.7

Springfield Water and Sewer Commission

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Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
56	881	928	977	1026	1077	3164
58	897	945	994	1044	1096	3220
60	912	961	1011	1062	1115	3275
62	927	977	1028	1080	1133	3329
64	942	993	1044	1097	1151	3383
66	957	1008	1060	1114	1169	3435
68	971	1023	1076	1131	1186	3487
70	985	1038	1092	1147	1204	3538
72	999	1053	1107	1163	1221	3588
74	1013	1067	1123	1179	1238	3637
76	1027	1082	1138	1195	1254	3686
78	1040	1096	1153	1211	1271	3734
80	1053	1110	1167	1226	1287	3782
82	1067	1123	1182	1242	1303	3829
84	1079	1137	1196	1257	1319	3875
86	1092	1151	1210	1272	1334	3921
88	1105	1164	1224	1286	1350	3967
90	1117	1177	1238	1301	1365	4011
92	1130	1190	1252	1315	1380	4056
94	1142	1203	1265	1329	1395	4100
96	1154	1216	1279	1343	1410	4143
98	1166	1228	1292	1357	1424	4186
100	1178	1241	1305	1371	1439	4228
102	1190	1253	1318	1385	1453	4270
104	1201	1265	1331	1398	1467	4312
106	1213	1277	1344	1412	1481	4353
108	1224	1289	1356	1425	1495	4394
110	1235	1301	1369	1438	1509	4435
112	1246	1313	1381	1451	1523	4475
114	1258	1325	1393	1464	1536	4515
116	1269	1336	1406	1477	1550	4554
118	1279	1348	1418	1489	1563	4593
120	1290	1359	1430	1502	1576	4632
122	1301	1370	1441	1514	1589	4670
124	1312	1382	1453	1527	1602	4709
126	1322	1393	1465	1539	1615	4746
128	1333	1404	1477	1551	1628	4784
130	1343	1415	1488	1563	1641	4821
132	1353	1425	1499	1575	1653	4858

C = 0.7

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Diameter of Nozzle	2-3/8-inch	2-7/16-inch	2-1/2-inch	2-9/16-inch	2-5/8-inch	4-1/2-inch
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
134	1363	1436	1511	1587	1666	4895
136	1374	1447	1522	1599	1678	4931
138	1384	1457	1533	1611	1690	4967
140	1394	1468	1544	1622	1702	5003
142	1404	1478	1555	1634	1715	5039
144	1413	1489	1566	1645	1727	5074
146	1423	1499	1577	1657	1739	5109
148	1433	1509	1588	1668	1750	5144
150	1443	1519	1598	1679	1762	5179
152	1452	1530	1609	1690	1774	5213
154	1462	1540	1620	1702	1786	5247
156	1471	1550	1630	1713	1797	5281
158	1480	1559	1640	1723	1809	5315
160	1490	1569	1651	1734	1820	5349

C = 0.7

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.13 Values for Pressures Raised to the .54 Power

PSI	PSI RAISED TO THE .54 POWER	PSI	PSI RAISED TO THE .54 POWER	PSI	PSI RAISED TO THE .54 POWER	PSI	PSI RAISED TO THE .54 POWER
1	1.00	41	7.43	81	10.73	121	13.33
2	1.45	42	7.53	82	10.80	122	13.39
3	1.81	43	7.62	83	10.87	123	13.44
4	2.11	44	7.72	84	10.94	124	13.50
5	2.38	45	7.81	85	11.01	125	13.56
6	2.63	46	7.90	86	11.08	126	13.62
7	2.86	47	8.00	87	11.15	127	13.68
8	3.07	48	8.09	88	11.22	128	13.74
9	3.28	49	8.18	89	11.29	129	13.79
10	3.47	50	8.27	90	11.36	130	13.85
11	3.65	51	8.36	91	11.43	131	13.91
12	3.83	52	8.45	92	11.49	132	13.97
13	4.00	53	8.53	93	11.56	133	14.02
14	4.16	54	8.62	94	11.63	134	14.08
15	4.32	55	8.71	95	11.69	135	14.14
16	4.47	56	8.79	96	11.76	136	14.19
17	4.62	57	8.88	97	11.83	137	14.25
18	4.76	58	8.96	98	11.89	138	14.31
19	4.90	59	9.04	99	11.96	139	14.36
20	5.04	60	9.12	100	12.02	140	14.42
21	5.18	61	9.21	101	12.09	141	14.47
22	5.31	62	9.29	102	12.15	142	14.53
23	5.44	63	9.37	103	12.22	143	14.58
24	5.56	64	9.45	104	12.28	144	14.64
25	5.69	65	9.53	105	12.34	145	14.69
26	5.81	66	9.61	106	12.41	146	14.75
27	5.93	67	9.68	107	12.47	147	14.80
28	6.05	68	9.76	108	12.53	148	14.86
29	6.16	69	9.84	109	12.60	149	14.91
30	6.28	70	9.92	110	12.66	150	14.97
31	6.39	71	9.99	111	12.72	151	15.02
32	6.50	72	10.07	112	12.78	152	15.07
33	6.61	73	10.14	113	12.84	153	15.13
34	6.71	74	10.22	114	12.90	154	15.18
35	6.82	75	10.29	115	12.97	155	15.23
36	6.92	76	10.37	116	13.03	156	15.29
37	7.03	77	10.44	117	13.09	157	15.34
38	7.13	78	10.51	118	13.15	158	15.39
39	7.23	79	10.59	119	13.21	159	15.44
40	7.33	80	10.66	120	13.27	160	15.50

Springfield Water and Sewer Commission

Guidelines and Policies

CHAPTER 16 CROSSING COMMISSION TRANSMISSION MAINS, EASEMENTS, OR PROPERTY

16.1.1 Description of Commission Transmission Mains

The following general descriptions of the three Transmission Mains are as follows:

1. BETWEEN WEST PARISH FILTRATION PLANT AND PROVIN MOUNTAIN:

   (a) 42" Lock Bar Riveted Steel pipe, seven miles long, (1909) either 3/8" or 5/16" plate. Cement lined in 1960.

   (b) 51 5/8" Welded Steel pipe [12,500 feet], fabricated from smaller sizes with Dresser Coupling Joints (1943) generally less than 1" wall thickness. Remainder of this main is 48" Welded Steel pipe [25,900 feet] with Dresser Coupling Joints (1948)

   (c) 60" Lock Joint Prestressed Cylinder Pipe [39,000 feet] (1963) with 6" concrete wall.

2. BETWEEN PROVIN MOUNTAIN AND SPRINGFIELD:

   (a) 42" Lock Bar Riveted Steel pipe five miles long through Agawam and West Springfield (1909) either 3/8" or 5/16" plate. Cement lined in 1960.

