WATER INFRASTRUCTURE IMPROVEMENTS LIBERTY STREET AND WESTFORD CIRCLE SWSC CONTRACT #24-67

SPRINGFIELD WATER AND SEWER COMMISSION SPRINGFIELD, MA

BIDDING/CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

APRIL 2024

EXECUTIVE DIRECTOR

JOSHUA D. SCHIMMEL

COMMISIONERS

WILLIAM E. LEONARD VENESSA OTERO DANIEL RODRIGUEZ

DIRECTOR OF ENGINEERING AND CAPITAL PROJECTS

DARLEEN BUTTRICK, PE





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SPRINGFIELD WATER AND SEWER COMMISSION SPRINGFIELD, MA

BIDDING/CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

FOR

WATER INFRASTRUCTURE IMPROVEMENTS LIBERTY STREET AND WESTFORD CIRCLE SWSC CONTRACT #24-67

APRIL 2024



Prepared By:

Wright-Pierce 94 North Elm Street, Suite 205 Westfield, MA 01085 Phone: 413-459-2003

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ADVERTISEMENT SPRINGFIELD WATER AND SEWER COMMISSION CHIEF PROCUREMENT OFFICER Bid No. 24-67

Water Infrastructure Improvements Liberty Street and Westford Circle **CAPITAL PROJECT**

Sealed bids for a Prime Contractor contract are requested by the Springfield Water and Sewer Commission's (SWSC) Chief Procurement Officer. Bidding procedures are per Massachusetts General Laws (MGL) Chapter 30§39M as amended and other applicable statutes. This is project is funded by the Water Infrastructure Finance and Innovation Act (WIFIA), and potential bidder's attention should be drawn to the associated WIFIA requirements contained in the bidding documents.

Bids for Prime/General Contractor will be accepted by the Chief Procurement Officer at the Springfield Water and Sewer Commission John J. Lyons Administration Building, 250 M Street Ext., Agawam, MA until 2:00PM EST on May 1, 2024, at which time they will be publicly opened and read.

Water Infrastructure Improvements at Liberty Street and Westford Circle. The Work includes installation of approximately 1,000 LF of 8" DI water main in Liberty Street and 2,845 LF of 8" DI water main in Westford Circle along with services and appurtenances.

The Project is estimated not to exceed \$2,452,000.00. No Pre-bid conference will be held for this project.

Bid Forms and Contract Documents will be available for pick-up at www.biddocsonline.com on April 10, 2024, online at www.biddocsonline.com (may be viewed electronically and hard copy requested) or at Nashoba Blue, Inc. at 433 Main Street, Hudson, MA 01749 (978-568-1167). Bidders requesting Contract Documents to be mailed to them shall include a separate check for \$40.00 per set for UPS Ground (or \$65.00 per set for UPS overnight), payable to BidDocs ONLINE Inc. to cover mail handling costs (these costs are estimated and are subject to increase).

Contractor must agree to pay Davis Bacon wage rates or MA Prevailing Wage rates whenever applicable. The SWSC reserves the right to waive any informality in, or to revoke, any or all bids, if in the public interest to do so. All questions regarding bid or its specifications must be made in writing and received by the Chief Procurement Officer by April 24, 2024, 4:30 P.M. in order to be considered (contact: theo.theocles@waterandsewer.org).

Theo G. Theocles Esq., Director of Legal Affairs/Chief Procurement Officer Springfield Water and Sewer Commission

Note to Newspaper: Please publish the above only under the heading "Legal Advertisements" on the following

date: April 10, 2024. Please refer to SWSC Bid No. 24-67 when invoicing.

ESTIMATED BIDDING SCHEDULE

WATER INFRASTRUCTURE IMPROVEMENTS AT LIBERTY STREET AND WESTFORD CIRCLE

SWSC BID NO. 24-67

4/4/24	Ad Sent to the Central Register
4/10/24	Published in the Republican
4/10/24	Bid Packages are Available (www.biddocsonline.com)
4/24/24	(4:30P.M.) Written Questions Due to the CPO (theo.theocles@waterandsewer.org)
5/1/24	(2:00P.M.) GC Bids are due and opened
6/3/24	Estimated Contract Start Date
180 Calendar Days	Substantial Completion Date of Liberty Street Work (From Notice to Proceed Date)
450 Calendar	Substantial Completion of all other Work (From Notice to Proceed Date)

SWSC Bid No. 24-67
WATER INFRASTRUCTURE IMPROVEMENTS AT
LIBERTY STREET AND WESTFORD CIRCLE
Estimated Project Schedule

SECTION 00020

Water Infrastructure Improvements at **Liberty Street and Westford Circle**

Springfield Water and Sewer Commission IFB No. 24-67

INVITATION TO BID

The Springfield Water and Sewer Commission, Springfield, Massachusetts (Commission, Owner, SWSC), the Awarding Authority, invites sealed bids for the Project: "Water Infrastructure Improvements at Liberty Street and Westford Circle - SWSC Bid No. 24-67", in the City of Springfield, Massachusetts.

Sealed bids will be received at the Offices of the Springfield Water and Sewer Commission, at the John J. Lyons Administration Building at Bondi's Island, 250 M Street Extension, Agawam, MA 01101 or by mail at the John J. Lyons Administration Building at Bondi's Island, 250 M Street Extension, Agawam, MA 01101 until 2:00 p.m. on May 1, 2024 at which time all bids will be publicly opened and read aloud.

Bidders shall note that the United States Postal Service and major commercial delivery or package express companies deliver to the business office at 250 M Street Extension. It is the Bidder's responsibility to ensure that their proposal is received at the office of the Commission by the closing date and time.

The nature and general scope of work of the Contract includes the installation of approximately 3,900 linear feet of 8-inch water main replacement on Liberty Street and Westford Circle including water main connections to side streets and service connections. Work on Liberty Street is to be substantially completed in 2024 while work on Westford Circle may be completed in 2025.

The time for completion of this project is **450 calendar days** from the written Notice to Proceed. Substantial completion of Liberty Street is required within 180 calendar days from the Notice to Proceed. Substantial completion will be considered all work, identified in the Contract with the exception of permanent payement restoration.

Street opening permits will typically not be issued by the Springfield DPW between December 1st and April 1st. The Contractor is advised that liquidated damages of the minimum sum of \$1,500.00 per day shall apply if the date of substantial completion is not met. The Contractor is required to submit a proposed construction schedule with the bid.

Bidding procedures shall be in accordance with M.G.L. c. 30, § 39M, as most recently amended, and all other applicable laws.

The estimated project value is approximately: \$2,450,000

00020-1 SWSC Bid No. 24-67

21188

Plans and specifications will be available beginning on **April 10, 2024.** Contract Documents will also be available for pick-up at

www.biddocsonline.com (may be viewed electronically and hard copy requested). Bidders requesting Contract Documents to be mailed to them shall include a separate check for \$40.00 per set for UPS Ground (or \$65.00 per set for UPS overnight), payable to BidDocs Online Inc. to cover mail handling costs (these costs are estimated and are subject to increase). A deposit will not be required for each set of plans and specifications requested by interested bidders.

All questions must be made in writing and received by the SWSC Chief Procurement Officer, Theo G. Theocles, Esq., no later than **April 24, 2024**, via the following contact: theo.theocles@waterandsewer.org.

The contract documents may be examined at the Offices of the Springfield Water and Sewer Commission, 250 M Street Extension, Agawam, MA 01101.

A pre-bid conference for the Project will not be held for this project.

All bids shall be accompanied by a bid deposit in an amount no less than five percent (5%) of the value of the bid, in the form of a bid bond, certified cashier's check or treasurer's check issued by a responsible bank or trust company made payable to the Springfield Water and Sewer Commission.

A performance bond in an amount equal to 100 percent of the total amount of the bid will be required for faithful performance of the contract as well as labor and materials bond in an amount equal to 100 percent of the total bid amount. The surety company must be qualified to do business in the Commonwealth of Massachusetts, and the form of surety must be satisfactory to the Springfield Water and Sewer Commission.

Every bid bond, every performance bond and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized to do business in the Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

General Contractors shall be required to comply with all applicable Massachusetts General Laws.

Minimum Wage Rates both as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, and as required by the Davis-Bacon wage determination of the Secretary of Labor apply to this project. The greater of the two wage determinations shall govern for each class or worker. It is the responsibility of the contractor, before bid opening, to request, if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this Contract.

SWSC Bid No. 24-67 21188

This project will receive funding from the U.S. Environmental Protection Agency (EPA) Water Infrastructure Finance and Innovation Act (WIFIA) loan program. As such, federal regulations will apply to this contract including, but not limited to:

- a. Davis-Bacon Wage Requirements
- b. American Iron and Steel Requirements
- c. Disadvantaged Business Enterprise Requirements
- d. Federal Nondiscrimination Requirements
- e. Federal Interest Inclusion

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals for this project are a minimum of **4.8 percent D/MBE participation and 6.9 percent D/WBE** participation by certified DBEs. The two low bidders shall submit completed DBE forms (EEO-DEP-190C, EEO-DEP-191C and the DBE Certification of United States Citizenship form) by the close of business on the third business day after bid opening. Failure to comply with the requirements of this paragraph may be deemed to render a proposal non-responsive. No waiver of any provision of this section will be granted unless approved by the <u>Department of Environmental Protection (MassDEP)</u>. The Awarding authority requests copies of these form also be sent to its attention (theo.theocles@waterandsewer.org).

The Springfield Water and Sewer Commission reserves the right to reject any or all bids if it is in the public interest to do so. The Springfield Water and Sewer Commission reserves the right to waive any informality in if deemed it its best interest to do so as may be allowed by statute

THEO G. THEOCLES, ESQ.
DIRECTOR OF LEGAL AFFAIRS/CHIEF PROCUREMENT OFFICER
SPRINGFIELD WATER AND SEWER COMMISSION
250 M STREET EXTENSION
AGAWAM, MASSACHUSETTS 01001

END OF SECTION 00020

SWSC Bid No. 24-67 21188

SECTION 00200

REQUIRED FORMS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The checklist below is included for the bidders' convenience and in no way waive or abridge the Owner's right to reject any or all bids. Bidders are cautioned to include these required form(s):
 - 1. Sealed Bid
 - a. Bid Form (Copy provided under Bid Form Section)
 - b. Sub-Contractor List (Copy provided under Bid Form Section)
 - 2. Contractor's Bid Bond
 - a. To be provided by Contractor (5%)
 - 3. Equal Employment Opportunity Statement (SWSC form appended herein)
 - 4. Tax Certification and Affidavit (SWSC blank form appended herein)
 - 5. Corporate Certificate (SWSC blank form appended herein)
 - 6. Certificate of Non-Collusion (SWSC blank form appended herein)
 - 7. DBE Forms (EEO-DEP Forms)
 - 8. Debarment Disclosure Form (SWSC blank form appended herein)
 - 9. OSHA Safety Training Certification (SWSC blank form appended herein)
 - 10. Diesel Retrofit Program Statement of Intent to Comply
 - 11. Projected Workforce Certification
 - 12. Commonwealth of Massachusetts Worker's Compensation Law, MGL c. 152, Worker's Compensation Insurance Affidavit (if applicable).
 - 13. Statement of Bidder's Qualifications
 - a. To be provided by Contractor to demonstrate compliance with Bidder's Eligibility requirements detailed in Invitation to Bidders Section

SECTION 00200

REQUIRED FORMS

- B. In order to be determined to be a Successful Bidder, the Bidder must:
 - 1. Present clearly defined submittals as required, with completed required forms.
- C. The following forms must be submitted to the Commission before the Commission can enter into a formal Contract Agreement with the successful Bidder:
 - 1. Signed Agreement
 - 2. Contractor's Performance Bond (100%)
 - 3. Contractor's Payment Bond (100%)
 - 4. Certificate of Insurance- Naming Commission as "additional insured"

END OF SECTION

TAX CERTIFICATION AFFIDAVIT FOR CONTRACTS

Individual Social Security Number	r State Identification Number	Federal Identification Number
Pursuant to M.G.L. Ch. 62c. sec. 49a.		
Company:		
P.O. Box (if any):	Street Address Only:	
City/State/Zip Code:		
Telephone Number:	Fax Number:	
Please Identify if the bidder/proposer	is a:	
Corporation		
Individual	Name of Individual:	
Partnership	Names of all Partners:	
Limited Liability Company	Names of all Managers:	
Limited Liability Partnership	Names of Partners:	
Limited Partnership	Names of all General Partners:	
and belief, have filed all Massa paid all contributions and paym I/WE further certify that I/WE I limited to the withholding and r remittance of child support. The contractor must be in comp	tion 49A, I/WE certify under penalties of perjury that I chusetts tax returns and paid all Massachusetts taxes as ents in lieu of contributions pursuant to M.G.L., c. 151 have complied with all federal, state and local laws relateporting of any income taxes for employees and contradiance at the time it submits its bid and afterwards it Massachusetts and Local Tax Laws.	required under law, as well as A, Section 19A(b). ting to taxes, including but not actors, and the withholding and
-	Signature	
	Social Security or Federal ID No.	
	Date	

YOU \underline{MUST} FILL THIS FORM OUT COMPLETELY AND YOU \underline{MUST} FILE THIS FORM WITH YOUR BID/CONTRACT SUBMISSION. TAX AFFIDAVITS THAT ARE NOT SIGNED WILL BE REJECTED.

COLLUSION OR FRAUD STATEMENT FOR PUBLIC CONTRACTS

The undersigned certifies under penalties of perjury that this bid or proposal is in all respects bona fide, fair, and made in good faith without collusion or fraud with any other person. As used in this section the word "person" shall mean any natural person, business, joint venture, partnership, corporation, union, committee, club, any other organization, entity or legal entity, or group of individuals.

Ву:	
•	(Printed Authorized Person's Name)
By:	
,	(Authorized Person's Signature)
Its:	
	(Corporate Title)
	· ·
(Corporate Name)
`	,
Date	z.
Dan	·

DEBARMENT DISCLOSURE FORM

PUBLIC CONTRACTS - DEBARMENT CHAPTER 550, ACTS OF 1991

The said undersigned certifies under penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section 29F of Chapter 29 of the General Laws, or any other applicable debarment provisions of any other Chapter of the General Laws, or any Rule or Regulation promulgated thereunder.

Date:	:	
Name	e of Bidder:	
By:	Signature	_
	Print Name & Title of Person Signing	_
	Address	_
	City, State, ZIP	_

THIS FORM MUST BE SIGNED & RETURNED WITH YOUR BID OFFER.

EQUAL EMPLOYMENT OPPORTUNITY STATEMENT

It is the policy of the Springfield Water and Sewer Commission not to discriminate against any employee or applicant for employment because of age, race, color, religion, sex, national origin, disability, or political affiliation.

The Springfield Water and Sewer Commission shall insure that applicants are employed and that employees are treated, during employment, without discrimination based on age, race, color, religion, sex, national origin, disability, or political affiliation. Such action shall include, but not limited to, the following: employment, promotion, transfer, recruitment advertising, layoff or termination, rate of pay or other forms of compensation, medical and other benefits, and selection of training, including apprenticeships.

Unanimously Voted May 1, 1997 Springfield Water and Sewer Commission

MASSACHUSETTS STATE REVOLVING FUND AFFIRMATIVE ACTION (MBE/WBE) REQUIREMENTS

The Bidder/Proposer shall comply with Minority Business Enterprise / Women Business Enterprise (MBE / WBE) requirements of the Massachusetts State Revolving Fund agreements.

The undersigned certifies that the Bidder/Proposer has read the above Springfield Water and Sewer Commission Equal Opportunity Employment Statement and Massachusetts Affirmative Action requirements:

By:		
- y · <u> </u>	(Printed Authorized Person's Name)	
_		
By:		
<i>J</i>	(Authorized Person's Signature)	
Its:		
	(Corporate Title)	
	(Corporate Name)	
Date:		

OSHA SAFETY TRAINING CERTIFICATION

Chapter 306 of the Acts of 2004 An Act Relative to the Health and Safety on Construction Projects

GENERAL CONTRACTOR'S CERTIFICATION - BID FORM

(Name of General Bidder) hereby certifies that it, and all its subcontractors who are not filed subbidders shall:
(1) who shall certify that all employees to be employed at the worksite will hav successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.
Signed under the penalties of perjury(date)
Signature of authorized representative of contractor
Print name of authorized representative of contractor

RETURN THIS FORM WITH YOUR BID

OSHA SAFETY TRAINING CERTIFICATION

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OSHA SAFETY TRAINING CERTIFICATION

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

The bidder must provide references including telephone number and contact names in response to the questions in this section. References will be used in determining the responsibility of the bidder. The city reserves the right to use itself as a reference.

1.	Name of Bidder				
2.	Business Address				_
					_
					_
3.	The names, titles, reparties interested in the			ty numbers of all persons and as follows:	1
	Give the first and lars and directors; in the			e of corporation, give names on ames of all partners.	f
IMPO	RTANT: Be sure resid	dences and Soc	ial Security Nu	umbers are listed below.	
Name	Title	Home	e Address	Social Security #	
Bidde	's Name				

4.	The date the company was organized.					
5.	If a corporation, where incorporated.					
6.	How many years have you been engaged in the construction of sewerage , combined sewer and drainage systems under your present firm or trade name?					
7.	Please	explain the gene	ral character of wo	ork performed by y	our company.	
8.			_	currently perform the following inform	_	
Name Addre Owne Whon is Bein Done	ess of r for n Work	Whether Work Being Done as Contractor or Sub- contractor	Description of Work	Approximate Amount of Contract	Approximate Completion Date of Work	
Bidde	r's Name					

Bidder's Name

9. What is your annual gross revenue (last year and projected for the next years), what is your current revenue commitment (in dollars)?	two
	_
10. Has your present organization ever failed to complete any work awarded to it's so, state when, where, and why.	- ' If
11. Has your present organization ever defaulted on a contract? If so, state where, and why.	- nen,
12. Submit a preliminary project schedule with number of crews and construct sequencing proposed for the project.	- ion
Bidder's Name	

13.		ect(s) has/have your organizationide the following information		racter similar to this
Own Who	e and ess of er for m Work Done	State Whether Work Was Done as Contractor or Sub-Description of Work	Approximate Amount of Contract	Approximate Completion Date of Work
14.	make, mod (a) owned description	quipment available for the podel and year, size, number, al, (b) currently rented or (a) of all equipment it plans to when	and type for each such (c) to be rented. Bid	piece of equipment der must set forth
Bidde	er's Name			

	(b, c) Rented
15.	Describe the background and experience of the principal members of your organization, including the officers.
16.	Provide three (3) similar, successfully completed projects within the past five (5) years, involving the construction of sewerage, combined sewerage and storm drainage systems of a similar size and scope of the Project including large cast-in-place concrete structures. State specific information (size and complexity) including referral and contact information.
Bidde	er's Name

18.	Provide three (3) similar, successfully completed projects within the past five (5) years, involving the construction of structural cementitious rehabilitation of large sewer manholes and chambers of a similar size and scope of the Project. State specific information (size and complexity) including referral and contact information.
19.	Provide three (3) similar, successfully completed projects within the past five (5) years, involving the rehabilitation of large diameter pipe using cured-in-place pipelining of a similar size and scope of the Project. State specific information (size and complexity) including referral and contact information.
20.	Who will be the contractor's project manager? State such person's qualifications. Also list names of any other key and/or supervisory employees who will be participating in this contract and their qualifications (years of experience, etc.).
Bidd	er's Name

21.	Who will be the contractor's full time person's resume for review by Owner/Eng have a minimum of 10 years construction manage a budget, schedule, and crew contraffic management, community relaction coordination, contaminated soil management names of other key and/or supervisory employment and their qualifications (years of experiments).	ineer. The Project Superintendent must on experience; demonstrate ability to pordination; demonstrate experience in tions with local residents, utility tent, and permit compliance. Also list ployees who will be participating in this
22.	Submit the number, size and equipment of work as specified.	crews to be established to complete the
23.	Give below the name and address of one on name(s) and phone number(s), at the bank tenable them to advise regarding the finance	s), which have information that would
	Name of Bank / Contact Person	Address / Phone Number
24.	The apparent low bidder shall furnish a cany other information that may be require Commission.	
Bidde	er's Name	
Wate	r Infrastructure Improvements at	STATEMENT OF BIDDER'S
vv ale	i mirasu ucture improvements at	

Water Infrastructure Improvements at Liberty Street and Westford Circle SWSC Bid No. 24-67 QUALIFICATIONS 00200 A6-8

Bidder's Name

25.	What is your available credit? The apparent low bidder shall furnish written evidence.
26.	Employer Identification No. (Treasurer's No.)
27.	Give below the name and address of the bidder's Surety / Bonding company and the contact person's name and phone number, at the Surety / Bonding company, which has information that would enable them to advise regarding the status of existing bonds and bonding capability of your company.
	Name of Surety or Bonding Company / Contact Person Address / Phone Number
28.	Give below the name, company (or owner), address and phone number of at least five references (Owner or Engineer/Architect) who have information that would enable them to advise your performance on past or existing projects of the general nature similar to this Project.
	Name of Owner or Company / Contact Person Address / Phone Number
Bidd	er's Name

Bidder's Name

29.	Is your organization currently or has your organization been previously involved in any lawsuits regarding work performed within the last three years? If so, please provide the approximate value of dispute, and name(s) and address(s) of opposing party.					
	Name of Opposing Party / Contact Person Address / Phone Number					
30.	Name, Signature, Social Security number and Title of officer preparing this proposal.					
	Name					
	Signature					
	Social Security NumberTitle					

Bidder's Name

30.

Dated at	this		day	of		, 20
		(Sign	ature)			
Геl. No		` 2	,			
		Ву				
		Title_				
State of)			
County of)			
<u> </u>				. being	duly sy	vorn.
deposes and says that he/sl					J	
-	-0 -10					of
Name of Organization)						
and that the answers to the rue and correct.	e foregoing	question	is and a	ll stateme	ents the	rein contained a
Subscribed and sworn to be	efore me thi	s		_ day of _		, 20
			(Notar	y Public)		
Bidder's Name						
Water Infrastructure Impro				STAT	ΓEMEN	NT OF BIDDER

The undersigned hereby authorizes and requests any person, firm or corporation

My commission expires	, 20
-----------------------	------

Bidder's Name

AMERICANS WITH DISABILITIES ACT

Americans With Disabilities Act (42 U.S.C. 12131) Section 504 of the Rehabilitation Act of 1973

The Americans with Disabilities Act (the "Act") applies to all employers of fifteen or more employees. All contractors that are subject to the Act must comply with its provisions. In further compliance with the Act, all Contractors who enter into contracts with the Springfield Water and Sewer Commission are prohibited from discrimination against the Springfield Water and Sewer Commission's employees, regardless of the size of the Contractor.

The Act protects against discrimination on the basis of "disability", which is defined as a physical or mental impairment that substantially limits at least one "major life activity"; discrimination against a person having a history or record of such impairment; and discrimination against an individual regarded - even if inaccurately - as having such an impairment. The Act also expressly prohibits discrimination that is based on an individual's relationship or association with a disabled person.

The bidder shall not discriminate against any qualified employee or job applicant with a disability. A "qualified" employee or job applicant is an individual with a disability who satisfies the requisite skill, experience, education and other job-related requirements of the employment position such individual holds or desires, and who with or without reasonable accommodations, is able to perform the essential functions of the job.

By submitting its bid, the bidder certifies to the Springfield Water and Sewer Commission that it understands and will comply with all applicable provisions of the Act, including compliance with applicable provisions of Section 504 of the Rehabilitation Act of 1973, if the bidder is receiving federal funds.

END OF SECTION

AMERICANS WITH

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AMERICANS WITH

CORPORATE CERTIFICATION

I	a resident of		in	the
** (Clerk/Secretary)		(City	v/Town)	
State of	DO HEREBY CERTII	Y that I am	the Clerk/Secretary	of
(State)				•
(Bidder/Proposer)	a Corporation of	luly organize	ed and existing und	er and
		1 /1 / T	1 . 1 . 0.1	
by virtue of the laws of the State of	(State)	and that I	nave custody of the	ie
records of such Corporation; and that as o	of the date herein below reci			
* (Printed Authorized Person's Name)		(Corporate Office)		
authorized to execute and deliver in	the name and on behalf	of the Co	orporation the fol	lowing
IN WITNESS WHEREOF, I have h	nereunto set my hand and	affixed the	Corporate Seal	of such
Corporation the day of	,			
(Affix Seal Here)				
	By:			
		** (Clerk / Secre	tary)	

- * This must be the name of the person authorized in the Firm's by-laws to sign contracts.
- ** Since an Officer of the Firm cannot certify himself / herself this document must be signed someone other than the person signing the Contract Agreement.

GENERAL CONTRACTOR'S CERTIFICATION

	(Contractor Name)									
Certifies the	hat they:									
1.	. Will not discriminate in their employment practices;									
2.	Intend to use the following listed construction trades in the work under the contract									
	and									
3.	Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and									
4.	Are in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and									
5.	Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.									
6.	Agree to comply with all provisions contained herein.									
	Signature of authorized representative of Contractor Date									
	Printed name of authorized representative of Contractor									

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PROJECTED WORKFORCE CERTIFICATION

THIS FORM MUST BE SUBMITTED WITH YOUR BID

I,						
Certify that the following is my projected w	vorkforce for this contract:					
"Locust Main Interceptor Rehabilitation and Optimization Improvements Project", Springfield, MA						
GENERAL CONTRACTOR	ESTIMATED # OF NEW HIRES					
SUBTRADE	ESTIMATED # OF NEW HIRES					
Signed under penalties of perjury,						
Bidder's Name						

Water Infrastructure Improvements at Liberty Street and Westford Circle SWSC Bid No. 24-67

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SPRINGFIELD WATER AND SEWER COMMISSION SPRINGFIELD, MASSACHUSETTS

Water Infrastructure Improvements at Liberty Street and Westford Circle

CONTRACT NO. CA-24-67

SECTION 00300

FORMS FOR GENERAL BID

	PLACE:
	DATE:
Proposal of(Name of Proposer)	(hereinafter called "BIDDER")*
A corporation organized and existing under the law	rs of the State of,*
a partnership, or an individual doing business as	.*
*Insert corporation, partnership, or individu	al as applicable.
To the SPRINGFIELD WATER AND SEWER CO	OMMISSION, hereinafter called the "Owner."

Re: "Water Infrastructure Improvements at Liberty Street and Westford Circle"
Contract Number: CA-24-67

Gentlemen:

The BIDDER, in compliance with your Invitation to Bid for the "Water Infrastructure Improvements at Liberty Street and Westford Circle – Contract No. CA-24-67", Springfield, Massachusetts, having examined the Plans and Specifications with related documents and the site of the proposed Project and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies and to construct the project in accordance with the Contract Documents within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents of which this Proposal is a part.

BIDDER hereby agrees to commence work under this Contract, on or before a date to be specified in a written "Notice To Proceed", by the Owner, and to fully complete the project within **450 calendar days** and **180** calendar days for Substantial Completion of Liberty Street from the written Notice to Proceed. Substantial completion will be considered all work

identified in the Contract with the exception of permanent pavement restoration. Time is of the essence and the Contractor must provide multiple construction crews if necessary to meet the project deadlines identified herein. Street opening permits will typically not be issued by the Springfield DPW between December 1st and April 1st. **The Contractor is advised that liquidated damages of the minimum sum of \$1,500.00 per day shall apply if the date of substantial completion is not met and/or if the date of final completion is not met.** No work on Saturdays, Sundays or holidays will be allowed. Night work will only be allowed as required in these Contract Documents or with prior City of Springfield and Owner approval. BIDDER further agrees to pay as liquidated damages the minimum sum of \$1,500.00 for each consecutive calendar day thereafter until the Project is Substantially Complete and/or the minimum sum of sum of \$1,500.00 for each consecutive calendar day thereafter until the Project is fully completed.

A Labor and Material Payment Bond in the amount of 100% of the total Contract Price must be provided by the General Contractor.

A Performance Bond in the amount of 100% of the total Contract Price must be provided by the General Contractor.

Bidder acknowledges receipt of the following addenda:

SCHEDULE OF PRICES follows this page [10 pages numbered 003300-2.1 through 003300-2.10, inclusive]

Bidder shall include bid amounts for ALL bid items. Unit and lump sum prices and extended amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern. The unit and lump sum prices bid shall include all labor, equipment, materials, overhead, profit, insurance, and other costs as described in detail in SECTION 01025 – MEASUREMENT AND PAYMENT.

Bidder will con	uplete the Project Work in accordance with th	e Contract Documents for the
Proposed Contract Pr	ice	
of		Dollars and
	(Use Words)	
	Cents (\$),
		Figures)

which represents the sum of work items 1 through 46 in the Schedule of Prices as follows:

NOTE: The award will be based upon the Proposed Contract Price and will be made in accordance with the provisions of MGL Chapter 30, Section 39M. The quantities designated throughout the Bid Schedule, however, are estimates only, and the Unit Price provided for a category of Work shall be the basis for the entire term of the Contract, for additions to or deletions from the Total Contract Price for Work of the category, so long as the number of units of work remains within fifteen percent (15%) of the estimated quantity.

This project is being bid under Chapter 30, Section 39M of the Massachusetts General Laws. The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding. The Bidder understands that the Owner shall determine if this bid is responsible and eligible in accordance with MGL Chapter 30, Section 39M based in part on information contained in the Statement of Bidder's Qualifications submitted as part of this bid form.

The undersigned hereby declares that he has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this FORMS FOR GENERAL BID, and he has carefully read and examined the Drawings, the annexed proposed CONTRACT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof.

The undersigned hereby declares that he understands that information relative to subsurface and other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents and he agrees that he shall not use or be entitled to use any such information made available to him through the Contract Documents or otherwise or obtained by him in his own examination of the site, as a basis of or ground for, any claim against the Owner or the Engineer arising from or by reason of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered during the construction work, and he has made due allowance therefore in this Bid.

The undersigned hereby declares that he understands that the quantities of work tabulated in this Bid or indicated on the Drawings or in the Specifications or other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Engineer.

The undersigned agrees that, if this Bid is accepted he will contract with the Owner, as provided in the copy of the Contract Documents deposited in the office of the Engineer, this FORMS FOR GENERAL BID form being part of said Contract Documents, and that he will perform all the work and furnish all the materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other things required by the Contract Documents in the manner and within the time therein prescribed and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefore the lump sum or unit price applicable to each item of the Work as stated in the schedule below.

The undersigned certifies under penalties of perjury that no officer, agent, or employee of the Owner is directly or indirectly interested in this BID.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work.

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Code of Federal Regulations and State Laws and Regulations exist, the more stringent requirement shall apply.

As required by M.G.L.c.62C, s49A, the undersigned certifies under the penalties of perjury that the Bidder, to the best of the Bidder's knowledge has filed all state tax returns and paid all State Taxes Required under law.

The undersigned certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of Section Twenty-Nine F of Chapter Twenty-Nine, or any other applicable debarment provisions of any other Chapter of the General Laws or any rule or regulation promulgated thereunder.

Respectfully submitted,
Date :
Name of General Bidder:
Federal Employer Identification Number:
By (signature):
Name and Title of Person Signing the Bid:
Business Address:
City, State, and Zip Code:

CERTIFICATE OF AUTHORITY

At a duly authorized meeting o	of the Board of Directors of the _	
		(name of corporation)
held on(date)	_, Directors were present or wair	ved notice, it was voted that
	of this company be ar	nd hereby is authorized to execute
(name and title)		•
contracts and bonds in the nam	e and behalf of said company, a	nd affix its Corporate Seal thereto,
and such execution of any cont	ract or bond of obligation in this	s company's name on its behalf of
suchunde	er seal of the company shall be v	alid and binding upon this company.
A TRUE COPY,		
ATTEST:		
	Place of Business:	
I hereby certify that I am the	of the	
	of the	(Name of Corporation)
that	is the duly elected	of said
(Name of Officer)	·	(Title)
company, and the above vote h	as not been amended or rescinde	ed and remains in full force and
effect as of the date of this conf	tract.	
	Signature:	
(Corporate Seal)	Name/Title:	
	Date:	

COMMONWEALTH OF MASSACHUSETT	S, SS, 20
Then personally appeared the above named	and acknowledged the
foregoing instrument to be his/her free act and	deed before me.
	Notary Public
	My commission expires:

LIST OF PROPOSED SUBCONTRACTORS

Bidder shall state the names and addresses of all subcontractors that he/she proposes to use on this project and a description of the work to be done by each.

If none, write "none"
*Description of Work
Proposed Subcontractor Name
Address
*Description of Work
Proposed Subcontractor Name
Address
*Description of Work
Proposed Subcontractor Name
Address
*Description of Work
Proposed Subcontractor Name
Address
*Insert description of work and subcontractors' names as may be required.
This is to certify that the names of the above mentioned subcontractors are submitted with fu knowledge and consent of the respective parties. The Bidder warrants that none of the propose subcontractors have any conflict of interest as respects this Contract.
Bidder(Name)
By(Signature and Title)
(Digitative and Title)

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
1	N/A	1	LS	Mobilization/Demobilization (Shall not exceed 5% of Subtotal of all other Items) Dollars (\$) Per Unit	
2	01570	1	LS	Traffic Control Dollars (\$) Per Unit	
3	01570	1	ALLOW	Uniformed Police for Traffic Control One Hundred and Seventy Five Thousand and 0/100 Dollars (\$175,000) Per Unit	\$175,000
4	02200	120	CY	Trench Excavation (Ledge) Oblians Dollars	
5	02200	200	CY	Replacement of unsuitable material above pipe bedding Dollars (\$) Per Unit	
6	02200	110	CY	Excavation Below Grade and Backfil Dollars (\$) Per Unit	
				SUBTOTAL	

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
7	02200	13	EA	Test Pits Excavation and Backfill Doll (\$) Per Unit	ars
8	02620	23	EA	Cut, Cap and Abandonment of Existing Water Main not in same Trench Doll (\$) Per Unit	ars
9	02620	2	EA	Water Main - Temporary Cap and Replacement Doll (\$) Per Unit	ars
10	02620	40	LF	4" Ductile Iron Water Main Doll (\$) Per Unit	ars
11	02620	80	LF	6" Ductile Iron Water Main Doll (\$) Per Unit	ars
12	02620	3,845	LF	8" Ductile Iron Water Main Doll (\$) Per Unit	ars
				SUBTO	ГAL

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
13	02620	20	LF	10-inch Ductile Iron Water Main Dollars (\$) Per Unit	
14	02620	30	LF	16-inch Ductile Iron Water Main Dollars (\$) Per Unit	
15	02665	755	LF	1 - Inch Copper Service Dollars (\$) Per Unit	
16	02665	7	EA	6 - Inch Gate Valve Dollars (\$) Per Unit	
17	02665	36	EA	8 - Inch Gate Valve Dollars (\$) Per Unit	
18	02665	1	EA	6"x 6" Tapping Sleeve and Valve Dollars (\$) Per Unit	
				SUBTOTAL	

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
19	02665	1	EA	10" x 8" Tapping Sleeve and Valve Dollars (\$) Per Unit	
20	02665	1	EA	16" x 8" Tapping Sleeve and Valve Dollars (\$) Per Unit	
21	02665	25	EA	Abandon Gate Valve/Curb Stop Dollars (\$) Per Unit	
22	02665	57	EA	1 - Inch Corporation Stop Dollars (\$) Per Unit	
23	02665	1	EA	2 - Inch Corporation Stop Dollars (\$) Per Unit	
24	02665	36	EA	1 - Inch Curb Stop Dollars (\$) Per Unit	
				SUBTOTAL	

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
25	02665	16	EA	1 - Inch Air Corporation Dollars (\$) Per Unit	
26	02665	16	EA	2 - Inch Air Corporation Dollars (\$) Per Unit	
27	02665	3	EA	2 - Inch Air Valve Assembly Dollars (\$) Per Unit	
28	02665	7	EA	Hydrant Assemblies Dollars (\$) Per Unit	
29	02665	1	EA	Catch Basin Dollars (\$) Per Unit	
30	02665	110	LF	Pipe Insulation Dollars (\$) Per Unit	
				SUBTOTA	AL .

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
31	02525	330	LF	Existing Curbs, Steps, and Walls Remove and Reset Dollar (\$) Per Unit	S
32	02513	17	EA	Preformed Pavement Marking Symbols Dollar (\$) Per Unit	s
33	02513	500	LF	4" White and Yellow Thermoplastic Reflectorized Pavement Markings Dollar (\$) Per Unit	s
34	02513	150	SY	Grind Existing Pavement Liberty/Dwight Street 2-inches Dollar (\$) Per Unit	s
35	02513	20	TONS	Permanent Pavement Liberty/Drwight Street 2-inches Dollar (\$) Per Unit	s
36	02513	1,060	TONS	Temporary (Initial) Pavement (Trench) Dollar (\$) Per Unit	s
				SUBTOT	AL

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
37	02513	410	TONS	Permanent Pavement (Trench) Dolla (\$) Per Unit	urs
38	02510	50	SY	Concrete Sidewalks and Driveways Dolla (\$) Per Unit	urs
39	02225	255	CY	Flowable Fill Obligation (\$) Per Unit	urs
40	02513	1	LS	Repair/Replace Traffic Signal Loop Detector Dollar (\$) Per Unit	urs
41	02665	3,000	LBS	Additional Pipe Fittings Dolla (\$) Per Unit	nrs
42	02753	1,161	LF	CCTV and Cleaning of Sewer Pipes Dolla (\$) Per Unit	urs
				SUBTO	ΓAL

SCHEDULE OF PRICES

Item #	Spec. Section Ref.	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
43	02753	20	EA	CCTV of Sewer Laterals to Property Line Dollars (\$) Per Unit	
44	N/A	1	ALLOW	Utility Service Allowance and Fire Service Testing Ten Thousand and 0/100 (\$10,000) Per Unit	\$10,000
45	N/A	1	ALLOW	Price Adjustment Twenty Thousand and 0/100 Dollars (\$ 20,000) Per Unit	\$20,000
46	N/A	1	ALLOW	Allowance for Unforeseen Conditions Ninety Seven Thousand and 00/100 (\$97,000) Per Unit	\$97,000
				SUBTOTAL	

For each item, write in the lump sum or unit prices bid in both words **and** figures in the spaces provided. The Bidder is requested to fill in the calculated "Amount" for each item. In case of a discrepancy between the Unit Prices Bid written in words and the Unit Prices Bid written in figures, the unit Prices Bid written in words shall govern. In case of an error in calculating any Amount, the Amount will be corrected based upon the actual value of the quantity times the Unit Price Bid, written in words.

SCHEDULE OF PRICES

SI	UBTOTAL PAGE 00300-2.1	
SI	UBTOTAL PAGE 00300-2.2	
SI	UBTOTAL PAGE 00300-2.3	
Si	UBTOTAL PAGE 00300-2.4	
Si	UBTOTAL PAGE 00300-2.5	
S	UBTOTAL PAGE 00300-2.6	
S	UBTOTAL PAGE 00300-2.7	
S	SUBTOTAL PAGE 00300-2.8	

	(In Words)	(In Figures)
TOTAL AMOUNT BID	GRAND TOTAL	\$

Important: The time for completion of this project is 450 calendar days from the written Notice to Proceed. Substantial completion of Liberty Street is required within 180 calendar days from the Notice to Proceed. Street opening permits will typically not be issued by the Springfield DPW between December 1st and April 1st. The Contractor is advised that liquidated damages of the minimum sum of \$1,500.00 per day shall apply if the date of substantial completion is not met and/or the date of full project completion is not met. The Contractor is required to submit a proposed construction schedule with the Bid.

SPRINGFIELD WATER AND SEWER COMMISSION

SPRINGFIELD, MASSACHUSETTS

Water Infrastructure Improvements Liberty Street and Westford Circle Contract No. 2024XXXX

AGREEMENT

THIS AGREEMENT is dated as of the	day of	in the year	by
and between Springfield Water and Sewer	Commission a	cting by and through its l	Board of
Water Commissioners (hereinafter called C	COMMISSION	I, SWSC or OWNER), di	uly
authorized therefor, acting herein solely fo	r said Commis	sion and without persona	ıl liability
to the City/Town, and	(he	ereinafter called	
CONTRACTOR). COMMISSION AND O	CONTRACTO	R, in consideration of the	mutual
covenants hereinafter set forth, agree as fol	llows:		

ARTICLE 1. WORK

1.1 CONTRACTOR shall perform the Work as specified or indicated in these Contract Documents. The scope of work is summarized in Section "Summary of Work" and described herein these specifications.

ARTICLE 2. OWNER AND ENGINEER

2.1 The Project has been designed by that Wright-Pierce, who is hereinafter called ENGINEER and who is to act as COMMISSION'S representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIMES

- 3.1 The Work will be substantially completed within 180 days from the date of the Notice to Proceed and completed and ready for final payment in accordance with the General Conditions no later than December 20, 2024.
- 3.2 Project Schedule: Contractor shall submit a work schedule within 7 calendar days of receipt of signed Agreement.
- 3.3 CONTRACTOR agrees that the Work shall be prosecuted diligently and uninterruptedly and at such rate of progress as will ensure full completion thereof within the Contract Time stated above. It is expressly understood and agreed, by and between CONTRACTOR and OWNER, that the Contract Time is reasonable for the completion of the Work.

- 3.4 Work hours shall be defined as follows:
 - 3.4.1 Normal work hours: Monday-Friday, 7:00 a.m. to 3:30 p.m.
 - 3.4.2 Extended work hours: Monday-Friday, 7:00 a.m. to 5:00 p.m.
 - 3.4.3 No work on Saturdays unless authorized by SWSC in writing.
 - 3.4.4 No work is allowed on Sundays or Commission observed holidays.

ARTICLE 4. CONTRACT PRICE

4.1 COMMISSION shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the prices stipulated in the CONTRACTOR's BID Form attached to this Agreement.

ARTICLE 5. APPLICATION FOR PAYMENT

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be reviewed and certified by ENGINEER as provided in the General Conditions.

- 5.1 CONTRACTOR shall prepare a Schedule of Values (SOV) and submit for ENGINEER and OWNER's review and approval. The SOV shall be broken down into sufficient work tasks that detail the sequence of work. Applications for Payments shall be based on the Approved SOV.
- 5.2 CONTRACTOR shall submit Applications for Payment in accordance with the approved SOV. Applications for Payment will be reviewed by the Engineer and processed by OWNER as provided in the Conditions of the Contract.
- 5.3 Retainage shall be held in the amount of 5% until satisfactory substantial completion of the Work. Upon substantial completion the OWNER shall pay the CONTRACTOR the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the CONTRACTOR and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of M.G.L. Chapter 30, Section 39F, or based on the record of payments by the CONTRACTOR to the subcontractors under this Contract if such record of payment indicates that the CONTRACTOR has not paid

subcontractors as provided in Section 39F.

ARTICLE 6. PROGRESS AND FINAL PAYMENTS

- OWNER will make payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment. All payments will be on the basis of the progress of the Work measured by the approved SOV and certified by the ENGINEER. No payment can be reviewed or approved without an agreeable SOV.
- 6.2 OWNER will make progress and final payments after review and acceptance of the received applications for payment, in accordance with the applicable Massachusetts General Law.
- 6.3 Progress payments will be made for the approved amounts less 5% retainage.

ARTICLE 7. LIQUIDATED DAMAGES

Owner will suffer financial and other losses if the Work is not completed within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner One thousand Five Hundred Dollars and 00/100 \$1,500.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 3.1 above for Substantial Completion until the Work is substantially complete.

ARTICLE 8. ASSURANCE

- 8.1 CONTRACTOR has familiarized himself/herself with the nature and extent of the Contract Documents, Work, locality, and with all local conditions and Federal, State and local laws, ordinances, rules and regulations that in any manner may affect cost, progress or performance of the Work.
- 8.2 CONTRACTOR has studied carefully all and the physical conditions at the site or otherwise affecting cost, progress or performance of the Work which were relied upon by OWNER in the preparation of the Drawings and Specifications and which have been identified in Article 4 of the Supplementary Conditions.