   (b) 48" [2.5-miles] and 54" [3.4-miles] of Vianini Pre-Stressed Concrete Cylinder with push-on joints and about 6" wall thickness installed 2014 and [0.3-miles] of Electrically Welded Steel pipe with riveted girth generally less than 1" wall thickness installed in 1928 and C&L in 2014. The Right of Way through Agawam is owned by the Commission.

   (c) 60" Lock Joint Prestressed Cylinder Pipe five miles long through Agawam and West Springfield (1957) with 6" concrete wall. The right of way for this Main is generally thirty feet.

16.1.2 Application Procedure for Crossing Commission Transmission Mains

1. The Applicant should contact the Commission's Engineering and Technical Services indicating the location and general nature of the proposed crossing. This initial contact should include why this crossing is needed and should discuss what other locations or alternatives have been investigated which would be possible without the necessity of crossing the Commission's transmission mains, easements, or property.

2. In the event that the Applicant wishes to pursue the proposal, the Applicant will be required to complete the Application for Crossing Commission Transmission Mains, Easements, or Property, attached in Section 15.1.8 of these Guidelines and Policies. Payment of the application fee does not ensure that the proposed project will be approved by the Commission.

3. The following information will be required by the Application for Crossing Transmission Mains, Easements, and Property:

   (a) Nature of the request including type of utility crossing, whether above or below the grade of the Transmission Main(s), type of material, sizes, and other pertinent information.

   (b) Location maps, preferably Assessors Maps and USGS topographic maps, indicating the property in question for the crossing.

   (c) Plan and profile, if available, showing relationship between Transmission Main(s) and proposed crossing and details of access to and use of Commission Property or easement and how said property or easement and transmissions main(s) shall be protected.

   (d) Names, addresses, telephone and fax numbers of Applicant and Project Engineer.

   (e) Discussion why Commission property or easements must be crossed and what other alternatives have been investigated by the Applicant which do not include crossing of the Commission's Transmission Mains.

16.1.3 Submittals Required to Crossing Commission Transmission Mains

1. The Applicant for Crossing of Commission Transmission Mains, Easements, or Property must submit a Proposed Site Plan(s) for review, comments, and potential approval by the Commission.

2. The Commission reviews Proposed Site Plan(s) and other plan(s), as appropriate to determine compliance with Commission Rules and Regulations, the Guidelines and Policies, and the Commission's Material Specifications.

3. The Applicant's engineer may contact the Commission for copies of records of existing water and sewer mains and services.

4. The Commission needs one (1) Proposed Site Plan for draft review and comment and after the draft is approved, five (5) Final Site Plans shall be submitted.

5. A License Agreement(s), according to the Commission's Rules and Regulations shall be submitted after the Final Site Plan has been approved and before access or construction can begin.

6. The Commission, at its discretion, may require additional design requirements based on site conditions, capacity issues, existing infrastructure materials, and/or other unknown conditions.

7. No work or access shall commence prior to, or without, the written approval of the Commission. All approvals are solely at the discretion of the Commission.

16.1.4 Minimum Design Standards Required to Cross Commission Transmission Mains

1. Applicants will be required to dig test pits, witnessed by Commission Inspectors, to determine the actual location and depths of main(s).

2. Soil borings may also be required to determine the actual site conditions. Crossings, which involve all three of the Commission's Transmission Mains, shall be held to a higher standard to maintain structural integrity due to the potential for more catastrophic consequences of any failures.

3. Because of the Commission's requirement for clearance between the Transmission Mains and any other utility piping (as specified below) and because of the generally shallow cover (3-feet to 6-feet) over the Mains, the following requirements assume that all crossings are below the Transmission Mains. In certain site-specific locations, crossings may be technically possible above the Transmission Mains and would be reviewed by the Commission subject to the applicable requirements below; as well as, any other limitations pertinent to that site. The requirements listed below assume that all crossings are to be jacked; however, micro tunneling can be a viable option for Applicants to consider in some situations.

   (a) Prior to the commencement of work, the contractor will be required to hire an experienced civil/geotechnical engineer to design the entire jacking operation, to include the dewatering design of the jacking and receiving pits, the steel sleeve, the jacks, the loads on the reaction box and the installation schedule. This design shall be submitted to the Commission on a stamped plan prior to the commencement of work.

   (b) The Commission shall require that the following requirements be incorporated into bidding specifications and construction plans as appropriate:

   (c) The Commission shall require all crossings to be jacked or micro tunneled under the water Transmission Mains.

(d) All sewer and water pipes shall be installed in a steel casting sleeve jacked beneath the water Transmission Mains. The contractor shall be required to perform any additional test pits as required at both sides of the casing sleeve to ensure familiarity with the soil and to determine the actual horizontal and vertical control and to locate any additional utilities which might be in the area. Based on the test pit results, the contractor shall adjust the alignment of the sleeve in the field to avoid any interference with the existing water lines or other utilities. The contractor shall determine the maximum clearance possible between the top of the steel sleeve and the actual bottom of the existing water Transmission Mains. Any potential field adjustments shall be reported to the Commission prior to commencing with the jacking operation.

(e) The Commission requires a minimum of two (2) feet clearance between the top of the steel casing and the bottom of a Transmission Main. The Commission would prefer that any jacking under all three mains be conducted on the side of the main with the least amount of clearance.

(f) Specifications for the work should include requiring the contractor to install sufficient dewatering wells to lower the groundwater at least two feet below the invert of the jacked sleeve. Observation wells need to be included to ensure that this is accomplished. It is important to ensure that materials are not washed into the proposed steel sleeve during installation. This could result in voids, ultimate settlement of the water mains, and potential rupture.

(g) Before any work is begun within the limits of jacking, the contractor shall have assembled all material, tools and equipment which will be required. The Commission, local DPW, Town or City Engineers, abutters, and other interested parties shall be notified at least 72 hours, excluding weekends and holidays, prior to jacking so that representatives can be present during the jacking operation. When the contractor has started the jacking operation, the contractor will proceed in a continuous operation without stopping until the casing sleeve installation is complete.

(h) Steel sleeve shall meet or exceed ASTM A252 Grade 2 and welded with AWS D1.1 Standards. The steel in the pipe must meet or exceed 35,000 psi minimum yield strength, and 60,000 psi minimum tensile strength. Pipe shall be in 20’ 0” lengths beveled for welding and square end cut. Contractor shall submit pipe manufacturer certification to the Commission for review.

(i) Sewer pipe shall meet requirements of AWWA C151 (Hub type) and gasket material shall meet AWWA C111 (Similar to American Fastite Joint pipe). Contractor shall submit to the Commission for review.

(j) The contractor must use extreme caution when working around the existing Transmission Mains. Transmission Mains shall be protected from possible

damage from contractors equipment. Crossing the mains with equipment is to be minimized and only with one inch, or greater, thick steel construction plates with a minimum size of 8' by 10' or other approved means of distributing loads shall be used to prevent heavy loads being placed directly on the pipelines. Extra heavy equipment may require removable concrete pads over the Main(s) as may be required by the Commission's Engineer. Any such crossing areas shall not be construed as a "construction highway" to other areas of the project.