- 8.3 CONTRACTOR has made or caused to be made examinations, investigations and tests and studies of such reports and related data in addition to those referred to in the above paragraph as CONTRACTOR deems necessary for the performance of the Work at the Contract Price within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are or will be required for such purposes.
- 8.4 CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.
- 8.5 CONTRACTOR has given OWNER written notice of any conflict, error or discrepancy that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by OWNER is acceptable to CONTRACTOR.
- 8.6 CONTRACTOR agrees that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

ARTICLE 9. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between COMMISSION and CONTRACTOR concerning the Work consist of the following:

- 9.1 Invitation to Bid.
- 9.2 Instructions to Bidders.
- 9.3 CONTRACTOR's Bid Submission.
- 9.4 This Agreement.
- 9.5 Performance Bond, EJCDC Document C-610, 2002 edition, Performance Bond; EJCDC Document C610, 2002.
- 9.6 Payment Bond, EJCDC Document C-615, 2002 edition, Payment Bond; EJCDC Document C615, 2002.
- 9.7 Standard General Conditions of the Construction Contract, EJCDC Document C-700, 2002 edition.
- 9.8 Certificate(s) of Insurance.

- 9.9 Supplementary Conditions.
- 9.9 Technical Specifications (Included in these Contract Documents).
- 9.10 Contract Documents.
- 9.11 Addenda numbers _____ to ____, inclusive.
- 9.12 WIFIA Documentation, Requirements, and Associated Forms.
- 9.13 Drawings prepared by Wright-Pierce.
- 9.14 All employment requirements specified in these documents.
- 9.15. Davis Bacon and Massachusetts Wage Rates.
- 9.16 Any modification, including Change Orders, duly delivered after execution of Agreement.

ARTICLE 10. MISCELLANEOUS

- 10.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 10.2 Neither OWNER nor CONTRACTOR shall, without the prior written consent of the other, assign or sublet in whole or in part any interest under any of the Contract Documents; and, specifically but without limitation, CONTRACTOR shall not assign any monies due or to become due without the prior written consent of OWNER. In case CONTRACTOR assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to CONTRACTOR shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract.
- 10.3 COMMISSION and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to all covenants, agreements, and obligations contained in the Contract Documents.
- 10.4 The Contract Documents constitute the entire agreement between OWNER and CONTRACTOR and may only be altered, amended or repealed by a Modification.
- 10.5 The Contractor warrants that any products developed hereunder do not infringe upon or violate any patent, copyright, trade secret, or any other propriety right of

any third party. In the event of any claim alleging the aforementioned against the Owner, the Owner shall promptly notify Contractor and the Contractor shall defend such claim, in the Owner's name but at Contractor's expense, and shall indemnify the Owner against any loss, cost, expense or liability arising out of such claim, whether or not such claim is successful.

- 10.6 The Contractor, its employees and its subcontractors shall keep confidential all propriety information and material to which its employees, or its subcontractors may be exposed in the course of work hereunder, including, but not limited to, proprietary information of third parties.
- 10.7 The Contractor shall defend, indemnify and hold the Owner harmless from and against any loss, cost, liability or expense (including reasonable counsel fees) arising out of any breach or claimed breach of this provision.
- 10.8 Contractor agrees that all reports, studies, analysis, specifications, recommendations and all other materials of whatsoever nature, prepared by Contractor for use under this project, or furnished the Contractor by the Owner for use under this project, are to be considered confidential, and that Contractor will neither publish, circulate, nor use any of the foregoing, without first obtaining the written approval of the Owner.
- 10.9 The Contractor agrees that it will not issue any news releases to the public press or any publications wholly or partly related to its Work under this Agreement without first obtaining the prior written consent of the Owner. The Contractor further agrees that it will not make speeches, engage in public appearances, publish articles or otherwise publicize its Work under this Agreement without prior written approval of the Owner.
- 10.10 No action shall lie or be maintained against the Owner on any claim based upon this Agreement, or arising out of this Agreement, or out of anything in connection with this Agreement unless such action shall be commenced within four (4) months from completion of the Work hereunder or the earlier termination of this Agreement. Any justifiable dispute arising hereunder shall be brought in a state court located in Hampden County, in the City of Springfield, Massachusetts or federal court of competent jurisdiction located in the City of Springfield. The parties agree that this Contract shall be construed under, and enforced in accordance with the laws of the Commonwealth of Massachusetts, without regard of conflict of law principles.
- 10.11 The Contractor represents that it, its employees, and its subcontractors possess the professional and technical expertise necessary to perform the Work hereunder.

- 10.12 The Contractor shall be liable to and hereby agrees to indemnify, defend and hold harmless the Owner and each member, officer, agent, and employee of the Owner against all claims against any of them for bodily injury or wrongful death or property damage including that which may be sustained by him or caused by any error, omission, negligent act or intentional act of the Contractor or any one employed by the Contractor in the execution or performance of this Agreement.
- 10.13 All Work to be performed under this Agreement shall be performed with the Contractor's own employees, except that the Contractor may be permitted, as provided herein, to subcontract any area of services to be performed.
 - 10.13.1 None of the services performed hereunder may be subcontracted nor may this Agreement or the rights or obligations hereunder be assigned without the prior written consent of the Owner, such consent shall not be unreasonably withheld.
- 10.14 No member of the Commission or any officer or employee of the Owner shall be liable personally under or by reason of this Agreement or any of its provisions.
- 10.15 In the event that any claim is made, action is brought, proceeding is instituted, or hearing is called which is in any way related to the subject matter of this Agreement or to the Work Products produced or findings, methods or conclusions made or utilized by the Contractor as a result thereof, the Contractor shall diligently render to the Owner any and all assistance, including testimony, which the Owner may require of the Contractor. The parties understand and acknowledge that any fee paid hereunder to the Contractor does not include such assistance or testimony, and that in the event that Contractor is required to perform such services it will be reasonable compensated, therefore.
- 10.16 The Contractor covenants that neither it nor any officer of the corporation nor any partner of the partnership, as the case may be, has any interest nor shall it acquire any interest, directly or indirectly, which would conflict in any manner or degree with the performance of the Work hereunder. The Contractor further covenants that, in the performance of this Agreement, no person having such interest shall be employed by it. It is expressly understood that breach of any of the covenants contained herein is a material breach of this Agreement and shall entitle the Owner to recover immediate damages.
- 10.17 The relationship of the Contractor to the Owner is that of an independent contractor. In accordance with its status as such, the Contractor covenants that it,

its employees, and its subcontractors will conduct themselves consistent with such status; will neither hold themselves out as nor claim to be an officer or employee of the Owner by reason hereof; and will not, by reason hereof, make any claim, demand or application to or for any right or privilege applicable to an officer of employee of the Owner, including, but not limited to, Worker's Compensation coverage, unemployment insurance benefits, Social Security coverage, or retirement membership or credit.

- 10.18 The Contractor hereby represents that to the best of its knowledge neither it nor any of its personnel has been the subject of any investigation, nor have any of them been convicted or indicted for commission of any crime involving misconduct, corruption, bribery, or fraud in connection with any public contract in the Commonwealth of Massachusetts or any other jurisdiction, except as has been specifically disclosed in writing to the Owner, and that should any such conviction or indictment be obtained or any such investigation commenced prior to the expirations of the term hereof, regardless of the date of the occurrence giving rise to the subject matter of such conviction, indictment or investigation, it will be disclosed in writing to the Owner. Breach of this provision is expressly understood to constitute a material breach of this Agreement.
- 10.19 The fair share goals for disadvantaged business enterprise (DBE) participation for this contract are a minimum of 4.8 percent Disadvantaged Minority Business Enterprise (D/MBE) participation and 6.9 percent Disadvantaged Women Business Enterprise (D/WBE) participation, applicable to the total dollar amount paid for the construction contract. The Contractor shall take all affirmative steps necessary to achieve this goal, and shall provide reports documenting the portion of contract and subcontract dollars paid to DBEs, and its efforts to achieve the goals, with each invoice submitted or at such greater intervals as specified by the Owner. The contractor shall require similar reports from its subcontractors.
- 10.20 During the performance of this contract, the contractor agrees as follows:
 - The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: 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. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting

- officer setting forth the provisions of this nondiscrimination clause.
- The contractor will, in all solicitations or advancements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders. Comp., p. 684, EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230.
- 10.21 In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- 10.22 The contractor will include the provisions of paragraphs (a) through (f) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or

purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States. [Sec. 202 amended by EO 11375 of Oct. 13, 1967, 32 FR 14303, 3 CFR, 1966-1970].

10.23 The Contractor agrees that it will fully comply with Subpart C of 2 CFR Part 180 and 2 CFR Part 1532, entitled Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons). The Contractor shall not award any subcontracts or purchase any materials from suppliers that appear on the Excluded Parties List System. The Contractor shall include this requirement in each subcontract and require it to be included in all subcontracts regardless of tier. The Contractor shall maintain reasonable records to demonstrate compliance with these requirements.

IN WITNESS WHEREOF, the SPRINGFIELD WATER AND SEWER COMMISSION,
acting by and through the Board of Water Commissioners, with the approval of the Executive
Director, and, CONTRACTOR have executed this
Agreement. All portions of the Contract Documents have been signed, initialed, or identified
by COMMISSION and CONTRACTOR or identified by ENGINEER on their behalf.
This Agreement will be effective on, 2024 (which is the Effective Date of the
Agreement as a sealed instrument on the day and year the same is signed by all parties hereto, on the
date noted).
THE CONTRACTOR.
THE CONTRACTOR:
:
Sign:
Print:
Title:
Date Signed:

SPRINGFIELD WATER AND SEWER COMMISSION	DN:
Approved:	
JOSHUA D. SCHIMMEL, EXECUTIVE DIRECTOR	DATE
Reviewed:	
DIRECTOR OF LEGAL AFFAIRS/CPO	DATE
Approved as to Appropriation:	
COMPTROLLER	DATE

INGFIELD WATER AND SEWER COMMISSION:	
DANIEL RODRIGUEZ, COMMISSIONER	DATE
WILLIAM E. LEONARD, COMMISSIONER	DATE
VANESSA OTERO, COMMISSIONER	DATE
APPROVED AS TO FORM:	
COMMISSION COUNSEL	DATE

ADDRESS FOR GIVING NOTICES:

SPRINGFIELD WATER AND SEWER COMMISSION 250 M STREET EXTENSION AGAWAM, MA 01001

Note: If CONTRACTOR is a corporation, an affidavit giving the principal the right to sign the Agreement must accompany the executed Agreement.

END OF SECTION

PERFORMANCE BOND

CONTRA	ACTOR (Name and Address):	SURETY (Name, and Address of Principal Place of Business			
OWNER	(Name and Address):				
Amo	ctive Date of Agreement:				
Date Agre Amo Mod	ifications to this Bond Form:		y, subject to the terms set forth below, do eac d officer, agent, or representative.	ch cause	
CONTRA	ACTOR AS PRINCIPAL		RETY		
Contrac	tor's Name and Corporate Seal	(Seal)S	Surety's Name and Corporate Seal	(Sea	
By:	Signature	By	: Signature (Attach Power of Attorney)		
	Print Name		Print Name		
	Title		Title		
Attest:	Signature	Att	Signature		
	Title		Title		
Note: Pro	ovide execution by additional partie	s, such as join	t venturers, if necessary.		

Page 1 of 3

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

- 1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
- 2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
 - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
 - 1. Surety in accordance with the terms of the Contract; or
 - 2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
- 3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
 - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 - 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
- 4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
- 5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.
- 6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.
- 7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.
- 8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
- 9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.
- 10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other party*):

PAYMENT BOND

CONT	RACTOR (Name and Address):	SURE Busine	TY (Name, and Address of Principal Place of ess):
OWNE	R (Name and Address):		
Ar	RACT fective Date of Agreement: mount: escription (Name and Location):		
Da Ag Ar M	ond Number: ate (Not earlier than Effective Date of greement): mount: odifications to this Bond Form:	aund hereby	
			subject to the terms set forth below, do each ed officer, agent, or representative.
cause tl	nis Payment Bond to be duly executed by RACTOR AS PRINCIPAL		ed officer, agent, or representative.
cause tl	nis Payment Bond to be duly executed by	an authorize	ed officer, agent, or representative.
cause the	nis Payment Bond to be duly executed by RACTOR AS PRINCIPAL	an authorize SURE	ed officer, agent, or representative.
CONT Contr	nis Payment Bond to be duly executed by RACTOR AS PRINCIPAL (Seal)	an authorize SURE	ed officer, agent, or representative. ETY (See
CONT Contr	RACTOR AS PRINCIPAL (Seal) ractor's Name and Corporate Seal	an authorize SURE Sure	ed officer, agent, or representative. ETY (Seety's Name and Corporate Seal
CONT Contr	RACTOR AS PRINCIPAL (Seal) ractor's Name and Corporate Seal Signature	an authorize SURE Sure	ed officer, agent, or representative. ETY (See ty's Name and Corporate Seal Signature (Attach Power of Attorney)
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CONT Contr By:	RACTOR AS PRINCIPAL (Seal) ractor's Name and Corporate Seal Signature Print Name Title	an authorize SURE Sure By:	ETY (Sety's Name and Corporate Seal Signature (Attach Power of Attorney) Print Name Title
CONT Contr By:	RACTOR AS PRINCIPAL (Seal) ractor's Name and Corporate Seal Signature Print Name Title Signature	an authorize SURE Sure By: Attest:	cty's Name and Corporate Seal Signature (Attach Power of Attorney) Print Name Title Signature Title

- 1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
- 2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
- 3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
- 4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with Contractor:
 - Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 - 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 - 3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
- 5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
- 6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2 Pay or arrange for payment of any undisputed amounts.
- 7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
- 8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use

the funds for the completion of the Work.

- 9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
- 10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.
- 11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
- 12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
- 13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.
- 14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

- 15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name*, *Address*, and *Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

Engineers Joint Documents Committee Design and Construction Related Documents Instructions and License Agreement

Instructions

Before you use any EJCDC document:

- Read the License Agreement. You agree to it and are bound by its terms when you use the EJCDC document.
- Make sure that you have the correct version for your word processing software.

How to Use:

- While EJCDC has expended considerable effort to make the software translations exact, it can be that a few document controls (e.g., bold, underline) did not carry over.
- Similarly, your software may change the font specification if the font is not available in your system. It will choose a font that is close in appearance. In this event, the pagination may not match the control set.
- If you modify the document, you must follow the instructions in the License Agreement about notification.
- 4. Also note the instruction in the License Agreement about the EJCDC copyright.

License Agreement

You should carefully read the following terms and conditions before using this document. Commencement of use of this document indicates your acceptance of these terms and conditions. If you do not agree to them, you should promptly return the materials to the vendor, and your money will be refunded.

The Engineers Joint Contract Documents Committee ("EJCDC") provides **EJCDC Design and Construction Related Documents** and licenses their use worldwide. You assume sole responsibility for the selection of specific documents or portions thereof to achieve your intended results, and for the installation, use, and results obtained from **EJCDC Design and Construction Related Documents**.

You acknowledge that you understand that the text of the contract documents of **EJCDC Design and Construction Related Documents** has important legal consequences and that consultation with an attorney is recommended with respect to use or modification of the text. You further acknowledge that EJCDC documents are protected by the copyright laws of the United States.

License:

You have a limited nonexclusive license to:

- Use EJCDC Design and Construction Related Documents on any number of machines owned, leased or rented by your company or organization.
- Use EJCDC Design and Construction Related Documents in printed form for bona fide contract documents.
- Copy EJCDC Design and Construction Related Documents into any machine readable or printed form for backup or modification purposes in support of your use of EJCDC Design and Construction Related Documents.

You agree that you will:

- Reproduce and include EJCDC's copyright notice on any printed or machine-readable copy, modification, or portion merged into another document or program. All proprietary rights in EJCDC Design and Construction Related Documents are and shall remain the property of EJCDC.
- Not represent that any of the contract documents you generate from EJCDC Design and Construction
 Related Documents are EJCDC documents unless (i)
 the document text is used without alteration or (ii) all additions and changes to, and deletions from, the text are clearly shown.

You may not use, copy, modify, or transfer EJCDC Design and Construction Related Documents, or any copy, modification or merged portion, in whole or in part, except as expressly provided for in this license. Reproduction of EJCDC Design and Construction Related Documents in printed or machine-readable format for resale or educational purposes is expressly prohibited.

If you transfer possession of any copy, modification or merged portion of EJCDC Design and Construction Related Documents to another party, your license is automatically terminated.

Term:

The license is effective until terminated. You may terminate it at any time by destroying **EJCDC Design and Construction Related Documents** altogether with all copies, modifications and merged portions in any form. It will also terminate upon conditions set forth elsewhere in this Agreement or if you fail to comply with any term or condition of this Agreement. You agree upon such termination to destroy **EJCDC Design and Construction Related Documents** along with all copies, modifications and merged portions in any form.

Limited Warranty:

EJCDC warrants the CDs and diskettes on which EJCDC Design and Construction Related Documents is furnished to be free from defects in materials and

workmanship under normal use for a period of ninety (90) days from the date of delivery to you as evidenced by a copy of your receipt.

There is no other warranty of any kind, either expressed or implied, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. Some states do not allow the exclusion of implied warranties, so the above exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

EJCDC does not warrant that the functions contained in EJCDC Design and Construction Related Documents will meet your requirements or that the operation of EJCDC Design and Construction Related Documents will be uninterrupted or error free.

Limitations of Remedies:

EJCDC's entire liability and your exclusive remedy shall be:

- 1. the replacement of any document not meeting EJCDC's "Limited Warranty" which is returned to EJCDC's selling agent with a copy of your receipt, or
- if EJCDC's selling agent is unable to deliver a replacement CD or diskette which is free of defects in materials and workmanship, you may terminate this Agreement by returning EJCDC Document and your money will be refunded.

In no event will EJCDC be liable to you for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use or inability to use EJCDC Design and Construction Related Documents even if EJCDC has been advised of the possibility of such damages, or for any claim by any other party.

Some states do not allow the limitation or exclusion of liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

General:

You may not sublicense, assign, or transfer this license except as expressly provided in this Agreement. Any attempt otherwise to sublicense, assign, or transfer any of the rights, duties, or obligations hereunder is void.

This Agreement shall be governed by the laws of the State of Virginia. Should you have any questions concerning this Agreement, you may contact EJCDC by writing to:

Arthur Schwartz, Esq. General Counsel National Society of Professional Engineers 1420 King Street Alexandria, VA 22314

Phone: (703) 684-2845

Fax: (703) 836-4875 e-mail: aschwartz@nspe.org

You acknowledge that you have read this agreement, understand it and agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement between us which supersedes any proposal or prior agreement, oral or written, and any other communications between us relating to the subject matter of this agreement.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by









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ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
 - 1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 - 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 - 3. Application for Payment—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 - 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 - 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 - 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 - 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 - 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 - 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 - 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 - 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

- 12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
- 13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
- 14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
- 15. Contractor—The individual or entity with whom Owner has entered into the Agreement.
- 16. Cost of the Work—See Paragraph 11.01 for definition.
- 17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
- 18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
- 19. *Engineer*—The individual or entity named as such in the Agreement.
- 20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
- 21. General Requirements—Sections of Division 1 of the Specifications.
- 22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
- 23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
- 24. Laws and Regulations; Laws or Regulations—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
- 25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
- 26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

- 27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
- 28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
- 29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
- 30. *PCBs*—Polychlorinated biphenyls.
- 31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
- 32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
- 33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
- 34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
- 35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
- 36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
- 37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- 38. Schedule of Submittals—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
- 39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

- 40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
- 41. Site—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
- 42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
- 43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
- 44. Substantial Completion—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
- 45. Successful Bidder—The Bidder submitting a responsive Bid to whom Owner makes an award.
- 46. Supplementary Conditions—That part of the Contract Documents which amends or supplements these General Conditions.
- 47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
- 48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
- 49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
- 50. Work—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
- 51. Work Change Directive—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

- A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. Intent of Certain Terms or Adjectives:
 - 1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

- 1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).
- E. Furnish, Install, Perform, Provide:

- 1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
- 2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
- 3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
- 4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

- 2.01 Delivery of Bonds and Evidence of Insurance
 - A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
 - B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.
- 2.02 *Copies of Documents*
 - A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.
- 2.03 Commencement of Contract Times; Notice to Proceed
 - A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 Starting the Work

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 Before Starting Construction

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents:
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 Preconstruction Conference; Designation of Authorized Representatives

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 Initial Acceptance of Schedules

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of

- the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
- 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
- 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 Reference Standards

- A. Standards, Specifications, Codes, Laws, and Regulations
 - 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies:

- 1. Contractor's Review of Contract Documents Before Starting Work: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
- 2. Contractor's Review of Contract Documents During Performance of Work: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
- 3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. Resolving Discrepancies:

- 1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 - 1. A Field Order;
 - 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 Reuse of Documents

- A. Contractor and any Subcontractor or Supplier shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 - 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 Electronic Data

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 Availability of Lands

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the

- Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 Subsurface and Physical Conditions

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 - the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 Differing Subsurface or Physical Conditions

- A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:
 - 1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
 - 2. is of such a nature as to require a change in the Contract Documents; or
 - 3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments:

- 1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
- 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
- 3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

- A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 - 1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
 - 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated:

- 1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- 2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 Reference Points

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 Hazardous Environmental Condition at Site

- A. Reports and Drawings: The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to

- permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 Performance, Payment, and Other Bonds

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 Licensed Sureties and Insurers

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 Certificates of Insurance

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 Contractor's Insurance

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
 - 1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners,

- employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
- include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
- 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
- 4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
- 5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
- 6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of

them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

- 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
- 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
- 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
- 5. allow for partial utilization of the Work by Owner;
- 6. include testing and startup; and
- 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 Waiver of Rights

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 Receipt and Application of Insurance Proceeds

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 Acceptance of Bonds and Insurance; Option to Replace

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 Partial Utilization, Acknowledgment of Property Insurer

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 Supervision and Superintendence

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 Labor; Working Hours

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 Services, Materials, and Equipment

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 Progress Schedule

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 Substitutes and "Or-Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. "Or-Equal" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items:

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;

2) will state:

- a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
- b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
- c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

- a) all variations of the proposed substitute item from that specified, and
- b) available engineering, sales, maintenance, repair, and replacement services; and
- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.
- 6.06 Concerning Subcontractors, Suppliers, and Others
 - A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
 - B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or

- entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 Patent Fees and Royalties

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its

- use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 Permits

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 Laws and Regulations

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner

and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

- Contractor shall confine construction equipment, the storage of materials and equipment, and
 the operations of workers to the Site and other areas permitted by Laws and Regulations, and
 shall not unreasonably encumber the Site and other areas with construction equipment or
 other materials or equipment. Contractor shall assume full responsibility for any damage to
 any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas
 resulting from the performance of the Work.
- 2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
- 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 Record Documents

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 Safety and Protection

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts

any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 Safety Representative

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 Hazard Communication Programs

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings:

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. Samples:

a. Submit number of Samples specified in the Specifications.

- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures:

- 1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
- 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

- Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
- 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the

Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;

- 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
- 4. use or occupancy of the Work or any part thereof by Owner;
- 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
- 6. any inspection, test, or approval by others; or
- 7. any correction of defective Work by Owner.

6.20 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 Delegation of Professional Design Services

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 Related Work at Site

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe

access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 Coordination

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 Legal Relationships

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

- 8.01 *Communications to Contractor*
 - A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.
- 8.02 Replacement of Engineer
 - A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.
- 8.03 Furnish Data
 - A. Owner shall promptly furnish the data required of Owner under the Contract Documents.
- 8.04 Pay When Due
 - A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.
- 8.05 Lands and Easements; Reports and Tests
 - A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 8.06 *Insurance*
 - A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.
- 8.07 *Change Orders*
 - A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.
- 8.08 Inspections, Tests, and Approvals
 - A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.
- 8.09 Limitations on Owner's Responsibilities
 - A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws

and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 Undisclosed Hazardous Environmental Condition

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 Evidence of Financial Arrangements

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 Compliance with Safety Program

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 Visits to Site

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 Project Representative

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 Authorized Variations in Work

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 Rejecting Defective Work

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 Shop Drawings, Change Orders and Payments

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 Determinations for Unit Price Work

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 Decisions on Requirements of Contract Documents and Acceptability of Work

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 Limitations on Engineer's Authority and Responsibilities

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of,

- and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 Compliance with Safety Program

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 Authorized Changes in the Work

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 Unauthorized Changes in the Work

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of

executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 Claims

- A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 - 1. deny the Claim in whole or in part;
 - 2. approve the Claim; or
 - 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. Costs Included: The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
 - 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 - 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

- 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
- 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.
- B. Costs Excluded: The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. Cash Allowances:
 - 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in

the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance:

- 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - Contractor believes that Contractor is entitled to an increase in Contract Price as a result of
 having incurred additional expense or Owner believes that Owner is entitled to a decrease in
 Contract Price and the parties are unable to agree as to the amount of any such increase or
 decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. Contractor's Fee: The Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 Change of Contract Times

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 Uncovering Work

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 Owner May Stop the Work

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 Correction or Removal of Defective Work

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,

- architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 Correction Period

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 Progress Payments

A. Applications for Payments:

- 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
- Beginning with the second Application for Payment, each Application shall include an
 affidavit of Contractor stating that all previous progress payments received on account of the
 Work have been applied on account to discharge Contractor's legitimate obligations
 associated with prior Applications for Payment.
- 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

- 1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
- 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's

review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
- c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
- 3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
- 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
- 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

- 1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
- 2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
- 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 Substantial Completion

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 Partial Utilization

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

- 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
- 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
- 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
- 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 Final Inspection

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 Final Payment

A. Application for Payment:

- 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
- 2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and

- d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 Final Completion Delayed

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 Waiver of Claims

- A. The making and acceptance of final payment will constitute:
 - 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 - 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 Owner May Terminate for Cause

- A. The occurrence of any one or more of the following events will justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 - 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 - 3. Contractor's repeated disregard of the authority of Engineer; or
 - 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
 - 1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

- 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
- 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 Owner May Terminate For Convenience

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other

dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

- 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 Contractor May Stop Work or Terminate

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

- 2. agrees with the other party to submit the Claim to another dispute resolution process; or
- 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 Computation of Times

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 Cumulative Remedies

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 Survival of Obligations

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 Controlling Law

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 Headings

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00 73 00 SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1. DEFINITIONS AND TERMINOLOGY

SC-1.01.A.12

Add the following language at the beginning of the definition entitled "Contract Documents" in the General Conditions:

"The Invitation to Bid, Instructions to Bidders"

SC-1.01.A.44

Delete the definition of Substantial Completion in the General Conditions in its entirety and add the following in its place:

"Substantial Completion – The Work required by the Contract has been completed except for work having a Contract Price of less than one percent of the then adjusted total contract price, or substantially all of the Work has been completed and opened to Owner's use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work required by the Contract."

SC-1.02.E

Delete paragraph 1.02.E of the General Conditions in its entirety and insert the following in its place:

"E. The words "furnish", "furnish and install", "install", and "provide" or words with similar meaning shall be interpreted, unless otherwise specifically stated, to mean "furnish and install complete in place and ready for service."

Add the following new paragraph immediately after paragraph 1.02.F of the General Conditions:

"G. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 Edition) have the meanings assigned to them in the General Conditions."

ARTICLE 2. PRELIMINARY MATTERS

SC-2.01

Delete paragraph 2.01.B of the General Conditions in its entirety and insert the following in its place:

- "B. Before any Work at the Site is started, Contractor shall deliver to Owner, with a copy to Engineer, certificates of insurance (and other evidence of insurance requested by Owner) which Contractor is required to purchase and maintain in accordance with the requirements of Article 5.
 - 1. Contractor shall include and identify on the certificate of insurance, indemnification as required by Article 6.20 of the General Conditions.
 - 2. Contractor acknowledges that Wright-Pierce and the Springfield Water and Sewer Commission (SWSC) have no responsibility as a generator, treater, storer, or disposer of hazardous or toxic substances, including but not limited to asbestos-cement pipe found or identified in connection with the Project. Contractor agrees to defend, indemnify, and hold harmless Wright-Pierce and the Springfield Water and Sewer Commission from any claim or liability, arising out of Contractor's performance of Work under the Agreement and made or brought against Wright-Pierce and the Springfield Water and Sewer Commission for any actual or threatened environmental pollution or contamination except to the extent that either Wright-Pierce and the Springfield Water and Sewer Commission has negligently caused or contributed to any such pollution or contamination. This indemnification includes reasonable attorney fees and expenses incurred by Wright-Pierce and the Springfield Water and Sewer Commission in defense of such claim."

SC-2.03

Delete paragraph 2.03.A of the General Conditions in its entirety and insert the following in its place:

"A. The Contract Times will commence to run on the date specified in the written Notice to Proceed."

ARTICLE 3. CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

SC-3.01

Add the following new paragraphs immediately after paragraph 3.01.A of the General Conditions:

- "1. Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.
- 2. Sections of Division 1 General Requirements govern the execution of the work of all sections of the specifications."

Add the following new paragraphs immediately after paragraph 3.01.C of the General Conditions:

"D. Priority/Conflict

1. Priority Among Contract Documents. In the event of conflict among the Contract Documents, the Contract Documents shall be construed according to the following priorities except as may otherwise be specifically stated:

Highest Priority: Modifications

Second Priority: Agreement

Third Priority: Addenda-later date to take precedence

Fourth Priority: Supplementary General Conditions

Fifth Priority: General Conditions

Sixth Priority: Drawings and Specifications

2. If there is a conflict between the Drawings and Specifications, the figured dimensions shall govern over the scaled dimensions. Detailed Drawings shall govern over the general Drawings. Larger scale Drawings shall take precedence over smaller scale Drawings. Drawings shall govern over Shop Drawings. Whenever there is a conflict concerning quality or quantity between or among notes, specifications, dimensions, details, or schedules in the Specifications or in the Drawings, or between the Specifications and the Drawings, or in all other instances not specifically noted above, the Contractor shall provide, unless otherwise directed by a

Modification of the Contract, the better quality or greater quantity of Work at no increase in the Contract Sum or in the Contract Times.

- E. It is the intent of the Specification and Contract Documents to obtain an operable Project. Equipment, components, systems, etc. therein shall be made operable by the Contractor.
- F. The Contract Drawings may be supplemented from time to time with additional Drawings by the Engineer as may be required to illustrate the Work or, as the Work progresses, with additional Drawings by the Contractor, subject to the approval of the Engineer. Supplementary Drawings, when issued by the Engineer or by the Contractor, after approval by the Engineer, shall be furnished in sufficient quantity to all those who, in the opinion of the Engineer, are affected by such Drawings."

ARTICLE 4. AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

SC-4.01

Delete Paragraph 4.01.B of the General Conditions in its entirety.

SC-4.02

Delete the words "The Supplementary Conditions" in paragraph 4.02.A of the General Conditions and replace with "Section 01 11 00 – Summary of Work".

Delete the words "the Supplementary Conditions" in the second sentence of paragraph 4.02.B of the General Conditions and replace with "Section 01 11 00 – Summary of Work".

SC-4.03

Delete paragraphs 4.03.A.1 and 4.03.A.2 in their entirety.

Add the following new paragraph immediately after paragraph 4.03.C of the General Conditions:

"D. Adjustments resulting from actual subsurface or latent physical conditions from those indicated will be in accordance with Massachusetts General Law, Chapter 30, Section 39N and the applicable provisions of the Contract Documents."

SC-4.04

Change "of" to "or" in paragraph 4.04.A.1 of the General Conditions.

Delete the following words from the first sentence of paragraph 4.04.B.1 of the General Conditions:

"or not shown or indicated with reasonable accuracy"

Delete the following words from the second sentence of paragraph 4.04.B.2 of the General Conditions:

"or not shown or indicated with reasonable accuracy"

Add the following new paragraph immediately after paragraph 4.04.B.2 of the General Conditions:

"3. The Owner, Engineer, and Engineer's Consultants shall not be liable to Contractor for any claims, costs, losses, or damages incurred or sustained by Contractor or in connection with any other project or anticipated project."

SC-4.05

Add the following new paragraph following paragraph 4.05.A of the General Conditions:

"B. Engineer may check the lines, elevations, reference marks, batter boards, etc., set by Contractor, and Contractor shall correct any errors disclosed by such check. Such a check shall not be considered as approval of Contractor's work and shall not relieve Contractor of the responsibility for accurate and satisfactory construction and completion of the entire Work. Contractor shall furnish personnel to assist Engineer in checking lines and grades."

SC-4.06

Delete the words "The Supplementary Conditions" in paragraph 4.06.A of the General Conditions and replace with "Section 01 11 00 – Summary of Work".

Delete the words "the Supplementary Conditions" in the second sentence of paragraph 4.06.B of the General Conditions and replace with "Section 01 11 00 – Summary of Work".

ARTICLE 5. BONDS AND INSURANCE

SC-5.01

Amend paragraph 5.01.B of the General Conditions by adding the following language to the end of the paragraph:

"Every bid bond, every performance bond, and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Massachusetts General Laws, Chapter 175, Section 105 or of a surety company authorized to do business in the Commonwealth of Massachusetts under the provisions of Massachusetts General Laws, Chapter 175, Section 106 and be approved by the U. S. Department of Treasury and acceptable as

sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308."

SC-5.03

Delete paragraph 5.03.B of the General Conditions in its entirety.

SC-5.04

The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

5.04.A.1 and 5.04.A.2 Worker's Compensation, etc. under paragraphs 5.04.A.1 and 5.04.A.2 of the General Conditions:

(1) Worker's Compensation

Coverage B (Each Accident) \$500,000

(2) Worker's Compensation

Disease (Each Employee) \$500,000

(3) Employer's Liability \$1,000,000 Each accident

\$1,000,000 Disease per employee

5.04.A.3, 5.04.A.4, and 5.04.A.5 Contractor's Liability Insurance under paragraphs 5.04.A.3 through 5.04.A.5 of the General Conditions which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of Contractor:

(1) General Aggregate

(Except Products—Completed Operations) \$3,000,000

(2) Products--Completed Operations

Aggregate \$1,000,000

(3) Personal and Advertising

Injury (Per Person/Organization) \$1,000,000

(4) Each Occurrence

(Bodily Injury and Property Damage) \$1,000,000

(5) Property Damage Liability

Insurance, including Collapse and Underground coverages. If blasting is to be used, also include explosion coverage. \$2,000,000

(6) Excess Liability:

General Aggregate \$5,000,000

Each Occurrence \$2,000,000

(6) Commercial Protective Liability:

General Aggregate \$10,000,000

Each Occurrence \$5,000,000

5.04.A.6 Automobile Liability:

(1) Bodily Injury:

Each Person \$1,000,000

Each Accident \$1,000,000

Property Damage:

Each Accident \$1,000,000

or

(2) Combined Single Limit (Bodily Injury and Property Damage):

Each Accident \$5,000,000

5.04.A.7 Pollution Liability

Combined single limit each occurrence \$1 Million

Annual Aggregate \$3 Million

5.04.A.8 Railroad Protective Liability (if required by an abutter, permittee, or other)

Each Occurrence \$2 Million

Aggregate \$6 Million

SC-5.04.B.3 The Contractual Liability coverage required by paragraph 5.04.B.3 in the General Conditions shall provide coverage for not less than the following amounts:

Water Infrastructure Improvements at Liberty Street and Westford Circle

SWSC Bid No. 24-67

(1) General Aggregate \$5,000,000

(2) Each Occurrence (Bodily Injury and Property Damage) \$1,000,000

Builder's Risk (Fire Insurance) in an amount equal to the insurable value of the Contract.

SC-5.05

Delete paragraph 5.05. of the General Conditions in its entirety and insert the following in its place:

"5.05A.Contractor shall name the following as additional insured with full coverage as described above, THE SPRINGFIELD WATER AND SEWER COMMISSION, Wright-Pierce, and its affiliates, successors, and/or assigns as named insured."

SC-5.06

Delete the first sentence of Paragraph 5.06.A of the General Conditions and replace with the following:

"A. Contractor shall purchase and maintain property insurance upon the Work at the Site, written on the completed value form, in an amount equal to the total bid price for the completed construction."

Delete the last sentence in paragraph 5.06.A and paragraphs 5.06.A.1 through 5.06.A.7, 5.06.B, and 5.06.C.

SC-5.07

Delete paragraph 5.07.B of the General Conditions in its entirety.

Delete paragraph 5.07.C of the General Conditions in its entirety.

SC-5.08

Delete paragraph 5.08.B of the General Conditions in its entirety.

SC-5.10

Delete paragraph 5.10.A of the General Conditions in its entirety.

ARTICLE 6. CONTRACTOR'S RESPONSIBILITIES

SC-6.02

Add the following new paragraphs immediately after paragraph 6.02.B of the General Conditions:

- "C. Regular working hours shall be defined as 8 hours per day, Monday through Friday, excluding holidays, between the hours of 7:00 AM and 4:00 PM. Requests to work other than regular working hours shall be submitted to Engineer and Owner not less than 48 hours prior to any proposed weekend work or scheduled extended work weeks. Occasional unscheduled overtime on weekdays may be permitted provided two hours notice is given to Engineer.
- D. Contractor shall reimburse Owner for additional engineering and/or inspection costs incurred as a result of unscheduled overtime work in excess of the regular working hours stipulated in paragraph SC-6.02.C or otherwise allowed by the Owner. At Owner's option, such costs may either be deducted from the Contractor's monthly payment request or deducted from retention prior to release of final payment."

SC-6.06

Delete the words "Supplementary Conditions" in the first sentence of paragraph 6.06.B of the General Conditions and replace with "Instructions to Bidders".

Add the following new paragraph immediately after paragraph 6.06.C.2 of the General Conditions:

"3. Contractor shall make payments to subcontractors in accordance with Massachusetts General Laws, Chapter 30, Section 39F."

Add the following new paragraph immediately following paragraph 6.06.D of the General Conditions:

"1. Owner or Engineer may furnish to any such Subcontractor, Supplier, or other person or organization, to the extent practicable, information about amounts paid to Contractor in accordance with Contractor's Applications for Payment on account of the particular Subcontractor's, Suppliers, other person's, or other organization's Work."

Delete paragraph 6.06.G of the General Conditions in its entirety and replace with the following:

"G. All Work performed for Contractor by a Subcontractor shall be pursuant to an appropriate agreement between the Contractor and Subcontractor. The Subcontractor shall not commence Work until the Contractor has obtained all insurance as required by Paragraphs 5.02 through 5.03 inclusive. the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the

officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work."

SC-6.07

Delete paragraphs 6.07.A, 6.07.B, and 6.07.C in their entirety and replace with the following:

"A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, products or device which is the subject of patent rights or copyrights held by others. Contractor shall indemnify and hold harmless Owner and Engineer, and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses, including attorney's fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or furnished by them in fulfillment of the requirements of this Contract. In the event of any claim or action by law on account of such patents or fees, it is agreed that the Owner may retain out of the monies which are or which may become due the Contractor under this Contract, a sum of money sufficient to protect itself against loss, and to retain the same until said claims are paid or are satisfactorily adjusted."

SC-6.08

Delete the words "or, if there are no Bids...to the Work" from the third and fourth sentences of paragraph 6.08.A of the General Conditions and replace with "and the Contractor shall pay all charges of utility owners for connections to the Work".

Add the following language at the end of Paragraph 6.08.A of the General Conditions:

"The following permits and/or licenses will be obtained by the Owner:

1. Refer Section 01 41 00 – Regulatory Requirements for more information."

SC-6.09

Delete paragraph 6.09.B of the General Conditions in its entirety and replace with the following:

"B. If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, they shall give Engineer prompt written notice thereof. If Contractor performs any Work knowing it to be contrary to such Laws or Regulations, and without such notice to Engineer, they shall bear all costs arising therefrom. The Contractor shall, at all times, observe and comply with and shall cause all their agents and employees and all their Subcontractor to observe and comply with all such existing Laws or Regulations, and shall protect and

indemnify the Owner and the Engineer and the municipalities in which Work is being performed, and their officers and agents against any claim, civil penalty, fine or liability arising from or based on the violation of any such Law or Regulation, whether by themselves or their employees or any of their Subcontractors."

SC-6.10

Add the following new paragraph immediately after paragraph 6.10.A of the General Conditions:

"1. The materials and supplies to be used in the Work under this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. Contractor shall obtain the proper certificates, maintain the necessary records, and otherwise comply with all applicable requirements governing the exemption from sales tax."

SC-6.13

After the word "Contractor" in the first sentence of paragraph 6.13.B of the General Conditions, insert the words ", subject to provisions of paragraph 6.09.B".

SC-6.17

Add the following new paragraph immediately after paragraph 6.17.E of the General Conditions:

"F. The accuracy of all such information submitted by the Contractor is the responsibility of the Contractor. In reviewing Shop Drawings, Samples, and similar submittals, the Engineer shall be entitled to rely upon the Contractor's representation that such information is correct and accurate."

SC-6.19

After the first sentence of paragraph 6.19.A of the General Conditions, insert the following:

"All materials or equipment delivered to the Site shall be accompanied by certificates, signed by an authorized officer of the supplier, and notarized guaranteeing that the materials or equipment conform to specification requirements. Such certificates shall be immediately turned over to the Engineer. Materials or equipment delivered to the Site without such certificates will be subject to rejection."

SC-6.20

After the words "claims, costs" in the first sentence of paragraph 6.20.A of the General Conditions insert the words ", civil penalties, fines,".

Add the following new paragraph immediately after paragraph 6.20.C.2 of the General Conditions:

"3. Nothing in the Contract Documents shall create or give to third parties any claim or right of action against the Contractor, the Owner, or the Engineer beyond such as may legally exist irrespective of the Contract."

SC-6.21

Add the following new paragraph immediately after Paragraph 6.21.E

"6.21.E Contractor shall comply with all applicable provisions of the Massachusetts General Laws, Chapter 30, Section 39R regarding Contractor's records."

ARTICLE 7. OTHER WORK AT THE SITE

SC-7.02

Delete paragraph 7.02 of the General Conditions in its entirety.

SC-7.03

Delete the words "Owner and" from paragraph 7.03.B of the General Conditions.

Delete the words "Owner and" from paragraph 7.03.C of the General Conditions.

Add the following new paragraph immediately after paragraph 7.03.C of the General Conditions:

"D. Should Contractor cause damage to the work or property of any separate contractor at the site, or should any claim arising out of Contractor's performance of the Work at the site be made by any separate contractor against Contractor, Owner, Engineer, Engineer's Consultants, or any other person, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by law. Contractor shall, to the fullest extent permitted by Laws and Regulations, defend, indemnify and hold Owner, Engineer, and Engineer's Consultants, harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of engineers, architects, attorneys, and other professionals, and court costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any separate contractor against Owner, Engineer, or Engineer's Consultants, to the extent based on a claim arising out of the Contractor's performance of the Work. Should a separate contractor cause damage to the Work or property of Contractor or should the performance of Work by any separate contractor at the site give rise to any other claim, Contractor shall not institute any action, legal or equitable, against Owner, Engineer, or Engineer's Consultants or permit any action against any of them to be maintained and continued in its name or for its benefit in any court which seeks to impose liability on or to recover damages from Owner, Engineer, or Engineer's Consultants, on such damage or claim. If Contractor is delayed at any time in performing or furnishing Work by any act or

neglect of a separate contractor and Owner and Contractor are unable to agree to the extent of any adjustment in Contract Times attributable thereto, Contractor may make a claim for an extension of times in accordance with Article 12.02. The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the Owner, the Engineer, or the Engineer's consultants on account of any delay in the performance or furnishing of the Work and/or any delay or suspension of any portion of the Work, whether such delay is caused by the Owner, the Engineer, the Engineer's consultants or otherwise. The Contractor acknowledges that the Contractor's sole remedy for any such delay and/or suspension will be an extension of time in accordance with Article 12.02."

ARTICLE 8. OWNER'S RESPONSIBILITIES

SC-8.06

Delete paragraph 8.06 of the General Conditions in its entirety.

SC-8.07

Delete paragraph 8.07 of the General Conditions in its entirety.

SC-8.11

Delete paragraph 8.11 of the General Conditions in its entirety.

ARTICLE 9. ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.01

Delete paragraph 9.01.A of the General Conditions in its entirety and replace with the following:

"A. Engineer will be the Owner's representative during the construction period, and their instructions shall be carried into effect promptly and efficiently."

SC-9.03

Add the following new paragraph immediately after paragraph 9.03.A of the General Conditions:

"1. Engineer will furnish a Resident Project Representative and assistants to assist Engineer in observing the performance of the Work. The duties and responsibilities of the Resident Project Representative will be as enumerated in a document entitled "Duties, Responsibilities, and Limitations of the Authority of Resident Project Representative" and will be made available to Contractor at the start of his work."

SC-9.04

Add the following new paragraph immediately after paragraph 9.04.A of the General Conditions:

"1. Engineer's interpretations will be made in accordance with Massachusetts General Laws, Chapter 30, Section 39P."