(k) The Applicant shall obtain from the appropriate local community Public Works Director or Engineer assurance that the proposed sewer or water main is sized to meet reasonably expected future demands. The purpose of this requirement is to ensure that another crossing of the Transmission Mains in the immediate area will not be required because of additional growth or subsequent subdivisions.

(l) No construction, temporary work or grade changes shall be permitted on Commission property or easements unless and until a License Agreement is executed between the Commission and the Applicant.

(m) Gravity sewers crossing under the Transmission Mains shall have concrete manhole structures constructed at the terminus of each end of the steel casing sleeve with suitable joint sealants and connections as designed by a Registered Professional Engineer. Suitable seals shall be provided around the pipes inside the manholes to prevent any liquids from "piping" around the casing sleeve under the Transmission Mains from the manhole. It is the preference that these manholes be constructed outside the property line or easement boundary where practical.

(n) Gravity sewer lines may be shimmed to final plan grade and elevation by use of pressure treated lumber secured to the ductile iron pipe on four sides with steel bands. Flowable grout fill in a continuous pour shall be injected into the steel casing to fill all voids between the steel casing and the sewer pipe.

(o) The Commission would prefer that pressurized sewers and water pipes not cross over, or under, its Transmission Mains due to the accelerated damages possible in the event of failure. The Commission reserves the right to institute stricter controls for these utility types.

(p) Water mains crossing under the Transmission Mains shall have suitable valves located adjacent to the Commission's property line or easement boundary to allow for prompt shutdown in any future emergency. The intent is to lessen the flow from a third parties water main leak or rupture as promptly as possible to avoid total undermining of the Transmission Mains and catastrophic failure. Flowable grout fill in a continuous pour shall be injected into the steel casing to fill all voids between the steel casing and the ductile iron water pipe.

Springfield Water and Sewer Commission

Guidelines and Policies

(q) In the event that rock or other obstructions hinder the advancement of the casing, the auger shall be removed and a manual attempt to remove the obstruction will be made. If it is determined that it is either unwise or impossible to remove an obstruction, the casing shall be filled with concrete grout and abandoned.

(r) These guidelines have neither been approved by the Commissioners nor should they be construed as amending or altering the Policy adopted by the Commissioners relative to this issue. These guidelines are meant to provide additional initial guidance to prospective Applicants and indicate the types of specific requirements which will be incorporated into any approvals for such crossings, including any Plans and Specifications developed by Project Applicants' Engineer(s). All parties to any crossing shall note that all approvals for crossings are made at the sole discretion of the Commission.

(s) Upon receipt of the formal request for access as outlined in the "Procedure" section of the Commission Policy, the Commission will furnish location plan of Transmission Main(s) in question with approximate depth(s).

Springfield Water and Sewer Commission

Guidelines and Policies

DOCUMENT A00886

SPRINGFIELD WATER AND SEWER COMMISSION

DRAFT LICENSE

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Springfield Water and Sewer Commission

Guidelines and Policies

LICENSE AGREEMENT
SANITARY SEWER MAIN EXTENSION
AND/OR
WATER MAIN EXTENSION

Revised October 3,2007

Agreement made this _____day of _____ 2008 by and between the SPRINGFIELD WATER AND SEWER COMMISSION (hereinafter referred to as the "COMMISSION"), a body politic incorporate and political subdivision of the Commonwealth of Massachusetts, with its offices at the 250 M St. Ext., Agawam, MA 01001, and

_____

(herein after referred to as "OWNER").

WHEREAS, the Owner has applied to the Commission for permission to construct the following;

- _____length in feet of 8-inch diameter Sanitary Sewer Main,
- _____length in feet of 10-inch diameter Sanitary Sewer Main,
- _____length in feet of 12-inch diameter Sanitary Sewer Main,
- _____length in feet of ___-inch diameter Sanitary Sewer Main,

and associated structures, as shown on the Plan and Profile entitled:

"_____",

Scale: 1 inch = ___ feet Date: _____, 200_, ___ revision ,

Prepared by: _____,

_____ said Plan and Profile being on file with the Commission.

WHEREAS, the Owner has applied to the Commission for permission to construct the following,

- _____length in feet of 6-inch diameter Water Main,
- _____length in feet of 8-inch diameter Water Main,
- _____length in feet of 12-inch diameter Water Main,
- _____length in feet of ___-inch diameter Water Main,
- _____tons of asphalt for paving restoration,

and associated structures, as shown on the Plan and Profile entitled:

"_____",

Scale: 1 inch = ___ feet Date: _____, 200_, ___ revision ,

Prepared by: _____,

_____ said Plan and Profile being on file with the Commission.

Springfield Water and Sewer Commission

Guidelines and Policies

NOW, THEREFORE, in consideration of the grant of this license, the Owner agrees that the installation works shall comply with the Commission's latest version of the Rules and Regulations, Guidelines, Policies, and Specifications; and also meet the following key requirements:

1. To install said work in accordance with the approved Plans reviewed by the Commission.
2. To hire a Commission Approved Contractor(s) to install said work.
3. To notify the Commission a minimum of forty-eight (48) hours prior to commencing any activity, which requires Commission inspections and/or assistance.
4. To ensure all work requiring inspection gets inspected by a representative of the Commission.
5. To begin the installation of sewer and/or water pipe(s) called for on said Plans and Specifications, no later than two calendar years from date of Commission approval of said plans and specifications.
6. To indemnify, defend, and hold harmless the Commission, and all of its officers, agents and/or employees against all suits, claims or liability of every name and nature, for/or on account of any injuries to persons or damage to property arising out of, or in consequence of, any acts of the Owner in the performance of the work covered by this Agreement, whether by it/themselves, or its/their employees and/or sub-contractors, in respect of such injuries or damages sustained during the performance of, prior to the completion and acceptance of the installation, damage to property due to the Owner's construction means and methods, and restoration of property impacted by the Owner's performance of the work covered by this Agreement.
7. By entering into this License Agreement, the Commission makes no representation and grants no privileges or permits to the Owner to enter any private way for the purpose of installing said sanitary sewer and/or water main.
8. Any easements required for the construction, and / or continued operation of water and/or sewer main extensions shall be secured by the Owner, reviewed, and approved as to form and extents by the Commission as part of the License Agreement. Any easements through private property shall be in the name of the Owner during the construction and warranty period. Easements shall be recorded at the Hampden County Registry of deeds. After all mains are approved by the Commission, have completed the warranty period, and have been accepted by the Commission, shall be deeded to the Commission by the Owner. That deed shall be recorded in the Hampden County Registry of Deeds.

Springfield Water and Sewer Commission

Guidelines and Policies

9. The following shall apply with respect to both water and/or sewer main extensions:

   (a) A main is approved for use, when the installation of a Public Water Main and/or Public Sewer main has been properly installed, completed, and passed all required inspections and tests according to the Commission's Guidelines and Policies.

   (b) A main is accepted, and become property of the Commission, only after the main installation of a Public Water Main and/or Public Sewer main has been approved for use, the warranty period has ended, and the Commission has received the "As-Built' plans in according with the Commission's Guidelines and Policies and any other required certification.

10. To furnish surety for Performance/Payment Bond and Maintenance Bond in the form of a Bond, Letter of Credit, or other Commission approved financial guarantee, made payable to the Springfield Water and Sewer Commission,

Description of Surety

Performance / Payment Bond (during construction period until all mains approved), in the amount of _____ dollars.

_____ Bond No. _____ – _____ Company.
(Bond Number & Surety Company)

Description of Surety

Maintenance Bond (after construction period from time of all main approvals until end of warranty period – one-year minimum), in the amount of _____

_____

_____ dollars.

+

(Bond Number & Surety Company)

NOTE: Originals of sureties shall be attached as part of this License Agreement for the Commission.

Springfield Water and Sewer Commission

Guidelines and Policies

11. Building sewer connection and sanitary main testing shall proceed as per the Commission's Guidelines and Policies, with key tasks summarized as follows:

    (a) The sanitary main shall be extended from the existing or proposed sanitary manhole at the existing public collection system. The connection between public and private systems shall be plugged until approved by the Commission. Sanitary Wyes for Building Sewer Connections shall be installed integral with the main line construction.

    (b) Sanitary building sewer connections shall be stubbed out to street line, capped, braced, and marked at grade level so that all required testing procedures may occur. No Building Sewer Connections may be completed and tied into a service location until the sewer has passed all testing requirements and main is approved in writing by the Commission.

    (c) Upon completion of the sanitary sewer and service stubs, said sewer shall be tested for infiltration-exfiltration (pressure test).

    (d) A closed circuit television inspection of the sewer main shall be completed after the successful completion of the infiltration-exfiltration testing. Documentation of the results shall be submitted to the Commission by the Owner.

    (e) Upon successful completion of all requirements above and as stated in the Commission's Rules and Regulations, Guidelines, and Policies, the sanitary main extension shall be approved for final connection with Building Sewer Connections. No service connections will be allowed to homes / buildings until the sanitary main is approved for use in writing by the Commission

12. Water main testing shall proceed as per the Commission's Guidelines and Policies, with key tasks summarized as follows.

    (a) Upon completion of the water main installation, said water main shall be tested for leaks (pressure test) prior to approval by the Commission.

    (b) Upon successful completion of the leakage test, the water main shall be disinfected with liquid chlorine, flushed, and shall successfully pass two consecutive bacterial tests prior to approval of the water main by the Commission.

    (c) Upon successful completion of all requirements above and as stated in the Commission's Rules and Regulations, Guidelines and Policies, the water main extension shall be approved for final connection with Water Services to buildings.

Springfield Water and Sewer Commission

Guidelines and Policies

13. In the event of a failure of water and/or sewer mains under any required testing, the Owner shall direct their contractor to remove and reinstall defective pipes and/or other system components and retest. All installation, repairs, and retesting shall take place at the Owner's expense.

14. If the Owner, or its contractor(s), fails to take needed prompt or corrective action during installation of the sewer and/or water pipe (in the opinion of the Executive Director of the Commission or authorized designees), the Commission shall make all repairs necessary or cause the same to be made. The cost for such repairs shall be paid by the Owner.

15. Upon successful completion of all sewer and water main testing requirements and approval of the water and sewer mains by the Commission, a minimum one year warranty period shall commence. If during the warranty period, defects become apparent, the Owner shall direct their contractor to effect repairs and replacements of defective pipes and other system components. Repairs and re-testing shall be required at the discretion of the Commission. The one year warranty period shall restart at the time of the completion of those repairs.

IN WITNESS WHEREOF, the Springfield Water and Sewer Commission and Owner have executed this Agreement on the day and year first above written.

SPRINGFIELD WATER AND SEWER COMMISSION:

_____	_____
Owner Signature	**Executive Director Signature**
_____	_____
_____	
Print Name and Title	**Print Name**
_____	_____
Print Date	**Print Date**
_____	250 M Street Extension, Agawam, MA 01001
Print Address	**Print Address**
_____	413-787-6256
Print Telephone Number	**Print Telephone Number**

Attachments: Performance / Payment Bond – By Owner
Maintenance Bond – By Owner

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BRICK SEWER CONDITION ASSESSMENT REPORT

(Provided for informational purposes only and to be used by the Contractor at their own risk.)

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Overland Engineering, LLC
100 Hallet St., Boston
Tel. 617-265-4547
bleclair@ovrleng.com

Project

Project	MassDOT PFN_ 609409
	10/30/2025

Client

Name	Tetra Tech
	Alison Lima
	100 Nickerson Rd.
City	Marlborough
	508-786-2200

Remarks

The following sewer condition assessment report is for a 55" x 48" concrete and brick arch combined sewer interceptor pipe owned and operated by Springfield Water & Sewer and residing within CSX ROW property line limits below Armory Street Bridge within the City of Springfield, MA. The inspection spans from SMH 3811 to approx. 319' downstream heading west along the CSX ROW property line. The interceptor was found to be in good condition with relatively minor difficiencies.

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MassDOT PFN_ 609409		**10/30/2025**

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Section Summary P-2

Section: 1; SMH - 3811 - SMH - 3805 1

OVERLAND

Overland Engineering, LLC
100 Hallet St., Boston
Tel. 617-265-4547
bleclair@ovrleng.com

Legend of Classification (Section)

Project	
MassDOT PFN_ 609409	**10/30/2025**

1:	Excellent Condition Minor Defects- Failure unlikley in the foreseeable future
2:	Good Condition Defects that have not begun to deteriorate- Pipe unlikely to fail for at least 20 years.
3:	Fair Condition Moderate defects that will continue to deteriorate- Pipe may fail in 10-20 years.
4:	Poor Condition Severe Defects that will become Grade 5 defects within the foerseeable future- Pipe will probably fail in 5-10 years
5:	Immediate Attention Defects require immediate attention- Pipe has failed or will likely fail within the next 5 years or sooner.