SC-9.09

Add the following new paragraphs immediately after paragraph 9.09.E of the General Conditions:

- "F. Except upon written instructions of the Engineer, the Resident Project Representative:
 - 1. Shall not authorize any deviation from the Contract Documents or approve any substitute materials or equipment.
 - 2. Shall not exceed limitations of Engineer's authority as set forth in the Contract Documents.
 - Shall not undertake any of the responsibilities of Contractor,
 Subcontractors, or Contractor's superintendent, or expedite the Work.
 - 4. Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences, or procedures of construction unless such is specifically called for in the Contract.
 - 5. Shall not advise on or issue directions as to safety precautions and programs in connection with the Work."

ARTICLE 10. CHANGES IN THE WORK; CLAIMS

SC-10.01A

Add the following new paragraph immediately after paragraph 10.01.A of the General Conditions:

"1. Upon request of the Owner or the Engineer, the Contractor shall without cost to the Owner submit to the Engineer, in such form as the Engineer may require, an accurate written estimate of the cost of any such proposed extra Work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the Engineer. The contractor shall promptly revise and resubmit such estimate if the Engineer determines that it is not in compliance

with the requirements of this Article, or that it contains errors of fact or mathematical errors. If required by the Engineer, in order to establish the exact cost of new Work added or previously required Work omitted, the Contractor shall obtain and furnish to the Engineer bona fide proposals from recognized suppliers for furnishing any material included in such Work. Such estimates shall be furnished promptly so as to occasion no delay in the Work, and shall be furnished at the Contractor's expense. The Contractor shall state in the estimate any extension of time required for the completion of the Work if the change or extra work is ordered."

ARTICLE 11. COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-11.01

After the words "in Paragraph 11.01.B" in the last sentence of paragraph 11.01.A of the General Conditions, add the words "or claims for extra cost shall be considered based on an escalation of labor costs throughout the period of the Contract".

In the second sentence of paragraph 11.01.A.1 delete the word "superintendents".

Add the following sentence to the end of paragraph 11.01.A.2 of the General Conditions:

"No claims for extra cost shall be considered based on an escalation of material costs throughout the period of the Contract."

Delete the second sentence of paragraph 11.01.A.3 of the General Conditions in its entirety.

Delete paragraph 11.01.A.4 of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.a of the General Conditions in its entirety.

Add the following sentence immediately before the last sentence of paragraph 11.01.A.5.c of the General Conditions:

"These rates shall include all fuel, lubricants, insurance, etc. Equipment rental charges shall not exceed the prorated monthly fuel rental rates listed in the current edition of the Rental Rate Blue Book date from Equipment Watch or other mutually agreed upon method. Charges per hour shall be determined by dividing the monthly rates by 176."

Delete paragraph 11.01.A.5.f of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.g of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.h of the General Conditions in its entirety.

SC-11.03

Delete the words "materially and significantly" from paragraph 11.03.D.1 and insert the words "by more than plus or minus twenty percent (20%)".

ARTICLE 12. CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIME

SC-12.03

In the second sentence of paragraph 12.03.A of the General Conditions, replace the words "include, but not be limited to," with "limited to".

Delete paragraph 12.03.B of the General Conditions in its entirety.

ARTICLE 13. TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-13.03

Delete paragraph 13.03.B of the General Conditions in its entirety and replace with the following:

"B. Owner shall employ and pay for inspections and testing services specifically noted as such in the Contract. All others required shall be the responsibility of the Contractor."

Delete paragraph 13.03.C of the General Conditions in its entirety and replace with the following:

"C. If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any Work to be specifically inspected, tested, or approved by some public body, Contractor shall assume full responsibility therefore, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection, testing, or approval."

Add the following new paragraph immediately after paragraph 13.03.F of the General Conditions:

"G. The Owner reserves the right to independently perform at its own expense, laboratory tests on random samples of material or performance tests on equipment delivered to the Site. These tests, if made, will be conducted in accordance with the appropriate referenced standards or Specification requirements. The entire shipment represented by a given sample, samples, or piece of equipment may be rejected on the basis of the failure of samples or pieces of equipment to meet specified test requirements. All rejected materials or equipment shall be removed from the Site, whether stored or installed in the

Work, and the required replacement shall be made, all at no additional cost to the Owner."

SC-13.05

After the words "conform to the Contract Documents" in the first sentence of paragraph 13.05.A of the General Conditions, add the words "or if the Work interferes with the operation of the existing facility".

Add the following sentence to the end of paragraph 13.05.A of the General Conditions:

"If Owner stops work pursuant to this paragraph, Contractor shall be entitled to no extension of Contract Times or increase in Contract Price."

SC-13.06

Add the following new paragraph immediately after paragraph 13.06.B of the General Conditions:

"C. At any time during the progress of the Work and up to the date of final acceptance, the Engineer shall have the right to reject any Work which does not conform to the requirements of the Contract Documents, even though such Work has been previously inspected and paid for. Any omissions or failure on the part of the Engineer to disapprove or reject any Work or materials at the time of inspection shall not be construed as an acceptance of any defective Work or materials."

ARTICLE 14. PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.01

Add the following new paragraphs immediately after paragraph 14.01.A of the General Conditions:

- "B. The Contractor shall submit for the Engineer's approval, a complete breakdown of all lump sum items in the Proposal. This breakdown, modified as directed by the Engineer, will be used as a basis for preparing estimates and establishing progress payments.
- C. Two lump sum payments each equal to 1% of the total Bid Price (to include all bonds, insurance, move-on expenses, etc.) will be allowed for 'mobilization' as progress payment line items. The actual costs of bonds and insurance (up to the maximum payment of 1%) will be considered in the initial payment request provided that cost documentation suitable to the Engineer is furnished by the Contractor. Any outstanding balance of the mobilization line item will be payable

when the Project Work is 10% complete as indicated by the approved progress payments (less cost of mobilization and stored equipment)."

SC-14.02

Add the following new paragraphs immediately after paragraph 14.02.A.1 of the General Conditions:

- "a. Only the following items of material and equipment will be accepted for delivery at the site or at a local bonded warehouse and included in progress estimates in advance of actual requirement, subject to all conditions stated below.
 - i. Pre-Cast Concrete Special Structures.
- b. Materials and equipment listed above will not be included in progress estimates until the requirements stated herein have been fulfilled.
- c. The Contractor must present an invoice to the Engineer for each item of material or equipment he is requesting payment for. The invoice must be broken down to show the costs for the actual materials.
- d. Sufficient monies have been allocated in the payment requisition line items to cover all of the costs listed in "a" above, plus the costs of physically installing the items of work.
- e. The materials have been submitted and approved for use in this Project.
- f. The Contractor has, at the time of delivery, given the Engineer written notice of the delivery using the form provided by the Engineer.
- g. The material is acceptably stored and protected. Storage in a bonded warehouse will require proof of bonding, and insurance coverage specifically for the item being stored.
- h. The manufacturer's short and/or long term storage requirements have been received by the Engineer, prior to payment.
- i. The Contractor has established a program to implement the manufacturer's required storage procedures. Said program to consist of at the very least a written schedule of daily, weekly, monthly, routine maintenance requirements for each piece of equipment. A copy of this schedule to be presented to the Engineer prior to each requisition submittal, signed by the Contractor, stating that the required maintenance has been performed.
- j. Signed, notarized Title Transfers, format to be furnished by the Engineer, must be furnished for each item of equipment.

k. When the above have been complied with to the satisfaction of the Engineer, payment will be authorized for the full invoice values of the item, less normal retainage and less all costs for O&M Manuals, installation, incidental items included for payment, spare parts, start-up certification, training, testing, final acceptance testing, and installation."

Delete paragraph 14.02.A.3 of the General Conditions in its entirety and replace with the following:

"3. Progress payment request shall include the percentage of the total amount of the Contract which has been completed from the start-up of the Project to and including the last day of the preceding month, or other mutually agreed upon day of the month accompanied by such data and supporting evidence as Owner or Engineer may require."

Add the following new paragraphs immediately after paragraph 14.02.A.3 of the General Conditions:

- "4. Forms to be used shall be prepared by the Contractor and submitted to the Engineer for approval.
- 5. At the option of the Owner, partial payment up to the estimated value, less retainage, may be allowed for any materials and equipment not incorporated in the Work, pursuant to the following conditions:
 - a. Major equipment items stored off site shall be stored in a bonded warehouse and properly maintained during storage.
 - b. Equipment or materials stored on the Site shall be properly stored, protected, and maintained.
 - c. For any partial payment the Contractor shall submit, with their monthly progress payment from each material or equipment manufacturer, bills or invoices indicating actual material cost.
 - d. Contractor shall submit evidence that they have paid for materials or equipment stored and for which the Engineer has authorized partial payment and previous progress payments, prior to submission of the next monthly payment request."

Delete the words "10 days" from the first sentence of paragraph 14.02.B.1 of the General Conditions and insert the words "30 days".

Delete the words "as provided in the Agreement" from paragraph 14.02.D.3 of the General Conditions and insert the words "equal to the federal funds rate as established from time to time by the Federal Open Market Committee of the United States Federal Reserve".

SC-14.04

Delete paragraphs 14.04.A through 14.04.D of the General Conditions in their entirety and replace with the following:

"A. Contractor may, in writing to Owner and Engineer, certify that the entire Project is substantially complete and request that Engineer issue a certificate of Substantial Completion. Within a reasonable time thereafter, Owner, Contractor, and Engineer shall make an inspection of the Project to determine the status of completion. If Engineer and Owner do not consider the Project substantially complete, Engineer will notify Contractor in writing giving their reasons therefor. If Engineer and Owner consider the Project substantially complete, Engineer will prepare and deliver to Owner a tentative certificate of Substantial Completion and the responsibilities between Owner and Contractor for maintenance, heat, and utilities. There shall be attached to the certificate a tentative list of items to be completed or corrected before Substantial Completion, and the certificate shall fix the time within which such items shall be completed or corrected, said time to be within Contract Time."

SC-14.05

Delete paragraph 14.05.A of the General Conditions in its entirety and replace with the following:

"A. Prior to Substantial Completion of the Project, Owner may request Contractor in writing to permit them to use a specified part of the Project which they believe they may use without significant interference with construction of the other parts of the Project. If Contractor agrees, they will certify to Owner and Engineer that said part of the Project is substantially complete and request the Engineer to issue a certificate of Substantial Completion for that part of the Project. Within a reasonable time thereafter, Owner, Contractor, and Engineer shall make an inspection of that part of the Project to determine its status of completion. If Engineer and Owner do not consider that it is substantially complete, Engineer will notify Contractor in writing giving their reasons therefor. If Engineer and Owner consider that part of the Project to be substantially complete, Engineer will execute and deliver to Owner and Contractor a certificate to that effect, fixing the date of Substantial Completion as to that part of the Project, attaching thereto a tentative list of items to be completed or corrected before Substantial Completion of the entire Project, and fixing the responsibility between Owner and Contractor for maintenance, heat, and utilities as to that part of the Project. Owner shall have the right to exclude Contractor from any part of the Project which Engineer has so certified to be substantially complete, but Owner shall allow Contractor reasonable access to complete items on the tentative list".

ARTICLE 15. SUSPENSION OF WORK AND TERMINATION

SC-15.01

Delete paragraph 15.01.A of the General Conditions in its entirety and insert in place thereof the following:

"A. Owner may order, at any time and without cause, suspension of the Work in accordance with Massachusetts General Laws, Chapter 30, Section 390."

Insert the following new paragraph immediately after paragraph 15.01.A of the General Conditions:

"B. Should the Owner suspend Work due to repeated unsafe Work conducted by the Contractor which is confirmed by subsequent inspection by OSHA, the Contractor shall not be allowed any adjustment in Contract Price or extension of Contract Times attributed to this delay."

SC-15.02

After the word "jurisdiction" in paragraph 15.02.A.2 of the General Conditions, add the words "(including those governing employee safety)".

Delete paragraph 15.02.D of the General Conditions in its entirety.

SC-15.05

Add the following new paragraphs immediately after paragraph 15.04 of the General Conditions:

"15.05 Assignment of Contract

A. Contractor shall not assign, transfer, convey or otherwise dispose of the Contract, or of their legal right, title, or interest in or to the same or to any part thereof, without the prior written consent of the Owner. Contractor shall not assign by power of attorney or otherwise any monies due to them and payable under this Contract without the prior written consent of the Owner. Such consent, if given, will in no way relieve the Contractor from any of the obligations of this Contract. Owner shall not be bound to abide by or observe the requirements of any such assignment."

ARTICLE 16. DISPUTE RESOLUTION

SC-16.01

Delete paragraph 16.01 of the General Conditions in its entirety and insert in place thereof the following:

- "A. It is the express intention and agreement of the parties that all disputes related to this Agreement or to any rights or any relationship between the parties arising therefrom shall be solely and exclusively initiated and maintained through legal proceedings in the courts of the Commonwealth located in Hampden County, Massachusetts. The Contractor and Owner each irrevocably consents to the jurisdiction of such courts in any such actions or proceedings, and waives its right to a trial by jury.
- B. Contractor shall carry on the Work and maintain the progress schedule during the dispute resolution proceedings, unless otherwise agreed by Contractor and Owner in writing."

ARTICLE 17. MISCELLANEOUS

SC-17.01

Add the following new paragraph immediately after paragraph 17.01.A of the General Conditions:

"B. No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract. Any notice to the Contractor, from Owner and Engineer, relative to any part of this Contract shall be in writing."

SC-17.06

Add the following sentence to 17.06.A: "The headings or titles of any article, paragraph, subparagraph, section, or part of the Contract Documents shall not be deemed to limit or restrict the article, paragraph, section, or part."

Add the following new paragraphs immediately after paragraph 17.06 of the General Conditions:

"17.07 Legal Address of Contractor

A. Contractor's business address and his office at or near the site of the Work are both hereby designated as places to which communications shall be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the Post Office Department or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon Contractor, and the date of such service shall be the date of receipt. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor and delivered to Engineer. Service of any

notice, letter, or other communication upon the Contractor personally shall likewise be deemed sufficient service.

17.08 Wage Rates

- A. The requirements and provisions of all applicable laws and any amendments thereto as to the employment of labor, and the schedules of minimum wage rates established in accordance with such laws shall be a part of these Contract Documents.
- B. The said schedules of wages shall continue to be the minimum rates to be paid during the life of this contract and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the Work."

SC-18

Add the following new paragraphs immediately after Article 17 of the General Conditions:

"ARTICLE 18 - LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE WORK ON TIME

18.01 Liquidated Damages

- A. If the Contractor shall fail to complete the Work within the Contract Times, or extension of time granted by the Owner in accordance with Article 12, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Contract for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.
- B. The Contractor shall not be charged with liquidated damages or any excess cost when delay in completion of the Work is due to the following and the Contractor has promptly given written notice of such delay to the Owner or Engineer.
- C. To any preference, priority, or allocation order duly issued by the Owner.
- D. To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes; and abnormal and unforeseeable weather; and
- E. To any delays of Subcontractors occasioned by any of the causes specified in Paragraphs 18.01.C and 18.01.D of this Article."

PART II – ADDITIONAL PROVISIONS

SWSC Bid No. 24-67

State Government Provisions included herein have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other Water Infrastructure Improvements at Liberty Street and Westford Circle

provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with paragraph SC-3.01 of the Supplementary Conditions.

1.1. Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision violation of the foregoing shall be deemed null, void and of no effect.

2.0. MASSACHUSETTS WAGE RATES

- 2.1. Minimum Wage Rates as determined by the Commissioner of Department of Labor and Industries under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27D, as amended, apply to this project. It is the responsibility of the Contractor, before the bid opening, to request if necessary, any additional information on Minimum Wage Rates for those tradespeople who may be employed for the proposed work under this Contract.
- 2.2 The schedule of Minimum Wage Rates is included in the Supplementary Conditions Part IV Wage Determination Schedules.

3.0. CHANGE ORDERS

3.1. Following the Notice of Award and prior to execution of the Contract the prospective contractor shall submit to the Engineer for review documentation that will assist in developing the markup percentage to be used as Direct Labor. Prior to execution of the Contract by the Owner, the prospective contractor will work out an agreement on what percentage markup shall be used as Direct Labor Costs and this agreement shall become a part of the Contract Documents at the time the Contract is executed.

4.0. RECORD DRAWINGS

4.1. The Owner shall be responsible for the preparation of all record drawings required by this Contract. This responsibility may be delegated to the Owner's representative. The responsibility for preparation of record drawings shall not be delegated or transferred to the Contractor. The preparation and maintenance of as-built drawings and as-built data remains the responsibility of the Contractor and shall be maintained and provided to the Engineer as specified elsewhere in the Technical Specifications.

- 5.0. UTILITY UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
- 5.1. All excavation within public or private ways are subject to the requirements of Massachusetts General Laws, Chapter 82, Section 40.
- 6.0 AMERICAN IRON AND STEEL REQUIREMENTS
- 6.1 Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this Project. The amendments to the Clean Water Act, as part of WRRDA, apply the American Iron and Steel (AIS) requirements to all treatment works projects. Compliance with AIS is required in accordance with Public Law 113-76, the Consolidated Appropriations Act of 2014. All iron and steel products used in this Project must be produced in the United States. The term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

END OF SECTION

CONSTRUCTION BID SPECIFICATIONS SPECIAL PROVISIONS FOR DISADVANTAGED BUSINESS ENTERPRISES MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF MUNICIPAL SERVICES

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM BACKGROUND

In May 2008 a United States Environmental Protection Agency (EPA) rule became effective that changed the Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) Program to a Disadvantaged Business Enterprise (DBE) Program.

For firms to qualify under the old MBE/WBE program they needed to be socially disadvantaged and had to be certified by the Supplier Diversity Office (SDO). Under the new DBE rule, the firms must be both **socially** and **economically** disadvantaged, **citizens of the United States**, and certified as a DBE. Women and certain minorities are presumed to be socially disadvantaged. The economic disadvantage is measured by the owner's initial and continuing personal net worth of less than \$1,320,000.

Because the Clean Water Act requires the use of MBEs and WBEs, these firms will still be utilized in the State Revolving Fund (SRF) Loan Program, but they must also be certified as DBEs.

SDO will continue to be the certifying agency for the SRF program. SDO certifies firms under the federal Department of Transportation program, which is acceptable for use in the SRF program. An additional form has been added to the DBE package to verify that DBEs are owned or controlled by United States citizens.

BID SPECIFICATIONS

In this contract, the percentage of business activity to be performed by disadvantaged business enterprise(s) (DBE) shall not be less than the following percentages of the total contract price or the percentage submitted by the contractor in the Schedule of Participation, whichever is greater:

Disadvantaged MBE (D/MBE) 4.2% Disadvantaged WBE (D/WBE) 4.5%

II. **DEFINITIONS**

For the purpose of these provisions, the following terms are defined as follows:

- A. <u>Awarding Authority</u> Entity that awards a prime contract under a State Revolving Fund loan.
- B. <u>Bidder</u> Any individual, partnership, joint venture, corporation, or firm submitting a price, directly or through an authorized representative, for the purpose of performing construction or construction related activities under a Contract.
- C. Certified DBE A DBE certified by the United States Small Business Administration, under its 8(a) Business Development Program (13 CFR part 124, subpart A) or its Small Disadvantaged Business Program (13 CFR part 124, subpart B); The United States Department of Transportation (DOT), under its regulations for Participation by DBSs in DOT programs (49 CFR parts 23 and 26); or SDO in accordance with 40 CFR part 33; provided that the certification meets the U.S. citizenship requirement under 40 CFR §33.202 or §33.203.
- D. <u>Compliance Unit</u> A subdivision of MassDEP's Affirmative Action Office designated to ensure compliance under these provisions.
- E. <u>Contractor</u> Any business that contracts or subcontracts for construction, demolition, renovation, survey, or maintenance work in the various classifications customarily used in work and that is acting in this capacity under the subject contract.
- F. <u>Construction Related Services</u> Those services performed at the work site ancillary to, and/or in support of, the construction work, such as hauling, trucking, equipment operation, surveying or other technical services, etc. For the purposes hereof, supply and delivery of materials (e.g. pre-cast concrete elements) to the site by a supplier who has manufactured those goods, or substantially altered them before re-sales shall be considered as "construction related services
- G. <u>Construction Work</u> The activities at the work site, or labor and use of materials in the performance of constructing, reconstructing, erecting, demolishing, altering, installing, disassembling, excavating, etc, all or part of the work required by the Contract Documents.
- H. <u>Disadvantaged Business Enterprise</u> (DBE) An entity owned or controlled by a socially and economically disadvantaged individual as described by Public Law 102-389 (42 U.S.C. 4370d) or an entity owned and controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note); a Small Business Enterprise (SBE); a Small Business in a Rural Area (SBRA); or a Labor Surplus Area Firm (LAF), a Historically Underutilized Business (HUB) Zone Small Business Concern, or a concern under a successor program.

- I. <u>Equipment Rental Firm</u> A firm that owns equipment and assumes actual and contractual responsibility for renting said equipment to perform a useful function of the work of the contract consistent with normal industry practice
- J. Good Faith Efforts The race and/or gender neutral measures described in 40 CFR 33, subpart C.
- K. <u>HUBZone</u> A historically underutilized business zone, which is an area located within one or more qualified census tracts, qualified metropolitan counties, or lands within the external boundaries of an Indian reservation.
- L. <u>HUBZone small business concern</u> A small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.
- M. <u>Joint Venture -</u> An agreement between SDO certified DBE and a non-DBE or non-DBE controlled enterprise.
 - 1. A pairing of companies will be considered a DBE joint venture if the SDO certified DBE which is part of the relationship has more than 51% of the profits that are derived from that project.
 - 2. A joint venture between a certified DBE subcontractor and a non DBE subcontractor, in which the DBE for that proportion of the joint venture's contract equal to the DBE participation in the joint venture.
 - 3. Whenever a general bid is filed by a joint venture with a certified DBE participant in the joint venture that does not exercise more than 51% control over management and profits, that joint venture shall be entitled to credit as a DBE for that portion of the joint venture's contract equal to the DBE participation in the joint venture. Minority As deemed by SDO.
- N. <u>Labor surplus area firm (LSAF)</u> A concern that together with its first-tier subcontractors will perform substantially in labor surplus areas (as identified by the Department of Labor in accordance with 20 CFR part 654). Performance is substantially in labor surplus areas if the costs incurred under the contract on account of manufacturing, production or performance of appropriate services in labor surplus areas exceed 50 percent of the contract price.
- O. <u>Letter of Intent</u> Certified document signed by the principal(s) of the DBE with respect to the work to be performed under contract.
- P. <u>Local Government Unit (LGU)</u> A city, town, or municipal district which applies for a loan under the Clean Water Trust Program.
- Q. <u>Material Supplier</u> A vendor certified by SDO as a DBE in sales to supply industry from an established place of business or source of supply, and that vendor.