OVERLAND

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Section Summary

Project	
MassDOT PFN_ 609409	**10/30/2025**

Number of sections	1
Total length of sections	319.30 ft
Total length of inspected sections	319.30 ft
Total length of not inspected sections	0.00 ft
Total abandoned inspections	1
Number of section inspection photos	15
Number of section inspection videos	1
Number of section inspection scans	0
Number of section inclination measurements	0

Pipe Segment Reference	**SMH-3811 to SMH-3805**	Lateral Upstream Access Point	**SMH - 3811**
City	**Springfield**	Lateral Downstream Access Point	**SMH - 3805**
Street	**Armory St.**	Profile	**Horseshoe 55/48inch**
Total Length	**319.3**	Material	**Reinforced Concrete Pipe**

	Distance	PACP Code	Observation
1	0.0	AMH	Manhole
2	0.0	MWL	Water Level, 10% of the vertical dimension
3	34.9	RFJ	Roots Fine Joint from 9 o'clock to 3 o'clock, within 8 inch
4	98.6	MMC	Miscellaneous Material Change
5	98.6	DAE	Deposits Attached Encrustation, 5% of cross sectional area from 4 o'clock to 8 o'clock, within 8 inch, Start
6	105.1	MGO	Miscellaneous General Observation
7	166.3	MCU	Miscellaneous Camera Underwater
8	173.6	MWL	Water Level, 20% of the vertical dimension
9	207.5	TBA	Tap Break-in Activity at 3 o'clock, dia/height: 10inch
10	208.0	MWL	Water Level, 5% of the vertical dimension
11	228.5	RFJ	Roots Fine Joint at 11 o'clock, within 8 inch
12	301.2	DAE	Deposits Attached Encrustation, 5% of cross sectional area at 9 o'clock
13	319.2	DAE	Deposits Attached Encrustation, 5% of cross sectional area at 9 o'clock
14	319.3	DAE	Deposits Attached Encrustation, 5% of cross sectional area from 4 o'clock to 8 o'clock, within 8 inch, Finish
15	319.3	MSA	Miscellaneous Survey Abandoned

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/22/2025	**6182**	**Dry**	**Michael LoSciuto**	**0119-070304387**	**SMH-3811 to SMH-3805**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**	**10.0**	**319.3 '**	**319.3 '**

City:	**Springfield**	Drainage Area:	**City Sewer**	Upstream MH:	**SMH - 3811**
Street:	**Armory St.**	Media Label:	**SMH-3811 to SMH-3805**	Up Rim to Invert:	**10.7**
Location Code:	**Easement/Right of way**	Flow Control:	**Not Controlled**	Downstream MH:	**SMH - 3805**
Location Details:	**Armory St. & Albany St.**	Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Horseshoe**	Sewer Use:	**Combined Pipe**	Total gallons used:	**0.0**
Pipe size:	**55 x 48 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:	**Routine Assessment**	Joints failed:	**0**
Lining Method:	**None**	Owner:	**CSX**		
Additional Info:					

1:2789 Distance		Code	Observation	Counter	Photo	Grade
0.0		AMH	Manhole / SMH - 3811	00:00:00	1	
0.0		MWL	Water Level, 10% of the vertical dimension		2	
34.9		RFJ	Roots Fine Joint from 9 o'clock to 3 o'clock, within 8 inch	00:01:51	3	M1
98.6		MMC	Miscellaneous Material Change / Concrete to Brick	00:05:15	4	
98.6	S01	DAE	Deposits Attached Encrustation, 5% of cross sectional area from 4 o'clock to 8 o'clock, within 8 inch, Start	00:05:20	5	
105.1		MGO	Miscellaneous General Observation / Grade Change	00:05:33	6	
166.3		MCU	Miscellaneous Camera Underwater	00:08:40	7	M4
173.6		MWL	Water Level, 20% of the vertical dimension	00:09:04	8	
207.5		TBA	Tap Break-in Activity at 3 o'clock, dia/height: 10inch	00:10:58	9	
208.0		MWL	Water Level, 5% of the vertical dimension	00:11:36	10	
228.5		RFJ	Roots Fine Joint at 11 o'clock, within 8 inch	00:12:17	11	M1
301.2		DAE	Deposits Attached Encrustation, 5% of cross sectional area at 9 o'clock	00:17:02	12	M2
319.2		DAE	Deposits Attached Encrustation, 5% of cross sectional area at 9 o'clock	00:17:54	13	M2

Overland Engineering, LLC
100 Hallet St., Boston
Tel. 617-265-4547
bleclair@ovrleng.com

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/22/2025	**6182**	**Dry**	**Michael LoSciuto**	**0119-070304387**	**SMH-3811 to SMH-3805**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**	**10.0**	**319.3 '**	**319.3 '**

1:2789	Distance		Code	Observation	Counter	Photo	Grade
	319.3	F01	DAE	Deposits Attached Encrustation, 5% of cross sectional area from 4 o'clock to 8 o'clock, within 8 inch, Finish	00:19:00	14	M2
	319.3		MSA	Miscellaneous Survey Abandoned / End Of Inspection	00:19:00	15	

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	412H	412H	0.0	98.0	98.0	0.0	2.0	2.0

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Section Pictures - 10/22/2025 - SMH-3811 to SMH-3805

City	Street	Date	Lateral Segment Reference	Section No.
Springfield	**Armory St.**	**10/22/2025**	**SMH-3811 to SMH-3805**	**1**

1, 00:00:00, 0.00ft
Manhole / SMH - 3811

2, , 0.00ft
Water Level, 10% of the vertical dimension

3, 00:01:51, 34.90ft
Roots Fine Joint from 9 o'clock to 3 o'clock, within 8 inch

4, 00:05:15, 98.60ft
Miscellaneous Material Change / Concrete to Brick

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Section Pictures - 10/22/2025 - SMH-3811 to SMH-3805

City	Street	Date	Lateral Segment Reference	Section No.
Springfield	**Armory St.**	**10/22/2025**	**SMH-3811 to SMH-3805**	**1**

5, 00:05:20, 98.60ft
Deposits Attached Encrustation, 5% of cross sectional area from 4 o'clock to 8 o'clock, within 8 inch, Start

6, 00:05:33, 105.10ft
Miscellaneous General Observation / Grade Change

7, 00:08:40, 166.30ft
Miscellaneous Camera Underwater

8, 00:09:04, 173.60ft
Water Level, 20% of the vertical dimension

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Section Pictures - 10/22/2025 - SMH-3811 to SMH-3805

City	Street	Date	Lateral Segment Reference	Section No.
Springfield	**Armory St.**	**10/22/2025**	**SMH-3811 to SMH-3805**	**1**

9, 00:10:58, 207.50ft
Tap Break-in Activity at 3 o'clock, dia/height: 10inch

10, 00:11:36, 208.00ft
Water Level, 5% of the vertical dimension

11, 00:12:17, 228.50ft
Roots Fine Joint at 11 o'clock, within 8 inch

12, 00:17:02, 301.20ft
Deposits Attached Encrustation, 5% of cross sectional area at 9 o'clock

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Section Pictures - 10/22/2025 - SMH-3811 to SMH-3805

City	Street	Date	Lateral Segment Reference	Section No.
Springfield	**Armory St.**	**10/22/2025**	**SMH-3811 to SMH-3805**	**1**

13, 00:17:54, 319.20ft
Deposits Attached Encrustation, 5% of cross sectional area at 9 o'clock

14, 00:19:00, 319.30ft
Deposits Attached Encrustation, 5% of cross sectional area from 4 o'clock to 8 o'clock, within 8 inch, Finish

15, 00:19:00, 319.30ft
Miscellaneous Survey Abandoned / End Of Inspection

DOCUMENT B00420

PROPOSAL

SPRINGFIELD

For: **Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the City of Springfield in Hampden County, in the Commonwealth of Massachusetts, and is shown by the locus map (Document 00331) in the Proposal Pamphlet, the work locations extend as follows:

Armory Street

Beginning – Station 11+00.00 +/-
Ending –Station 19+44.00 +/-

Albany Street

Limit of Work – Station 41+30.00 +/-

Taylor Street

Limit of Work – Station 50+65.00

The contract prices shall include the furnishing of all materials (except as otherwise herein specified), the performing of all the labor requisite or proper, the providing of all necessary machinery, tools, apparatus and other means of construction, the doing of all the abovementioned work in the manner set forth, described and shown in the specifications and on the drawings for the work, and in the form of contract, and the completion thereof within **2116 CALENDAR DAYS** upon receipt of a Notice to Proceed, except that if the completion date falls between December 1 and March 15 then the same number of days beyond December 1st will be extended after March 15th.

The Work of this project is described by the following Items and quantities.