- 1. Manufactures goods from raw materials, or substantially utilizes them in the work, or substantially alters them before resale, entitling the general contractor to DBE credit for 100% of the purchase order.
- 2. Provides and maintains a storage facility for materials utilized in the work, entitling the general contractor to DBE credit for 10% of the purchase order
- R. <u>Minority and Women Business Enterprise (M/WBE)</u> Any business concern certified by the SDO as a bona-fide M/WBE. A bona-fide M/WBE is a business whose minority group/women ownership interests are real, which have at least 51% ownership <u>and</u> control over management and operation.
- S. <u>Percent of Total Price</u> Is the percentage to be paid to the DBE, work they perform, as compared to the total bid price
- T. Recipient An agency, person or political subdivision which has been awarded or received financial assistance by the Trust or MassDEP.
- U. <u>Small business</u>, small business concern or small business enterprise (SBE) A concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding, and qualified as a small business under the criteria and size standards in 13 CFR part 121.
- V. <u>Small business in a rural area (SBRA)</u> A small business operating in an area identified as a rural county with a code 6-9 in the Rural-Urban continuum Classification Code developed by the United States Department of Agriculture in 1980.
- W. <u>SDO</u> The Supplier Diversity Office.
- X. <u>Subcontractor</u> A company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.
- Y. <u>Total Contract Price</u> The total amount of compensation to be paid for all materials, work or services rendered in the performance of the contract
- Z. Trust The Massachusetts Clean Water Trust established by M.G.L. c.29.

III. REQUIREMENTS FOR CONTRACT AWARD

DBE packages must be submitted by the two lowest bidders on the project. Following bid opening, the LGU shall notify the two lowest bidders to submit DBE packages to the LGU or the LGUs consultant, as directed. By the close of business on the third business day after notification, the two lowest bidders, including a bidder who is a MBE, WBE or DBE, shall submit the following information:

- A. A Schedule of Participation (Form EEO-DEP-190). The <u>Schedule of Participation</u> shall list those certified DBEs the bidder intends to use in fulfilling the contract obligations, the nature of the work to be performed by each certified DBE subcontractor and the total price they are to be paid.
 - 1. A listing of bona-fide services such as a professional, technical, consultant or managerial services, assistance in the procurement of essential personnel, facilities, equipment, materials, or supplies required for performance of the contract, and reasonable fees or commissions charged.
 - 2. A listing of haulers, truckers, or delivery services, not the contractors, including reasonable fees for delivery of said materials or supplies to be included on the project.
- B. A Letter of Intent (Form EEO-DEP-191) for each DBE the bidder intends to use on the project. The Letter of Intent shall include, among other things, a reasonable description of the work the certified DBE is proposing to perform and the prices the certified DBE proposes to charge for the work. A Letter of Intent shall be jointly signed by the certified DBE and the General Contractor who proposes to use them in the performance of the Contract.
- C. Each DBE must also sign and return the DBE Certification of United States Citizenship form to verify that the firm is owned or controlled by a United States citizen.
- D. The SDO "DBE Certification" as prepared by each certified DBE.
- E. A completed Request for Waiver form and backup documentation should the goals not be achieved (See IV below).

IV. REQUIREMENTS FOR MODIFICATION OR WAIVERS.

The bidder shall make every possible effort to meet the minimum requirements of certified DBE participation. If the percentage of DBE participation submitted by the bidder on its Schedule of Participation (EEO-DEP-190) does not meet the minimum requirements, the bid may be rejected by the Awarding Authority and found not to be eligible for award of the contract.

In the event that the bidder is unable to meet the minimum requirements of DBE participation, the bidder shall submit with his/her submittal required in Section III. Requirement of Contract Award a Request for Waiver form (EEO-DEP-490). The Awarding Authority shall review the waiver request to determine if the request should proceed. If approved by the Awarding Authority, the Awarding Authority shall submit the waiver request and supporting documentation, with a recommendation to MassDEP within five days of receipt of the Request for Waiver. MassDEP in conjunction with the project manager, Compliance Unit, will determine whether the waiver will be granted.

The waiver request shall include detailed information as specified below to establish that the bidder has made a good faith effort to comply with the minimum requirements of DBE participation specified in Part I. In addition, the bidder must show that such efforts were undertaken well in advance of the time set for opening of bids to allow adequate response. A waiver request shall include the following:

- A. A detailed record of the effort made to contact and negotiate with the certified DBE, including, but not limited to:
 - 1. names, addresses and telephone numbers of all such companies contacted;
 - 2. copies of written notices(s) which were sent to certified DBE potential subcontractors, prior to bid opening;
 - 3. a detailed statement as to why each subcontractor contacted (i) was not willing to do the job or (ii) was not qualified to perform the work as solicited; and
 - 4. in the case(s) where a negotiated price could not be reached the bidder should detail what efforts were made to reach an agreement on a competitive price;
 - 5. copies of advertisements, dated not less than ten (10) days prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/ women-focused media detailing the opportunities for participation.
- B. MassDEP may require the bidder to produce such additional information as it deems appropriate.
- C. No later than fifteen (15) days after MassDEP receives all required information and documentation, it shall make a decision in writing, whether the waiver is granted and shall provide that determination to the bidder and Awarding Authority. If the waiver request is denied, the facts upon which a denial is based will be set forth in writing. If the waiver request is denied, the bid shall be rejected by the Awarding Authority, or the contract will be determined ineligible for SRF funding.

If a Request for Waiver is denied by MassDEP and the bid is rejected by the Awarding Authority, the Awarding Authority may then move to the second bidder on the project. At the Awarding Authority's discretion, it may collect a DBE package from the third bidder on the project.

V. <u>DISADVANTAGED BUSINESS ENTERPRISES PARTICIPATION</u>

A. Reporting Requirements

- 1. The Contractor's utilization of certified DBEs will be documented based upon submittal of the LGU's monthly Payment Requisitions as reported on Form-2000. The Form-2000 form will show all certified DBEs performing work on the project regardless of any billing activity for that month. For auditing and accounting purposes, the Contractor periodically may be required to submit copies of canceled checks verifying that payments have been made to the certified DBE as listed on the schedule. The Contractor may also be required to submit current schedules on utilization of all DBEs to indicate when their services will commence and be billed for.
- 2. During the life of the Contract, the Contractor's fulfillment of the percentage requirements in Part I shall be determined with reference to the Contract price as follows:
 - A. If the price in the Contract executed exceeds the base bid price (e.g., because an alternate was selected or because unit prices were used in awarding the Contract), the Contractor shall submit for approval by MassDEP a revised Schedule of Participation by certified DBEs satisfying the percentage requirements and such other information concerning additional DBE participation as may be requested by MassDEP.
 - B. If the Contract price increases after execution due to change orders or other adjustments, MassDEP may require the Contractor to subcontract additional work or to purchase additional goods and services from certified DBEs up to the percentages stated in Part I.

VI. COMPLIANCE

- A. If the Schedule or any of the Letters of Intent are materially incomplete or not submitted in a timely manner, the LGU may rescind its vote of award; treat the bid informal as to substance and reject the bid. If the bid is incomplete in any other respect than the Schedule the LGU with the approval of MassDEP may waive the informalities upon satisfactory completion of the required information by the Contractor and the certified DBE as applicable.
- B. If the LGU finds that the percentage of certified DBE participation submitted by the contractor on its Schedule does not meet the percentage requirement in Part I, it shall rescind its vote of award and find such contractor not to be eligible for award of the contract.

- C. The Contractor shall not perform with its own organization, or subcontract to any other primary or subcontractor any work designated for the named certified DBEs on the schedule submitted by the Contractor under Part III without the approval of MassDEP.
- D. A Contractor's compliance with the percentage requirement in Part I shall continue to be determined by reference to the required percentage of the total contract price as stated in Section I even though the total of actual contract payments may be greater or less than the bid price.
- E. If the Contractor for reasons beyond its control cannot comply with Part III in accordance with the Schedule submitted under Part III, Section B, the contractor must submit to MassDEP as soon as they are aware of the deficiency, the reason for its inability to comply. Proposed revisions to the Schedule stating how the contractor intends to meet its obligations under these conditions must be submitted within ten (10) working days of notification.
- F. If the Contractor is becomes aware by any means that that DBE is no longer certified, the Contractor shall immediately notify MassDEP. The Contractor shall use good faith efforts to retain a substitute certified DBE.
- G. If a certified DBE listed by the bidder in its Schedule of M/WBE contractors fails to obtain a performance or payment bond requested by the bidder, said failure shall not entitle the bidder to avoid the requirements of Part III (A). After a bidder has been awarded the contract, he shall not change the certified DBE listed in its Schedule at the time of the award or make any other such substitutions without the written approval of MassDEP.

VII. SANCTIONS

- A. If the Contractor does not comply with the terms of these Special Provisions, the Awarding Authority may (1) suspend any payment for the work that should have been performed by a certified DBE pursuant to the schedule, or (2) require specific performance of the Contractor's obligation by requiring the Contractor to subcontract with a DBE for any contract or specialty item at the contract price established for that item in the proposal submitted by the Contractor.
- B. To the extent that the Contractor has not complied with the terms of these Special Provisions, the Awarding Authority may retain in connection with Estimates and Payments an amount determined by multiplying the bid price of this contract by the percentage in Section I, less the amount paid to DBE's for work performed under the contract and any payments already suspended under VII A.
- C. The Awarding Authority may suspend, terminate or cancel this contract, in whole or in part, or may call upon the Contractor's surety to perform all terms and conditions in the contract, unless the contractor is able to demonstrate his compliance with the terms

- of these Special Provisions, and further deny to the Contractor, the right to participate in any future contracts awarded by the Awarding Authority for a period of up to three years.
- D. In any proceeding involving the imposition of sanctions by the Awarding Authority, no sanctions shall be imposed if the Awarding Authority finds that the contractor has taken every possible measure to comply with these Special Provisions or that some other justifiable reason exists for waiving these Special Provisions in whole or in part.
- E. The contract shall provide such information as is necessary in the judgment of the Awarding Authority to ascertain its compliance with the terms of these Special Provisions.
- F. A contractor shall have the right to request suspension of any sanctions imposed under this section upon demonstrating that he is in compliance with these Special Provisions.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF MUNICIPAL SERVICES

SCHEDULE OF PARTICIPATION FOR SRF CONSTRUCTION

Project Title:	Project Location:	
Disadvantaged Minority Business En	terprise Participation in the SRF Loan Work	
Name & Address of D/MB	E Nature of Participation	Dollar Value of Participation
1.		
2.		
3.		
Percentage D/MBE Participation = (Total D/MBE Commitment: Total D/MBE Commitment) / (Bid Price) =	\$ %
Disadvantaged Women Business Ento	erprise Participation in the SRF Loan Work	
Name & Address of D/WB	BE Nature of Participation	Dollar Value of Participation
1.	Nature of Farticipation	Тагистрацоп
2.		
3.		
	Total D/WBE Commitment:	\$
Percentage D/WBE Participation = (Total D/WBE Commitment) / (Bid Price) =	%
	ntation reports as required by MassDEP to indicate the sends to use. Breach of this commitment constitutes a	
Name of Bidder:		
Date: By:	Signature	
	Signature	
	counted in only their certified category; the same doll tage of D/MBE participation and again of D/WBE participation	
June 2012		EEO-DEP-190C

SRF FORMS 202 00800 Attachment 1B-1

LETTER OF INTENT FOR SRF CONSTRUCTION

This form is to be completed by the D/MBE and D/WBE and must be submitted by the Bidder as part of the bid. A separate form must be completed for each D/MBE and D/WBE involved in the project. Project Title: _____ Project Location: _____ TO: (Name of Bidder) FROM: (Please Indicate Status []D/MBE or []D/WBE) o I/we intend to perform work in connection with the above project as (check one): [] An individual [] A partnership [] A joint venture with: [] A corporation [] Other (explain): ^o It is understood that if you are awarded the contract, you intend to enter into an agreement to perform the activity described below for the prices indicated. DBE PARTICIPATION Date of Project % Description of Activity Commencement Bid Price \$ Amount

^o The undersigned certify that they will enter into a formal agreement upon execution of the contract for the above referenced project.

BIDDER		DBE	
(Authorized Original Signature)	Date	(Authorized Original Signature)	Date
ADDRESS:		ADDRESS:	
TELEPHONE #:		TELEPHONE #:	
FEIN:		FEIN:	

ORIGINALS:

- ^o Compliance Mgr. City/Town Project Location
- O DEP Program Manager for DEP's AAO Director
- * Attach a copy of current (within 2 years) DBE Certification

%

DBE CERTIFICATION OF UNITED STATES CITIZENSHIP

For the SRF program, under the EPA Disadvantage Business Enterprise (DBE) Rule, a DBE must be owned or controlled by a socially and economically disadvantaged person that is also a **citizen of the United States** (*See* 40 CFR 33.202). "Ownership" is defined at 13 CFR 124.105 and "control" is defined at 13 CFR 124.106.

DBEs are certified for the SRF program through the Supplier Diversity Office using the federal Department of Transportation (DOT) DBE rules. EPA allows the use of DBEs certified under the DOT rules as long as they are also United States citizens. To ensure compliance with the EPA rule, MassDEP must verify United States citizenship through the completion of the following form for each DBE used on the project.

SRF Project Number		
Contract Number		
Contract Title		
DBE Subcontractor		
	nalf of the above named DBE ed by a person or persons that	
Printed Name and Title	of DBE Signatory	
DBE Signature		
 Date		

DISADVANTABED BUSINESS ENTERPRISE PROGRAM DBE SUBCONTRACTOR PARTICIPATION FORM

The United States Environmental Protection Agency (EPA) requires that this form be provided to all subcontractors on the project. At the option of the subcontractor, this form may be filled out and submitted directly to the EPA DBE Coordinator.

NAME OF SU	BCONTRACTOR	PROJECT NAME	
ADDRESS		CONTRACT NO.	
TELEPHONE	NO.	E-MAIL ADDRESS	
PRIME CONT	RACTOR NAME:		
	space below to report any concerns regarding actor, late payment, etc.).	g the above EPA-funded proje	ect (e.g., reason for termination
CONTRACT	TTEM OF WORK OR DESCRIPTION OF	GENLIGES DECENTED	LAMOUNIT
CONTRACT ITEM NO.	ITEM OF WORK OR DESCRIPTION OF FROM THE PRIME CONTRACTOR	SERVICES RECEIVED	AMOUNT SUBCONTRACTOR WAS PAID BY PRIME CONTRACTOR
Subcontractor	Signature	Title/Date	

Equivalent to EPA form 6100-2

3.

REQUEST FOR WAIVER FOR SRF CONSTRUCTION

Upon exhausting all known sources and making every possible effort to meet the minimum requirements for DBE participation, the Bidder may seek relief either partially or entirely from these requirements by submitting a completed waiver package by the close of business on the third business day after notification by the LGU. Failure to comply with this process shall be cause to reject the bid thereby rendering the Bidder not eligible for award of the contract.

renderi	ng the B	idder not eligible for award of the contract.
<u>Genera</u>	ıl Inforn	nation_
Project	Title:	Project Location:
Bid Op	ening (tii	me/date)
Bidder:		
Mailing	g Address	S:
Contac	t Person:	Telephone No() Ext.
<u>Minim</u>	um Req	<u>uirements</u>
goals a advanc	s specifice of the	st demonstrate that good faith efforts were undertaken to comply with the percentage ied. The firm seeking relief must show that such efforts were taken appropriately in time set for opening bid proposals to allow adequate time for response(s) by following:
A.		led record of the effort made to contact and negotiate with disadvantaged minority woman owned businesses, including:
	1.	names, addresses, telephone numbers and contact dates of all such companies contacted;
	2.	copies of written notice(s) which were sent to DBE potential subcontractors prior to bid opening;

4. in the case(s) where a negotiated price could not be reached the bidder should detail what efforts were made to reach an agreement on a competitive price.

the job or (ii) was not qualified to perform the work as solicited; and

a detailed statement as to why each subcontractor contacted (i) was not willing to do

5. copies of advertisements, dated not less than ten (10) days prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/women-focused media detailing the opportunities for participation;

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- B. MassDEP may require the bidder to produce such additional information as it deems appropriate.
- C. No later than fifteen (15) days after submission of all required information and documentation, MassDEP shall make a determination, in writing, whether the waiver request is granted and shall provide that determination to the bidder and Awarding Authority. If the waiver request is denied, the facts upon which a denial is based will be set forth in writing.

CERTIFICATION

The undersigned herewith certifies that the above information and appropriate attachments are true and accurate to the best of my knowledge and that I have been authorized to act on behalf of the bidder in this matter.

	<u> </u>
(authorized original signature)	DATE

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SRF FORMS 2021 00800 Attachment 1B-6

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF MUNICIPAL SERVICES

STATE REVOLVING FUND LOAN PROGRAM – SCHEDULE OF SUBCONTRACTOR PARTICIPATION

Local Governmental	Unit		_						
Project Name			_						
SRF Identification N	umber		_						
General Contractor _			_						
Contract Value			_						
The United States En	vironmental Protection A	gency (EPA) requires	s that all SRF borrowers dev	elop and mainta	in a list of all MBE/WBE and non MB	E/WBE su	bcontrac	tors on th	ne project.
This form must be co	ompleted and returned to N	MassDEP within 90 da	lays of award of the contract						
contractor	Point of Contact	Mailing Address		Telephone Number	E-Mail Address	MBE	WBE	DBE	Subcontra

Subcontractor	Point of Contact	Mailing Address	Telephone Number	E-Mail Address	MBE	WBE	DBE	Subcontract Value

SRF FORMS 2021 00800 Attachment 1B-7

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

Prevailing Wage Rates

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: Springfield Water and Sewer Commission

Contract Number: SWSC Bid NO. 24-67 City/Town: SPRINGFIELD

Description of Work: Installation of 4000 sqft of ductile iron water pipe, associated excavation.

Job Location: Westford Circle and Liberty Street

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 annual update requirement is not applicable to 27F "rental of equipment" contracts. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- 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.

Issue Date: 04/08/2024 **Wage Request Number:** 20240408-016

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	01/01/2024	\$38.95	\$15.07	\$18.67	\$0.00	\$72.69
TELEBOOK COOKEENO. IV ZONED	06/01/2024	\$39.95	\$15.07	\$18.67	\$0.00	\$73.69
	12/01/2024	\$39.95	\$15.07	\$20.17	\$0.00	\$75.19
	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	01/01/2024	\$39.02	\$15.07	\$18.67	\$0.00	\$72.76
TEAMSTERS JOINT COONCIL NO. 10 ZONE B	06/01/2024	\$40.02	\$15.07	\$18.67	\$0.00	\$73.76
	12/01/2024	\$40.02	\$15.07	\$20.17	\$0.00	\$75.26
	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT	01/01/2024	\$39.14	\$15.07	\$18.67	\$0.00	\$72.88
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$40.14	\$15.07	\$18.67	\$0.00	\$73.88
	12/01/2024	\$40.14	\$15.07	\$20.17	\$0.00	\$75.38
	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice-PILE DRIVER"						
AIR TRACK OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.65	\$16.84	\$0.00	\$60.87
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2023	\$34.38	\$9.65	\$14.78	\$0.00	\$58.81
EDORANO - DORE S (ILEM I & INGHINI)	06/01/2024	\$35.58	\$9.65	\$14.78	\$0.00	\$60.01
	12/01/2024	\$36.78	\$9.65	\$14.78	\$0.00	\$61.21
	06/01/2025	\$38.03	\$9.65	\$14.78	\$0.00	\$62.46
	12/01/2025	\$39.27	\$9.65	\$14.78	\$0.00	\$63.70
	06/01/2026	\$40.57	\$9.65	\$14.78	\$0.00	\$65.00
	12/01/2026	\$41.86	\$9.65	\$14.78	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rat
ASBESTOS WORKER (PIPES & TANKS)	12/01/2023	\$36.72	\$14.50	\$10.55	\$0.00	\$61.77
HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)	06/01/2024	\$37.62	\$14.50	\$10.55	\$0.00	\$62.67
	12/01/2024	\$38.52	\$14.50	\$10.55	\$0.00	\$63.57
	06/01/2025	\$39.42	\$14.50	\$10.55	\$0.00	\$64.47
	12/01/2025	\$40.32	\$14.50	\$10.55	\$0.00	\$65.37
ASPHALT RAKER LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY)	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
_ABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.65	\$16.84	\$0.00	\$60.87
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY &	12/01/2023	\$34.38	\$9.65	\$14.78	\$0.00	\$58.81
HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.58	\$9.65	\$14.78	\$0.00	\$60.01
	12/01/2024	\$36.78	\$9.65	\$14.78	\$0.00	\$61.21
	06/01/2025	\$38.03	\$9.65	\$14.78	\$0.00	\$62.46
	12/01/2025	\$39.27	\$9.65	\$14.78	\$0.00	\$63.70
	06/01/2026	\$40.57	\$9.65	\$14.78	\$0.00	\$65.00
	12/01/2026	\$41.86	\$9.65	\$14.78	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
BOILER MAKER BOILERMAKERS LOCAL 29	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

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BOILERMAKERS LOCAL 29

Pension

Apprentice -	BOILERMAKER - Local	29
Effective Date	01/01/2024	

Step	ive Date - percent	01/01/2024	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65		\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65		\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70		\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75		\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80		\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85		\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90		\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95		\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY	02/01/2024	\$50.81	\$11.49	\$21.46	\$0.00	\$83.76
WATERPROOFING) BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	08/01/2024	\$52.06	\$11.49	\$21.46	\$0.00	\$85.01
	02/01/2025	\$53.36	\$11.49	\$21.46	\$0.00	\$86.31
	08/01/2025	\$55.51	\$11.49	\$21.46	\$0.00	\$88.46
	02/01/2026	\$56.86	\$11.49	\$21.46	\$0.00	\$89.81
	08/01/2026	\$59.06	\$11.49	\$21.46	\$0.00	\$92.01
	02/01/2027	\$60.46	\$11.49	\$21.46	\$0.00	\$93.41