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Project # 609409	Contract # 133236			
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
100.91	1	PRECONSTRUCTION SURVEY AND MONITORING OF EXISTING STRUCTURES AT _____ LUMP SUM		
101.	0.25	CLEARING AND GRUBBING AT _____ PER ACRE		
102.1	300	TREE TRIMMING AT _____ PER FOOT		
103.	1	TREE REMOVED - DIAMETER UNDER 24 INCHES AT _____ EACH		
104.	2	TREE REMOVED - DIAMETER 24 INCHES AND OVER AT _____ EACH		
112.1	1	DEMOLITION OF BUILDING NO. 1 AT _____ LUMP SUM		
114.1	1	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. S-24-016 AT _____ LUMP SUM		
114.2	1	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. S-24-026 AT _____ LUMP SUM		
119.	1	RODENT CONTROL AT _____ LUMP SUM		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
120.1	1,300	UNCLASSIFIED EXCAVATION AT _____ PER CUBIC YARD		
127.	120	CONCRETE EXCAVATION AT _____ PER CUBIC YARD		
127.1	500	REINFORCED CONCRETE EXCAVATION AT _____ PER CUBIC YARD		
140.	2,010	BRIDGE EXCAVATION AT _____ PER CUBIC YARD		
141.1	50	TEST PIT FOR EXPLORATION AT _____ PER CUBIC YARD		
142.	178	CLASS B TRENCH EXCAVATION AT _____ PER CUBIC YARD		
144.	306	CLASS B ROCK EXCAVATION AT _____ PER CUBIC YARD		
146.	3	DRAINAGE STRUCTURE REMOVED AT _____ EACH		
149.2	1	PUBLIC OUTREACH AT _____ LUMP SUM		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
150.	60	ORDINARY BORROW AT _____ PER CUBIC YARD		
151.	760	GRAVEL BORROW AT _____ PER CUBIC YARD		
151.2	1,510	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES AT _____ PER CUBIC YARD		
156.	356	CRUSHED STONE AT _____ PER TON		
160.2	50	CONTROLLED LOW-STRENGTH MATERIAL - MECHANICAL EXCAVATABLE (101-300 PSI) AT _____ PER CUBIC YARD		
170.	2,700	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ PER SQUARE YARD		
180.01	1	ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AT _____ LUMP SUM		
180.02	120	PERSONAL PROTECTION LEVEL C UPGRADE AT _____ PER HOUR		
180.03	160	LICENSED SITE PROFESSIONAL SERVICES AT _____ PER HOUR		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
181.11	1,970	DISPOSAL OF UNREGULATED SOIL AT _____ PER TON		
181.12	2,260	DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY AT _____ PER TON		
181.13	2,260	DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY AT _____ PER TON		
181.14	70	DISPOSAL OF HAZARDOUS WASTE AT _____ PER TON		
182.1	1	INSPECTION AND TESTING FOR ASBESTOS AT _____ LUMP SUM		
182.2	800	REMOVAL OF ASBESTOS AT _____ PER FOOT		
182.3	1	ASBESTOS ABATEMENT FOR BUILDING DEMOLITION AT _____ LUMP SUM		
183.1	72,000	TREATMENT OF CONTAMINATED GROUNDWATER AT _____ PER GALLON		
183.2	13,000	DISPOSAL OF GRANULAR ACTIVATED CARBON AT _____ PER POUND		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
201.	4	CATCH BASIN AT _____ EACH		
202.	5	MANHOLE AT _____ EACH		
210.1	2	SANITARY SEWER MANHOLE MUNICIPAL STANDARD AT _____ EACH		
210.11	1	SANITARY SEWER MANHOLE MUNICIPAL STANDARD - DOGHOUSE AT _____ EACH		
212.	1	TEMPORARY SANITARY SEWER BYPASS AT _____ LUMP SUM		
220.	20	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH		
220.7	8	SANITARY STRUCTURE ADJUSTED AT _____ EACH		
220.9	1	SANITARY STRUCTURE ABANDONED AT _____ EACH		
221.	4	FRAME AND COVER AT _____ EACH		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
222.1	3	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		
223.2	3	FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED AT _____ EACH		
227.3	10	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT AT _____ PER CUBIC YARD		
227.31	300	REMOVAL OF DRAINAGE PIPE SEDIMENT AT _____ PER FOOT		
241.12	200	12 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
250.15	50	15 INCH POLYVINYLCHLORIDE SANITARY SEWER PIPE AT _____ PER FOOT		
258.	10	STONE FOR PIPE ENDS AT _____ PER SQUARE YARD		
302.122	440	12 INCH DUCTILE IRON WATER PIPE CLASS 56 AT _____ PER FOOT		
303.06	30	6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
303.08	160	8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
303.12	320	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
309.	5,000	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
325.18	410	18 INCH STEEL PIPE CASING FOR WATER PIPE AT _____ PER FOOT		
347.2	40	2 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
348.1	40	1 INCH COPPER PIPE TYPE L AT _____ PER FOOT		
348.2	40	2 INCH COPPER PIPE TYPE L AT _____ PER FOOT		
350.06	1	6 INCH GATE AND GATE BOX AT _____ EACH		
350.08	3	8 INCH GATE AND GATE BOX AT _____ EACH		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
350.12	3	12 INCH GATE AND GATE BOX AT _____ EACH		
357.12	1	12 INCH GATE BOX AT _____ EACH		
358.	22	GATE BOX ADJUSTED AT _____ EACH		
363.1	2	1 INCH CORPORATION COCK AT _____ EACH		
363.2	5	2 INCH CORPORATION COCK AT _____ EACH		
371.06	4	6 INCH COUPLING AT _____ EACH		
371.08	9	8 INCH COUPLING AT _____ EACH		
371.12	38	12 INCH COUPLING AT _____ EACH		
373.12	320	12 INCH WATER PIPE INSULATION AT _____ PER FOOT		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
373.18	440	18 INCH WATER PIPE INSULATION AT _____ PER FOOT		
379.2	2	2 INCH AIR RELEASE VALVE ASSEMBLY AT _____ EACH		
381.01	1	SERVICE BOX (MUNICIPAL STANDARD) AT _____ EACH		
381.3	3	SERVICE BOX ADJUSTED AT _____ EACH		
384.	1	CURB STOP AT _____ EACH		
402.	200	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER CUBIC YARD		
415.2	1,700	PAVEMENT FINE MILLING AT _____ PER SQUARE YARD		
431.	60	HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE AT _____ PER SQUARE YARD		
443.	11	WATER FOR ROADWAY DUST CONTROL AT _____ PER 1000 GALLONS		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
450.231	280	SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) AT _____ PER TON		
450.311	190	SUPERPAVE INTERMEDIATE COURSE - 12.5 POLYMER (SIC -12.5 - P) AT _____ PER TON		
450.42	370	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		
450.611	80	SUPERPAVE BRIDGE SURFACE COURSE - 12.5 POLYMER (SSC-B - 12.5 - P) AT _____ PER TON		
450.711	106	SUPERPAVE BRIDGE PROTECTIVE COURSE - 12.5POLYMER (SPC-B - 12.5 - P) AT _____ PER TON		
451.	80	HMA FOR PATCHING AT _____ PER TON		
452.	590	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
453.	1,720	HMA JOINT ADHESIVE AT _____ PER FOOT		
458.7	2,223	LIGHTWEIGHT AGGREGATE AT _____ PER CUBIC YARD		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
472.	60	TEMPORARY ASPHALT PATCHING AT _____ PER TON		
482.5	150	SAWCUTTING ASPHALT PAVEMENT FOR BOX WIDENING AT _____ PER FOOT		
506.1	110	GRANITE CURB TYPE VB - CURVED AT _____ PER FOOT		
509.	90	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT AT _____ PER FOOT		
509.1	30	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - CURVED AT _____ PER FOOT		
580.	190	CURB REMOVED AND RESET AT _____ PER FOOT		
582.	4	CURB CORNER REMOVED AND RESET AT _____ EACH		
590.	325	CURB REMOVED AND STACKED AT _____ PER FOOT		
594.	364	CURB REMOVED AND DISCARDED AT _____ PER FOOT		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
620.13	20	GUARDRAIL, TL-3 (SINGLE FACED) AT _____ PER FOOT		
620.33	50	GUARDRAIL - CURVED, TL-3 (SINGLE FACED) AT _____ PER FOOT		
627.2	1	GUARDRAIL ROUNDED END UNIT AT _____ EACH		
628.24	2	TRANSITION TO BRIDGE RAIL AT _____ EACH		
628.25	1	TRANSITION TO THRIE BEAM AT _____ EACH		
628.314	2	TEMPORARY IMPACT ATTENUATOR, REDIRECTIVE, TL-2 AT _____ EACH		
628.4	2	TEMPORARY IMPACT ATTENUATOR, REMOVED AND RESET AT _____ EACH		
630.2	135	HIGHWAY GUARD REMOVED AND DISCARDED AT _____ PER FOOT		
645.172	90	72 INCH CHAIN LINK FENCE (PIPE TOP RAIL) VINYL COATED (LINE POST OPTION) AT _____ PER FOOT		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
647.084	14	84 INCH CHAIN LINK FENCE (PIPE TOP RAIL) W/BARB (LINE POST OPTION) AT _____ PER FOOT		
651.096	28	96 INCH CHAIN LINK GATE WITH GATE POSTS AND BARBED WIRE AT _____ PER FOOT		
652.072	4	72 INCH CHAIN LINK FENCE END POST AT _____ EACH		
652.084	1	84 INCH CHAIN LINK FENCE END POST AT _____ EACH		
652.096	3	96 INCH CHAIN LINK FENCE END POST AT _____ EACH		
653.072	3	72 INCH CHAIN LINK FENCE CORNER OR INTERMEDIATE BRACE POST AT _____ EACH		
654.096	15	96 INCH CHAIN LINK FENCE FABRIC AT _____ PER FOOT		
657.	400	TEMPORARY FENCE AT _____ PER FOOT		
657.5	400	TEMPORARY FENCE REMOVED AND RESET AT _____ PER FOOT		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
665.	360	CHAIN LINK FENCE REMOVED AND STACKED AT _____ PER FOOT		
666.	20	CHAIN LINK FENCE REMOVED AND RESET AT _____ PER FOOT		
671.	1	FENCE GATE AND GATE POSTS REMOVED AND STACKED AT _____ EACH		
697.1	6	SILT SACK AT _____ EACH		
698.3	10	GEOTEXTILE FABRIC FOR SEPARATION AT _____ PER SQUARE YARD		
701.	190	CEMENT CONCRETE SIDEWALK AT _____ PER SQUARE YARD		
701.1	90	CEMENT CONCRETE SIDEWALK AT DRIVEWAYS AT _____ PER SQUARE YARD		
701.2	110	CEMENT CONCRETE PEDESTRIAN CURB RAMP AT _____ PER SQUARE YARD		
702.	30	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY AT _____ PER TON		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
710.3	6	BOUND - LETTERED GRANITE AT _____ EACH		
710.4	13	BOUND - PLAIN GRANITE AT _____ EACH		
722.1	1	SCHEDULE OF OPERATIONS (TYPE A) - FIXED PRICE $200,000 AT Two Hundred Thousand Dollars LUMP SUM	$200,000.00	$200,000.00
740.	73	ENGINEER'S FIELD OFFICE AND EQUIPMENT (TYPE A) AT _____ PER MONTH		
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.1	50	LOAM FOR LAWNS AT _____ PER CUBIC YARD		
751.7	80	COMPOST BLANKET AT _____ PER CUBIC YARD		
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN AT _____ LUMP SUM		
765.	400	SEEDING AT _____ PER SQUARE YARD		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
765.2	1,220	SEEDING FOR SHORT TERM EROSION CONTROL AT _____ PER SQUARE YARD		
765.21	10	ANNUAL COVER CROP FOR NATIVE SEEDING AT _____ PER POUND		
765.453	10	WOODLAND EDGE SHADE MIX AT _____ PER POUND		
765.635	820	NATIVE SEEDING AND ESTABLISHMENT AT _____ PER SQUARE YARD		
767.121	760	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
769.	90	PAVEMENT MILLING MULCH UNDER GUARD RAIL AT _____ PER FOOT		
804.2	80	2 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC (UL) AT _____ PER FOOT		
804.3	480	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) AT _____ PER FOOT		
804.4	2,520	4 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) AT _____ PER FOOT		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
804.5	370	5 INCH ELECTRICAL CONDUIT TYPE NM-PLASTIC (UL) AT _____ PER FOOT		
806.3	210	3 INCH ELECTRICAL CONDUIT TYPE RM - GALVANIZED STEEL AT _____ PER FOOT		
809.41	2,730	TEMPORARY 4 INCH ELECTRICAL CONDUIT AT _____ PER FOOT		
809.42	430	TEMPORARY CONDUIT CASING PIPE AT _____ PER FOOT		
810.2	350	4-4 INCH AND 2-5 INCH DUCT BANK AT _____ PER FOOT		
810.6	300	6-4 INCH DUCT BANK AT _____ PER FOOT		
811.31	14	PULL BOX 12 X 12 INCHES - SD2.031 AT _____ EACH		
811.35	5	PULL BOX ADJUSTED AT _____ EACH		
816.01	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 AT _____ LUMP SUM		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
816.02	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2 AT _____ LUMP SUM		
816.03	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 3 AT _____ LUMP SUM		
816.1	64	FIELD ADJUSTMENT OF EXISTING TRAFFIC SIGNAL TIMING AT _____ PER HOUR		
816.2	50	TRAFFIC MONITORING AND ENGINEERING AT _____ PER HOUR		
816.82	1	TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.2 AT _____ LUMP SUM		
816.83	1	TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.3 AT _____ LUMP SUM		
816.84	1	TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.4 AT _____ LUMP SUM		
816.85	1	TEMPORARY TRAFFIC CONTROL SIGNAL LOCATION NO.5 AT _____ LUMP SUM		
823.70	3	HIGHWAY LIGHTING POLE AND LUMINAIRE REMOVED AND RESET AT _____ EACH		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
832.	80	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
833.7	1	DELINEATION FOR GUARD RAIL TERMINI AT _____ EACH		
847.1	12	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		
850.41	1,250	ROADWAY FLAGGER AT _____ PER HOUR		
851.1	60	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	830	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
852.11	550	TEMPORARY PEDESTRIAN BARRICADE AT _____ PER FOOT		
852.12	12	TEMPORARY PEDESTRIAN CURB RAMP AT _____ EACH		
853.1	15	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
853.2	50	TEMPORARY BARRIER (TL-2) AT _____ PER FOOT		
853.21	380	TEMPORARY BARRIER REMOVED AND RESET AT _____ PER FOOT		
853.33	763	TEMPORARY BARRIER - LIMITED DEFLECTION (TL-3) AT _____ PER FOOT		
853.8	70	TEMPORARY ILLUMINATION FOR WORK ZONE AT _____ PER DAY		
854.016	3,120	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ PER FOOT		
854.036	210	TEMPORARY PAVING MARKINGS - 6 INCH (TAPE) AT _____ PER FOOT		
854.1	550	PAVEMENT MARKING REMOVAL AT _____ PER SQUARE FOOT		
856.12	4,510	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ PER DAY		
859.	8,100	REFLECTORIZED DRUM AT _____ PER DAY		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
859.1	20	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AT _____ PER DAY		
864.04	180	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) AT _____ PER SQUARE FOOT		
864.41	400	GREEN COLORIZED PAVEMENT MARKINGS AT _____ PER SQUARE FOOT		
866.106	2,140	6 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
866.112	2,110	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.106	1,700	6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.112	40	12 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
874.	2	STREET NAME SIGN AT _____ EACH		
874.41	22	TRAFFIC SIGN REMOVED AND DISCARDED AT _____ EACH		