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Total Rate

Apprentice Base Wage Health

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield

02/01/2024

Effective Date -

percent

Step

Pension

Supplemental Unemployment

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
LABORERS - FOUNDATION AND MARINE	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
For apprentice rates see "Apprentice- LABORER"	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
CARBIDE CORE DRILL OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
CARPENTER	03/01/2024	\$41.41	\$7.91	\$18.15	\$0.00	\$67.47
CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN	09/01/2024	\$42.36	\$7.91	\$18.15	\$0.00	\$68.42
	03/01/2025	\$43.26	\$7.91	\$18.15	\$0.00	\$69.32
	09/01/2025	\$44.21	\$7.91	\$18.15	\$0.00	\$70.27
	03/01/2026	\$45.11	\$7.91	\$18.15	\$0.00	\$71.17
	09/01/2026	\$46.06	\$7.91	\$18.15	\$0.00	\$72.12
	03/01/2027	\$46.96	\$7.91	\$18.15	\$0.00	\$73.02

Apprentice - CARPENTER - Local 336 Hampden Hampshire Franklin

Effect	ive Date -	03/01/2024	1 1				
Step	percent	03,01,2021	Apprentice Base Wag	e Health	Pension	Supplemental Unemployment	Total Rate
1	45		\$18.63	\$7.91	\$1.40	\$0.00	\$27.94
2	45		\$18.63	\$7.91	\$1.40	\$0.00	\$27.94
3	55		\$22.78	\$7.91	\$2.76	\$0.00	\$33.45
4	55		\$22.78	\$7.91	\$2.76	\$0.00	\$33.45
5	70		\$28.99	\$7.91	\$15.39	\$0.00	\$52.29
6	70		\$28.99	\$7.91	\$15.39	\$0.00	\$52.29
7	80		\$33.13	\$7.91	\$16.77	\$0.00	\$57.81
8	80		\$33.13	\$7.91	\$16.77	\$0.00	\$57.81
Effect	ive Date -	09/01/2024				Supplemental	
Step	percent		Apprentice Base Wag	e Health	Pension	Unemployment	Total Rate
1	45		\$19.06	\$7.91	\$1.40	\$0.00	\$28.37
2	45		\$19.06	\$7.91	\$1.40	\$0.00	\$28.37
3	55		\$23.30	\$7.91	\$2.76	\$0.00	\$33.97
4	55		\$23.30	\$7.91	\$2.76	\$0.00	\$33.97
			\$29.65	\$7.91	\$15.39	\$0.00	\$52.95
5	70		Φ25.03	ψ7.51	Ψ.υ.υ,		
5 6	70 70		\$29.65	\$7.91	\$15.39	\$0.00	\$52.95
6	70		\$29.65	\$7.91	\$15.39	\$0.00	\$58.57
6 7	70 80 80		\$29.65 \$33.89	\$7.91 \$7.91	\$15.39 \$16.77	\$0.00 \$0.00	\$52.95 \$58.57 \$58.57

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	10/01/2023	\$25.55	\$7.02	\$4.80	\$0.00	\$37.37
CARPENTERS-ZONE 3 (Wood Frame)	10/01/2024	\$26.65	\$7.02	\$4.80	\$0.00	\$38.47
	10/01/2025	\$27.75	\$7.02	\$4.80	\$0.00	\$39.57
	10/01/2026	\$28.85	\$7.02	\$4.80	\$0.00	\$40.67
All Aspects of New Wood Frame Work						

Apprentice -	CARPENTER	(Wood Frame)	- Zone 3
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Effect	ive Date -	10/01/2023				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	60		\$15.33	\$7.02	\$0.00	\$0.00	\$22.35
2	60		\$15.33	\$7.02	\$0.00	\$0.00	\$22.35
3	65		\$16.61	\$7.02	\$1.00	\$0.00	\$24.63
4	70		\$17.89	\$7.02	\$1.00	\$0.00	\$25.91
5	75		\$19.16	\$7.02	\$4.80	\$0.00	\$30.98
6	80		\$20.44	\$7.02	\$4.80	\$0.00	\$32.26
7	85		\$21.72	\$7.02	\$4.80	\$0.00	\$33.54
8	90		\$23.00	\$7.02	\$4.80	\$0.00	\$34.82
Effect	ive Date -	10/01/2024				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	60		\$15.00	\$7.02	00.02	90.00	\$23.01

Step	percent	Apprentice Base Wag	ge Health	Pension	Unemployment	Total Rate
1	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
2	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
3	65	\$17.32	\$7.02	\$1.00	\$0.00	\$25.34
4	70	\$18.66	\$7.02	\$1.00	\$0.00	\$26.68
5	75	\$19.99	\$7.02	\$4.80	\$0.00	\$31.81
6	80	\$21.32	\$7.02	\$4.80	\$0.00	\$33.14
7	85	\$22.65	\$7.02	\$4.80	\$0.00	\$34.47
8	90	\$23.99	\$7.02	\$4.80	\$0.00	\$35.81

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80 Step 1&2 \$18.52/ 3&4 \$21.07/ 5&6 \$28.70/ 7&8 \$31.26

Apprentice to Journeyworker Ratio:1:5

 CEMENT MASONRY/PLASTERING
 01/01/2024
 \$44.68
 \$12.90
 \$18.66
 \$1.25
 \$77.49

 BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)
 \$44.68
 \$12.90
 \$18.66
 \$1.25
 \$77.49

Issue Date: 04/08/2024 **Wage Request Number:** 20240408-016 **Page 7 of 34**

	Apprei	itice - <i>Cl</i> ve Date -	EMENT MASONRY/PLAST 01/01/2024	ERING - Springfield/Pitts	field				
	Step	percent	01/01/2024	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate)
	1	50		\$22.34	\$12.90	\$15.86	\$0.00	\$51.10)
	2	60		\$26.81	\$12.90	\$18.66	\$1.25	\$59.62	2
	3	65		\$29.04	\$12.90	\$18.66	\$1.25	\$61.85	5
	4	70		\$31.28	\$12.90	\$18.66	\$1.25	\$64.09)
	5	75		\$33.51	\$12.90	\$18.66	\$1.25	\$66.32	2
	6	80		\$35.74	\$12.90	\$18.66	\$1.25	\$68.55	5
	7	90		\$40.21	\$12.90	\$18.66	\$1.25	\$73.02	2
	Notes:		are 500 hrs. All other steps	s are 1,000 hrs.					
CHAIN SAW (OPERAT E 3 (BUILL	OR DING & SITE))	12/01/202	3 \$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice COMPRESSOI OPERATING ENGINEERS For apprentice	R OPERA	ATOR OCAL 98	DPERATING ENGINEERS"	12/01/202.	3 \$39.03	\$13.38	\$15.15	\$0.00	\$67.56
CRANE OPER	ATOR			12/01/202	3 \$43.06	\$13.78	\$15.15	\$0.00	\$71.99
For apprentice	rates see "	Apprentice- C	PERATING ENGINEERS"						
DELEADER (E		•		01/01/2024	4 \$56.06	\$9.95	\$23.95	\$0.00	\$89.96
PAINTERS LOCAL tse	SS - ZONE	. 3		07/01/202	4 \$57.26	\$9.95	\$23.95	\$0.00	\$91.16
Ľ				01/01/202	5 \$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Issue Date: 04/08/2024 Wage Request Number: 20240408-016 **Page 8 of 34** **Apprentice -** PAINTER Local 35 - BRIDGES/TANKS

	Step	percent					Supplemental		
		percent	Apprentice	Base Wage	Health	Pension	Unemployment	Total Rate	e
	1	50	\$	528.03	\$9.95	\$0.00	\$0.00	\$37.98	3
	2	55	\$	30.83	\$9.95	\$6.66	\$0.00	\$47.44	1
	3	60	\$	33.64	\$9.95	\$7.26	\$0.00	\$50.85	5
	4	65	\$	36.44	\$9.95	\$7.87	\$0.00	\$54.26	5
	5	70	\$	39.24	\$9.95	\$20.32	\$0.00	\$69.51	ĺ
	6	75	\$	342.05	\$9.95	\$20.93	\$0.00	\$72.93	3
	7	80	\$	344.85	\$9.95	\$21.53	\$0.00	\$76.33	3
	8	90	\$	550.45	\$9.95	\$22.74	\$0.00	\$83.14	1
	Effecti	ve Date - 07/01/2024					Supplemental		
	Step	percent	Apprentice	Base Wage	Health	Pension	Unemployment	Total Rate	e
	1	50	\$	528.63	\$9.95	\$0.00	\$0.00	\$38.58	3
	2	55	\$	31.49	\$9.95	\$6.66	\$0.00	\$48.10)
	3	60		334.36	\$9.95	\$7.26	\$0.00	\$51.57	
	4	65		337.22	\$9.95	\$7.87	\$0.00	\$55.04	
	5	70	\$	340.08	\$9.95	\$20.32	\$0.00	\$70.35	
	6	75		342.95	\$9.95	\$20.93	\$0.00	\$73.83	
	7	80		345.81	\$9.95	\$21.53	\$0.00	\$77.29	
	8	90		551.53	\$9.95	\$22.74	\$0.00	\$84.22	
	Notes:								
		Steps are 750 hrs.						į	
	Appre	ntice to Journeyworker	Ratio:1:1						
DEMO: ADZEN		DING & SITE)		12/01/2023	\$44.98	\$9.40	\$17.82	\$0.00	\$72.20
		Apprentice- LABORER"							
	HOE/LO	DADER/HAMMER OPI	ERATOR	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
		Apprentice- LABORER"							
DEMO: BURNI		DING & SITE)		12/01/2023	\$45.73	\$9.40	\$17.82	\$0.00	\$72.95
		Apprentice- LABORER"							
DEMO: CONCI		UTTER/SAWYER DING & SITE)		12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
For apprentice	rates see "	Apprentice- LABORER"							
DEMO: JACKE				12/01/2023	\$45.73	\$9.40	\$17.82	\$0.00	\$72.95
		Apprentice- LABORER"							
DEMO: WREC				12/01/2023	\$44.98	\$9.40	\$17.82	\$0.00	\$72.20
		Apprentice- LABORER"							
DIVER PILE DRIVER LOCA	AL 56 (Z C	NE 3)		08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
Issue Date: 0	4/08/202	24	Wage Request Number:	2024040	08-016				Page 9 of 34

Classification

For apprentice	e rates see "A	Apprentice- PILE DRIVER"					Unemployment	
DIVER TENDI PILE DRIVER LOC		VE 3)	08/01/202	0 \$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice	e rates see "A	Apprentice- PILE DRIVER"						
DIVER TENDI Pile driver loc		,	08/01/202	0 \$73.60	\$9.40	\$23.12	\$0.00	\$106.12
		Apprentice- PILE DRIVER"						
DIVER/SLURF Pile Driver loc	,	The state of the s	08/01/2020	0 \$103.0	5 \$9.40	\$23.12	\$0.00	\$135.57
For apprentice	e rates see "A	Apprentice- PILE DRIVER"						
ORAWBRIDG Drawbridge - Si		TOR (Construction) 888	07/01/202	0 \$26.77	\$6.67	\$3.93	\$0.16	\$37.53
		ng Core Drilling)	12/31/202	3 \$49.01	\$12.75	\$14.61	\$0.00	\$76.37
ELECTRICIANS LO	OCAL /		06/30/202	4 \$50.01	\$13.00	\$14.86	\$0.00	\$77.87
			12/29/202	4 \$51.06	\$13.25	\$15.06	\$0.00	\$79.37
			06/29/202	5 \$52.16	\$13.50	\$15.21	\$0.00	\$80.87
			12/28/202	5 \$53.26	\$13.75	\$15.36	\$0.00	\$82.37
			06/28/202	6 \$54.41	\$14.00	\$15.46	\$0.00	\$83.87
			01/03/202	7 \$55.56	\$14.25	\$15.56	\$0.00	\$85.37
	A	tice - ELECTRICIAN - Locai	17					
	Appren Effective Step	e Date - 12/31/2023 percent	Apprentice Base Wage	Health	Pension	Supplementa Unemploymen		
	Effectiv	re Date - 12/31/2023	Apprentice Base Wage \$19.60	Health \$7.65	Pension \$0.59	• •	t Total Rate	
	Effective Step	e Date - 12/31/2023 percent				Unemploymen	Total Rate S27.84	
	Effective Step	e Date - 12/31/2023 percent 40	\$19.60	\$7.65	\$0.59	Unemploymen \$0.00	Total Rate 3 \$27.84 3 \$30.36	
	Step 1 2	e Date - 12/31/2023 percent 40 45	\$19.60 \$22.05	\$7.65 \$7.65	\$0.59 \$0.66	\$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60	
	Step 1 2 3	e Date - 12/31/2023 percent 40 45 50	\$19.60 \$22.05 \$24.51	\$7.65 \$7.65 \$12.75	\$0.59 \$0.66 \$7.34	\$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12	
	Step 1 2 3 4	e Date - 12/31/2023 percent 40 45 50 55	\$19.60 \$22.05 \$24.51 \$26.96	\$7.65 \$7.65 \$12.75 \$12.75	\$0.59 \$0.66 \$7.34 \$7.41	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13	
	Effective Step 1 2 3 4 5	e Date - 12/31/2023 percent 40 45 50 55 65	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52	\$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96	
	Effective Step 1 2 3 4 5 6 Effective Step	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate D \$27.84 D \$30.36 D \$44.60 D \$47.12 D \$54.13 D \$57.96	
	Effective Step 1 2 3 4 5 6 Effective Step 1	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90	\$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96	
	Effective Step 1 2 3 4 5 6 Effective Step 1 2	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90	Supplementa Unemploymen	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40	
	Effective Step 1 2 3 4 5 6 Effective Step 1	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 Health	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60	\$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98	
	Effective Step 1 2 3 4 5 6 Effective Step 1 2	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68	\$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98 0 \$45.41	
	Effective Step 1 2 3 4 5 6 Effective Step 1 2 3 3	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40	Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 Supplementa Unemploymen \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98 0 \$47.99	
	Effective Step 1 2 3 4 5 6 Effective Step 1 2 3 4 4 4	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50 55	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01 \$27.51	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80 \$13.00 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40 \$7.48	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98 0 \$45.41 0 \$47.99 0 \$55.15	
	Effective Step	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50 55 65	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01 \$27.51 \$32.51 \$35.01	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80 \$13.00 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40 \$7.48 \$9.64	Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 Supplementa Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98 0 \$45.41 0 \$47.99 0 \$55.15	
	Effective Step	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50 55 65 70	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01 \$27.51 \$32.51 \$35.01	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80 \$13.00 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40 \$7.48 \$9.64	Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 Supplementa Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98 0 \$45.41 0 \$47.99 0 \$55.15	
	Effectiv Step 1 2 3 4 5 6 Effectiv Step 1 2 3 4 5 6 Notes: Appren	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50 55 65 70 Steps 1-2 are 1000 hrs; Steps 3 tice to Journeyworker Ratio:	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01 \$27.51 \$32.51 \$35.01	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80 \$13.00 \$13.00 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40 \$7.48 \$9.64 \$11.06	Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 Supplementa Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 Total Rate 0 \$28.40 0 \$30.98 0 \$45.41 0 \$47.99 0 \$55.15	
	Effectiv Step 1 2 3 4 5 6 Effectiv Step 1 2 3 4 5 6 Notes: Appren	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50 55 65 70 Steps 1-2 are 1000 hrs; Steps 3 tice to Journeyworker Ratio:	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01 \$27.51 \$32.51 \$35.01	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 \$13.00 \$13.00 \$13.00 \$13.00 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40 \$7.48 \$9.64 \$11.06	Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 Supplementa Unemploymen \$0.00 \$0.00 \$0.00 \$0.00	Total Rate S27.84	\$99.12
ELEVATOR CO	Effectiv Step 1 2 3 4 5 6 Effectiv Step 1 2 3 4 5 6 Notes: Appren	e Date - 12/31/2023 percent 40 45 50 55 65 70 e Date - 06/30/2024 percent 40 45 50 55 65 70 Steps 1-2 are 1000 hrs; Steps 3 tice to Journeyworker Ratio:	\$19.60 \$22.05 \$24.51 \$26.96 \$31.86 \$34.31 Apprentice Base Wage \$20.00 \$22.50 \$25.01 \$27.51 \$32.51 \$35.01 3-6 are 1500 hrs. 2:3**** 01/01/202	\$7.65 \$7.65 \$12.75 \$12.75 \$12.75 \$12.75 \$12.75 Health \$7.80 \$7.80 \$13.00 \$13.00 \$13.00 \$13.00 \$13.00	\$0.59 \$0.66 \$7.34 \$7.41 \$9.52 \$10.90 Pension \$0.60 \$0.68 \$7.40 \$7.48 \$9.64 \$11.06	Unemploymen \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total Rate 0 \$27.84 0 \$30.36 0 \$44.60 0 \$47.12 0 \$54.13 0 \$57.96 1 Total Rate 0 \$28.40 0 \$30.98 0 \$47.41 0 \$55.15 0 \$59.07	

Effective Date Base Wage Health

Supplemental

Pension

Total Rate

 Issue Date:
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Apprentice - ELEVATOR CONSTRUCTOR - Local 41

Effective Date - 01/01/2024

Pension

Supplemental

Total Rate

	C4		A	TT 141-	D	Supplemental	T-4-1 D-4-	
	Step	percent	Apprentice Base Wage		Pension	Unemployment	Total Rate	
	1	50	\$30.99	\$16.18	\$0.00	\$0.00	\$47.17	
	2	55	\$34.09	\$16.18	\$20.96	\$0.00	\$71.23	
	3	65	\$40.29	\$16.18	\$20.96	\$0.00	\$77.43	
	4	70	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53	
	5	80	\$49.58	\$16.18	\$20.96	\$0.00	\$86.72	
	Effecti	ve Date - 01/01/2025				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50	\$31.42	\$16.28	\$0.00	\$0.00	\$47.70	
	2	55	\$34.56	\$16.28	\$21.36	\$0.00	\$72.20	
	3	65	\$40.84	\$16.28	\$21.36	\$0.00	\$78.48	
	4	70	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62	
	5	80	\$50.26	\$16.28	\$21.36	\$0.00	\$87.90	
	Notes:							
		Steps 1-2 are 6 mos.; Steps 3-5 are 1	year					
	Appre	ntice to Journeyworker Ratio:1:1						
ELEVATOR CO		JCTOR HELPER	01/01/2024	4 \$43.3	9 \$16.18	\$20.96	\$0.00	\$80.53
ELEVATOR CONSTI			01/01/2025			\$20.36	\$0.00	\$81.62
						\$21.76	\$0.00	
			01/01/2020 01/01/202			\$21.76	\$0.00	\$82.72 \$83.81
For apprentice i	rates see "	Apprentice - ELEVATOR CONSTRUCTOR"	01/01/202	7 \$45.1	7 \$16.48	\$22.10	\$0.00	\$05.01
FENCE & GUA	RD RA	IL ERECTOR (HEAVY & HIGHWA	Y) 12/01/2023	3 \$33.8	88 \$9.65	\$14.78	\$0.00	\$58.31
LABORERS - ZONE	3 (HEAV	Y & HIGHWAY)	06/01/2024			\$14.78	\$0.00	\$59.51
			12/01/202			\$14.78	\$0.00	\$60.71
			06/01/202:			\$14.78	\$0.00	\$61.96
			12/01/202:			\$14.78	\$0.00	\$63.20
			06/01/2020			\$14.78	\$0.00	\$64.50
			12/01/2020			\$14.78	\$0.00	\$65.79
For apprentice i	rates see "	Apprentice- LABORER (Heavy and Highway)		4	4			4.21/.
FIELD ENG.INS OPERATING ENGIN		D-BLDG,SITE,HVY/HWY DCAL 98	06/01/1999	9 \$18.8	\$4.80	\$4.10	\$0.00	\$27.74
FIELD ENG.PA		HIEF:BLDG,SITE,HVY/HWY OCAL 98	06/01/1999	9 \$21.3	33 \$4.80	\$4.10	\$0.00	\$30.23
FIELD ENG.SU	RVEY	CHIEF-BLDG,SITE,HVY/HWY	06/01/1999	9 \$22.3	33 \$4.80	\$4.10	\$0.00	\$31.23

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM INSTALLER	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
ELECTRICIANS LOCAL 7	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
For apprentice rates see "Apprentice- ELECTRICIAN"	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
FIRE ALARM REPAIR / MAINTENANCE	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
/ COMMISSIONING <i>electricians</i> local 7	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
500/IL/	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
For apprentice rates see "Apprentice-TELECOMMUNICATIONS TECHNICIAN"	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
FIREMAN OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56

	Effect	ive Date - 12/01/2023				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total l	Rate
	1	60	\$23.42	\$13.38	\$15.15	\$0.00	\$5	1.95
	2	70	\$27.32	\$13.38	\$15.15	\$0.00	\$5:	5.85
	3	80	\$31.22	\$13.38	\$15.15	\$0.00	\$59	9.75
	4	90	\$35.13	\$13.38	\$15.15	\$0.00	\$63	3.66
	Notes		. – – – – – –					_
		Steps 1-2 are 1000 hrs.; Steps 3-	4 are 2000 hrs.					
	Appre	entice to Journeyworker Ratio:1:	6					_
FLAGGER & SIGNALER (HEAVY & HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)		12/01/2023	\$25.48	\$9.65	\$14.66	\$0.00	\$49.79	
		06/01/2024	\$26.51	\$9.65	\$14.66	\$0.00	\$50.82	
		12/01/2024	\$26.51	\$9.65	\$14.66	\$0.00	\$50.82	
			06/01/2025	\$27.59	\$9.65	\$14.66	\$0.00	\$51.90
			12/01/2025	\$27.59	\$9.65	\$14.66	\$0.00	\$51.90
			06/01/2026	\$28.71	\$9.65	\$14.66	\$0.00	\$53.02
			12/01/2026	\$28.71	\$9.65	\$14.66	\$0.00	\$53.02
		"Apprentice- LABORER (Heavy and High	way)					
LOORCOVI Loorcovere		2168 ZONE III	03/01/2024	\$41.41	\$7.91	\$18.15	\$0.00	\$67.47
Bookeo, Bib	20 0		09/01/2024	\$42.36	\$7.91	\$18.15	\$0.00	\$68.42
			03/01/2025	\$43.26	\$7.91	\$18.15	\$0.00	\$69.32
			09/01/2025	\$44.21	\$7.91	\$18.15	\$0.00	\$70.27
			03/01/2026	\$45.11	\$7.91	\$18.15	\$0.00	\$71.17
			09/01/2026	\$46.06	\$7.91	\$18.15	\$0.00	\$72.12
			03/01/2027	\$46.96	\$7.91	\$18.15	\$0.00	\$73.02