Project # 609409 Contract # 133236				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
901.3	10	4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE FOR POST FOUNDATION AT _____ PER CUBIC YARD		
903.	10	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE AT _____ PER CUBIC YARD		
904.	1	4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE AT _____ PER CUBIC YARD		
904.3	1,179	5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE AT _____ PER CUBIC YARD		
904.33	4,581	PRECAST CONCRETE PANELS AT _____ PER SQUARE FOOT		
909.5	20	RAPID HARDENING CEMENTITIOUS PRODUCTS FOR CONCRETE REPAIRS AT _____ PER CUBIC YARD		
910.2	121,772	STEEL REINFORCEMENT FOR STRUCTURES - COATED AT _____ PER POUND		
912.4	14	DRILLED AND GROUTED #4 DOWELS AT _____ EACH		
912.5	104	DRILLED AND GROUTED #5 DOWELS AT _____ EACH		

Project # 609409 Contract # 133236				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
942.102	128	STEEL PILE HP 10 X 57 AT _____ PER FOOT		
942.283	1,474	STEEL PILE W18X283 AT _____ PER FOOT		
942.311	1,006	STEEL PILE W18X311 AT _____ PER FOOT		
942.89	1,119	STEEL PILE W16X89 AT _____ PER FOOT		
945.10	19,658	DRILLED MICROPILES AT _____ PER FOOT		
945.101	2,940	DRILLED SHAFT EXCAVATION 3.0 FOOT DIAMETER AT _____ PER FOOT		
945.301	45	OBSTRUCTION EXCAVATION 3.0 FOOT DIAMETER AT _____ PER FOOT		
945.501	2,940	DRILLED SHAFT 3.0 FOOT DIAMETER AT _____ PER FOOT		
948.60	4	MICROPILE VERIFICATION LOAD TEST AT _____ EACH		

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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
948.61	16	MICROPILE PROOF LOAD TEST AT _____ EACH		
951.1	720	GRANITE CORING AT _____ PER FOOT		
951.2	720	STEEL SLEEVE/ CONCRETE CORING AT _____ PER FOOT		
953.31	1	TEMPORARY EXCAVATION SUPPORT SYSTEM AT _____ LUMP SUM		
970.	8,153	DAMP-PROOFING AT _____ PER SQUARE FOOT		
975.4	368	PROTECTIVE SCREEN TYPE II AT _____ PER FOOT		
975.5	150	ALUMINUM HANDRAIL AT _____ PER FOOT		
992.33	1	TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 1 AT _____ LUMP SUM		
992.34	1	TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 2 AT _____ LUMP SUM		

Project # 609409 Contract # 133236				
Location : SPRINGFIELD				
Description : Bridge Replacement, S-24-016, Armory Street over CSX Mainline & S-24-026, Armory Street over Abandoned CSX				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
992.35	1	TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 3 AT _____ LUMP SUM		
992.36	1	TEMPORARY SUPPORT FOR UTILITIES - SYSTEM 4 AT _____ LUMP SUM		
994.1	6,930	TEMPORARY PROTECTIVE SHIELDING AT _____ PER SQUARE FOOT		
995.01	1	BRIDGE STRUCTURE, BRIDGE NO. S-24-016 AT _____ LUMP SUM		
995.02	1	BRIDGE STRUCTURE, BRIDGE NO. S-24-026 AT _____ LUMP SUM		
Total Qty: 334,127.25				

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