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Step	ive Date - percent	03/01/2024 Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$20.71	\$7.31	\$1.38	\$0.00	\$29.40	
2	55	\$22.78	\$7.31	\$1.38	\$0.00	\$31.47	
3	60	\$24.85	\$7.31	\$2.76	\$0.00	\$34.92	
4	65	\$26.92	\$7.31	\$2.76	\$0.00	\$36.99	
5	70	\$28.99	\$7.31	\$15.39	\$0.00	\$51.69	
6	75	\$31.06	\$7.31	\$15.39	\$0.00	\$53.76	
7	80	\$33.13	\$7.31	\$16.77	\$0.00	\$57.21	
8	85	\$35.20	\$7.31	\$16.77	\$0.00	\$59.28	
	ive Date -	09/01/2024	TT 1.1	ъ.	Supplemental	T (1 D)	
Step	percent	Apprentice Base Wage		Pension	Unemployment	Total Rate	
1	50	\$21.18	\$7.31	\$1.38	\$0.00	\$29.87	
2	55	\$23.30	\$7.31	\$1.38	\$0.00	\$31.99	
3	60	\$25.42	\$7.31	\$2.76	\$0.00	\$35.49	
4	65	\$27.53	\$7.31	\$2.76	\$0.00	\$37.60	
5	70	\$29.65	\$7.31	\$15.39	\$0.00	\$52.35	
5	75	\$31.77	\$7.31	\$15.39	\$0.00	\$54.47	
7	80	\$33.89	\$7.31	\$16.77	\$0.00	\$57.97	
8	85	\$36.01	\$7.31	\$16.77	\$0.00	\$60.09	
Notes:		50 hrs. 0/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps) \$26.72.24/ 3&4 \$32.11/ 5&6 \$50.75/ 7&8 \$56.14					
Annea		ırneyworker Ratio:1:1					
Appre							

FORK LIFT OPERATING ENG For apprentice GENERATORS/LIGHTING PLANTS 12/01/2023 \$15.15 \$0.00 \$35.80 \$13.78 \$64.73 OPERATING ENGINEERS LOCAL 98 For apprentice rates see "Apprentice-OPERATING ENGINEERS" GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR 06/01/2020 \$39.18 \$10.80 \$10.45 \$0.00 \$60.43 SYSTEMS)

GLAZIERS LOCAL 1333

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	Step	percent 06/01/2020	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total 1	Rate
	1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$3	2.19
	2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$3	4.64
	3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$3	7.74
	4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$4	0.19
	5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$4	3.34
	6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$4	5.78
	7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$5	5.53
	8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57	7.98
	Notes:						- — — –	-
	Appre	ntice to Journeyworker R	atio:1:3					. Ј
RADER/TI		G MACHINE/DERRICK	12/01/202	3 \$39.56	\$13.78	\$15.15	\$0.00	\$68.49
		'Apprentice- OPERATING ENGIN	NEERS"					
For apprentice rates see "Appred" HVAC (DUCTWORK)			01/01/202	4 \$40.22	\$11.96	\$18.74	\$2.13	\$73.0:
HEETMETAL)	VORKERS LO	OCAL 63	07/01/202	4 \$41.47	\$11.96	\$18.74	\$2.13	\$74.30
For anyon	tiaa wataa aa l	'Apprentice- SHEET METAL WO	01/01/202	5 \$42.72	\$11.96	\$18.74	\$2.13	\$75.5
		CONTROLS)	12/31/202	3 \$49.01	\$12.75	\$14.61	\$0.00	\$76.3
LECTRICIANS		25,	06/30/202		\$13.00	\$14.86	\$0.00	\$70.3 \$77.8
			12/29/202			\$15.06	\$0.00	\$77.8 \$79.3
			06/29/202			\$15.00	\$0.00	\$80.8
			12/28/202			\$15.21	\$0.00	\$82.3
			06/28/202		\$14.00	\$15.46	\$0.00	\$83.8
			01/03/202			\$15.56	\$0.00	\$85.3
For appren	tice rates see '	'Apprentice- ELECTRICIAN"	01/03/202	, 455.50	Ψ17.23	Q10.00	20.00	φυσ.5
`		BALANCING - AIR)	01/01/202	4 \$40.22	\$11.96	\$18.74	\$2.13	\$73.0:
HEETMETAL V	WORKERS LO	OC.4L 63	07/01/202	4 \$41.47	\$11.96	\$18.74	\$2.13	\$74.30
			01/01/202	5 \$42.72	\$11.96	\$18.74	\$2.13	\$75.5
		'Apprentice- SHEET METAL WO	RKER"					
VAC (TES' Lumbers & 1		D BALANCING -WATER) 5 LOCAL 104	03/17/202	4 \$49.21	\$9.55	\$17.10	\$0.00	\$75.80
For apprent	tice rates see '	'Apprentice- PIPEFITTER" or "PI	UMBER/PIPEFITTER"					
VAC MEC		S LOCAL 104	03/17/202	4 \$49.21	\$9.55	\$17.10	\$0.00	\$75.86

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS (HEAVY & HIGHWAY)	12/01/2023	\$34.38	\$9.65	\$14.78	\$0.00	\$58.81
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.58	\$9.65	\$14.78	\$0.00	\$60.01
	12/01/2024	\$36.78	\$9.65	\$14.78	\$0.00	\$61.21
	06/01/2025	\$38.03	\$9.65	\$14.78	\$0.00	\$62.46
	12/01/2025	\$39.27	\$9.65	\$14.78	\$0.00	\$63.70
	06/01/2026	\$40.57	\$9.65	\$14.78	\$0.00	\$65.00
	12/01/2026	\$41.86	\$9.65	\$14.78	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
INSULATOR (PIPES & TANKS)	09/01/2023	\$42.80	\$14.75	\$19.61	\$0.00	\$77.16
HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)	09/01/2024	\$45.54	\$14.75	\$19.61	\$0.00	\$79.90
	09/01/2025	\$48.27	\$14.75	\$19.61	\$0.00	\$82.63
	09/01/2026	\$51.01	\$14.75	\$19.61	\$0.00	\$85.37

Apprentice -	ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield
Effective Date	- 09/01/2023

Effec	ctive Date - 09/01/2023				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50	\$21.40	\$14.75	\$14.32	\$0.00	\$50.47
2	60	\$25.68	\$14.75	\$15.37	\$0.00	\$55.80
3	70	\$29.96	\$14.75	\$16.43	\$0.00	\$61.14
4	80	\$34.24	\$14.75	\$17.49	\$0.00	\$66.48
Effec	etive Date - 09/01/2024				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50	\$22.77	\$14.75	\$14.32	\$0.00	\$51.84
2	60	\$27.32	\$14.75	\$15.37	\$0.00	\$57.44
3	70	\$31.88	\$14.75	\$16.43	\$0.00	\$63.06
4	80	\$36.43	\$14.75	\$17.49	\$0.00	\$68.67
Note	s:					
	Steps are 1 year					
App	rentice to Journeyworker Ratio:	1:4				
IRONWORKER/WEI		03/16/2024	1 \$40	.66 \$8.25	\$22.70	\$0.00 \$71.61

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Pension

\$0.00

\$0.00

\$53.29

\$56.64

3

4

Notes:

80

90

Step	ive Date - 03/16/2024 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	60	\$24.40	\$8.25	\$22.70	\$0.00	\$55.35	
2	70	\$28.46	\$8.25	\$22.70	\$0.00	\$59.41	
3	75	\$30.50	\$8.25	\$22.70	\$0.00	\$61.45	
4	80	\$32.53	\$8.25	\$22.70	\$0.00	\$63.48	
5	85	\$34.56	\$8.25	\$22.70	\$0.00	\$65.51	
6	90	\$36.59	\$8.25	\$22.70	\$0.00	\$67.54	
Notes							
Appro	entice to Journeyworker Ratio:1:4						
MMER & PA - ZONE 3 (BUIL	VING BREAKER OPERATOR DING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.3
prentice rates see	"Apprentice- LABORER"						
R - ZONE 3 (BUIL	DING & SITE)	12/01/2023	\$33.50	\$9.65	\$16.84	\$0.00	\$59.9
Appre	ntice - LABORER - Zone 3 Buildin ive Date - 12/01/2023			D	Supplemental	Total Rate	
Effect Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	percent 60	Apprentice Base Wage \$20.10	######################################	\$16.84	\$0.00	\$46.59	

l						
Apprentice to Journeyworker Ratio:1:5						_
LABORER (HEAVY & HIGHWAY)	12/01/2023	\$33.63	\$9.65	\$14.78	\$0.00	\$58.06
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$34.83	\$9.65	\$14.78	\$0.00	\$59.26
	12/01/2024	\$36.03	\$9.65	\$14.78	\$0.00	\$60.46
	06/01/2025	\$37.28	\$9.65	\$14.78	\$0.00	\$61.71
	12/01/2025	\$38.52	\$9.65	\$14.78	\$0.00	\$62.95
	06/01/2026	\$39.82	\$9.65	\$14.78	\$0.00	\$64.25
	12/01/2026	\$41.11	\$9.65	\$14.78	\$0.00	\$65.54

\$26.80

\$30.15

\$9.65

\$9.65

\$16.84

\$16.84

Issue Date: 04/08/2024 Wage Request Number: 20240408-016 Page 16 of 34 Apprentice - LABORER (Heavy & Highway) - Zone 3

12/01/2023

Effective Date -

percent

Step

Issue Date: 04/08/2024

Pension

Supplemental

Unemployment

Total Rate

Total Rate

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Apprentice Base Wage Health

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
MARBLE & TILE FINISHERS	02/01/2024	\$41.37	\$11.49	\$20.53	\$0.00	\$73.39
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	08/01/2024	\$43.05	\$11.49	\$20.53	\$0.00	\$75.07
	02/01/2025	\$44.90	\$11.49	\$20.53	\$0.00	\$76.92
	08/01/2025	\$45.81	\$11.49	\$20.53	\$0.00	\$77.83
	02/01/2026	\$46.89	\$11.49	\$20.53	\$0.00	\$78.91
	08/01/2026	\$48.65	\$11.49	\$20.53	\$0.00	\$80.67
	02/01/2027	\$49.77	\$11.49	\$20.53	\$0.00	\$81.79

Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)

Effective Date -		02/01/2024				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50		\$20.69	\$11.49	\$20.53	\$0.00	\$52.71
2	60		\$24.82	\$11.49	\$20.53	\$0.00	\$56.84
3	70		\$28.96	\$11.49	\$20.53	\$0.00	\$60.98
4	80		\$33.10	\$11.49	\$20.53	\$0.00	\$65.12
5	90		\$37.23	\$11.49	\$20.53	\$0.00	\$69.25
Effect	ive Date -	08/01/2024				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50		\$21.53	\$11.49	\$20.53	\$0.00	\$53.55
2	60		\$25.83	\$11.49	\$20.53	\$0.00	\$57.85
3	70		\$30.14	\$11.49	\$20.53	\$0.00	\$62.16
4	80		\$34.44	\$11.49	\$20.53	\$0.00	\$66.46
5	90		\$38.75	\$11.49	\$20.53	\$0.00	\$70.77
Notes:							
1							
Appre	entice to Jo	urneyworker Ratio:1:5					

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick

Effective Date - 02/01/2024

BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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Total Rate

\$72.50

\$74.78

\$77.06

-	
Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension,	
but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)	
Steps are 2,000 hours	

Apprentice to Journeyworker Ratio:1:4

55

65

75

85

2

3

4

<u></u>						
MORTAR MIXER LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
OILER OPERATING ENGINEERS LOCAL 98	12/01/2023	\$35.02	\$13.78	\$15.15	\$0.00	\$63.95
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI OPERATING ENGINEERS LOCAL 98	12/01/2023	\$32.74	\$13.78	\$15.15	\$0.00	\$61.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 3	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
FAINTERS LOCAL 33 - ZONE 3	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

\$23.91

\$28.26

\$32.61

\$36.96

\$10.08

\$10.08

\$10.08

\$10.08

\$5.36

\$6.34

\$18.78

\$19.76

\$0.00

\$0.00

\$0.00

\$0.00

\$39.35

\$44.68

\$61.47

\$66.80

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Last Modified: 04/11/2024 at 12:57PM EDT

\$19.90

\$0.00

\$0.00

\$69.58

\$70.78

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55	\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60	\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65	\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70	\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75	\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80	\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90	\$50.45	\$9.95	\$22.74	\$0.00	\$83.14
Effect	ive Date - 07/01/2024				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50	\$28.63	\$9.95	\$0.00	\$0.00	\$38.58
2	55	\$31.49	\$9.95	\$6.66	\$0.00	\$48.10
3	60	\$34.36	\$9.95	\$7.26	\$0.00	\$51.57
4	65	\$37.22	\$9.95	\$7.87	\$0.00	\$55.04
5	70	\$40.08	\$9.95	\$20.32	\$0.00	\$70.35
6	75	\$42.95	\$9.95	\$20.93	\$0.00	\$73.83
7	80	\$45.81	\$9.95	\$21.53	\$0.00	\$77.29
8	90	\$51.53	\$9.95	\$22.74	\$0.00	\$84.22
Notes						
	Steps are 750 hrs.					
Appro	entice to Journeyworker Ratio:1					
	SANDBLAST, NEW) *	01/01/2024	\$38.83	\$9.65	\$19.90	\$0.00
ore of su	rfaces to be painted are new cons	truction, 07/01/2024	\$40.03	\$9.65	\$19.90	\$0.00

07/01/2024

01/01/2025

\$40.03

\$41.23

\$9.65

\$9.65

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\$19.90

\$0.00

\$0.00

\$67.20

\$68.40

Step	ive Date - 01/01/2024	Apprentice Base Wage	Haalth	Pension	Supplemental Unemployment	Total Rate	
	percent						
1	50	\$19.42	\$9.95	\$0.00	\$0.00	\$29.37	
2	55	\$21.36	\$9.95	\$4.43	\$0.00	\$35.74	
3	60	\$23.30	\$9.95	\$4.83	\$0.00	\$38.08	
4	65	\$25.24	\$9.95	\$5.23	\$0.00	\$40.42	
5	70	\$27.18	\$9.95	\$17.49	\$0.00	\$54.62	
6	75	\$29.12	\$9.95	\$17.89	\$0.00	\$56.96	
7	80	\$31.06	\$9.95	\$18.29	\$0.00	\$59.30	
8	90	\$34.95	\$9.95	\$19.10	\$0.00	\$64.00	
Effect	ive Date - 07/01/2024				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$20.02	\$9.95	\$0.00	\$0.00	\$29.97	
2	55	\$22.02	\$9.95	\$4.43	\$0.00	\$36.40	
3	60	\$24.02	\$9.95	\$4.83	\$0.00	\$38.80	
4	65	\$26.02	\$9.95	\$5.23	\$0.00	\$41.20	
5	70	\$28.02	\$9.95	\$17.49	\$0.00	\$55.46	
6	75	\$30.02	\$9.95	\$17.89	\$0.00	\$57.86	
7	80	\$32.02	\$9.95	\$18.29	\$0.00	\$60.26	
8	90	\$36.03	\$9.95	\$19.10	\$0.00	\$65.08	
Notes:							
	Steps are 750 hrs.						
Appre	entice to Journeyworker Ratio:1:1						
	SANDBLAST, REPAINT)	01/01/2024	\$36.15	\$9.95	\$19.90	\$0.00	\$66
L 35 - ZON	E 3	07/01/2024	\$37.35	\$9.95	\$19.90	\$0.00	\$6′

07/01/2024

01/01/2025

\$37.35

\$38.55

\$9.95

\$9.95

Issue Date: 04/08/2024 Wage Request Number: 20240408-016 Page 21 of 34

\$19.90

\$0.00

\$0.00

\$68.48

\$69.68

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3

	tive Date - 01/01/2024				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$18.08	\$9.95	\$0.00	\$0.00	\$28.03	
2	55	\$19.88	\$9.95	\$4.43	\$0.00	\$34.26	
3	60	\$21.69	\$9.95	\$4.83	\$0.00	\$36.47	
4	65	\$23.50	\$9.95	\$5.23	\$0.00	\$38.68	
5	70	\$25.31	\$9.95	\$17.49	\$0.00	\$52.75	
6	75	\$27.11	\$9.95	\$17.89	\$0.00	\$54.95	
7	80	\$28.92	\$9.95	\$18.29	\$0.00	\$57.16	
8	90	\$32.54	\$9.95	\$19.10	\$0.00	\$61.59	
Effect	tive Date - 07/01/2024				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$18.68	\$9.95	\$0.00	\$0.00	\$28.63	
2	55	\$20.54	\$9.95	\$4.43	\$0.00	\$34.92	
3	60	\$22.41	\$9.95	\$4.83	\$0.00	\$37.19	
4	65	\$24.28	\$9.95	\$5.23	\$0.00	\$39.46	
5	70	\$26.15	\$9.95	\$17.49	\$0.00	\$53.59	
6	75	\$28.01	\$9.95	\$17.89	\$0.00	\$55.85	
7	80	\$29.88	\$9.95	\$18.29	\$0.00	\$58.12	
8	90	\$33.62	\$9.95	\$19.10	\$0.00	\$62.67	
Notes	:						
	Steps are 750 hrs.						
Appro	entice to Journeyworker Ratio:1						
	RUSH, NEW) *	01/01/2024	\$37.43	\$9.95	\$19.90	\$0.00	\$67.2
or more of su	rfaces to be painted are new constr	ruction, 07/01/2024	\$38.63	\$9.95	\$19.90	\$0.00	\$68.4

07/01/2024

01/01/2025

\$38.63

\$39.83

\$9.95

\$9.95

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\$19.90

\$0.00

\$0.00

\$65.80

\$67.00

PAINTERS LOCAL 35 - ZONE 3

Step	ive Date - 01/01/2024 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
$\frac{3 \text{CP}}{1}$						
	50	\$18.72	\$9.95	\$0.00	\$0.00	\$28.67
2	55	\$20.59	\$9.95	\$4.43	\$0.00	\$34.97
3	60	\$22.46	\$9.95	\$4.83	\$0.00	\$37.24
4	65	\$24.33	\$9.95	\$5.23	\$0.00	\$39.51
5	70	\$26.20	\$9.95	\$17.49	\$0.00	\$53.64
6	75	\$28.07	\$9.95	\$17.89	\$0.00	\$55.91
7	80	\$29.94	\$9.95	\$18.29	\$0.00	\$58.18
8	90	\$33.69	\$9.95	\$19.10	\$0.00	\$62.74
Effect	ive Date - 07/01/2024				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50	\$19.32	\$9.95	\$0.00	\$0.00	\$29.27
2	55	\$21.25	\$9.95	\$4.43	\$0.00	\$35.63
3	60	\$23.18	\$9.95	\$4.83	\$0.00	\$37.96
3 4	60 65	\$23.18 \$25.11	\$9.95 \$9.95	\$4.83 \$5.23	\$0.00 \$0.00	\$37.96 \$40.29
4	65	\$25.11 \$27.04	\$9.95	\$5.23 \$17.49	\$0.00 \$0.00	\$40.29 \$54.48
4 5	65 70 75	\$25.11 \$27.04 \$28.97	\$9.95 \$9.95 \$9.95	\$5.23 \$17.49 \$17.89	\$0.00 \$0.00 \$0.00	\$40.29 \$54.48 \$56.81
4 5 6	65 70	\$25.11 \$27.04 \$28.97 \$30.90	\$9.95 \$9.95 \$9.95 \$9.95	\$5.23 \$17.49 \$17.89 \$18.29	\$0.00 \$0.00 \$0.00 \$0.00	\$40.29 \$54.48 \$56.81 \$59.14
4 5 6 7	65 70 75 80	\$25.11 \$27.04 \$28.97	\$9.95 \$9.95 \$9.95	\$5.23 \$17.49 \$17.89	\$0.00 \$0.00 \$0.00	\$40.29 \$54.48 \$56.81
4 5 6 7	65 70 75 80 90	\$25.11 \$27.04 \$28.97 \$30.90	\$9.95 \$9.95 \$9.95 \$9.95	\$5.23 \$17.49 \$17.89 \$18.29	\$0.00 \$0.00 \$0.00 \$0.00	\$40.29 \$54.48 \$56.81 \$59.14
4 5 6 7 8	65 70 75 80 90	\$25.11 \$27.04 \$28.97 \$30.90	\$9.95 \$9.95 \$9.95 \$9.95	\$5.23 \$17.49 \$17.89 \$18.29	\$0.00 \$0.00 \$0.00 \$0.00	\$40.29 \$54.48 \$56.81 \$59.14

07/01/2024

01/01/2025

\$35.95

\$37.15

\$9.95

\$9.95

Issue Date: 04/08/2024 Wage Request Number: 20240408-016 Page 23 of 34 **Apprentice -** *PAINTER Local 35 Zone 3 - BRUSH REPAINT*

	Appre Effecti	ive Date -	01/01/2024				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	<i>;</i>
	1	50		\$17.38	\$9.95	\$0.00	\$0.00	\$27.33	
	2	55		\$19.11	\$9.95	\$4.43	\$0.00	\$33.49	ı
	3	60		\$20.85	\$9.95	\$4.83	\$0.00	\$35.63	
	4	65		\$22.59	\$9.95	\$5.23	\$0.00	\$37.77	
	5	70		\$24.33	\$9.95	\$17.49	\$0.00	\$51.77	
	6	75		\$26.06	\$9.95	\$17.89	\$0.00	\$53.90	ı
	7	80		\$27.80	\$9.95	\$18.29	\$0.00	\$56.04	
	8	90		\$31.28	\$9.95	\$19.10	\$0.00	\$60.33	
	Effect	ive Date -	07/01/2024				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	;
	1	50		\$17.98	\$9.95	\$0.00	\$0.00	\$27.93	
	2	55		\$19.77	\$9.95	\$4.43	\$0.00	\$34.15	
	3	60		\$21.57	\$9.95	\$4.83	\$0.00	\$36.35	
	4	65		\$23.37	\$9.95	\$5.23	\$0.00	\$38.55	
	5	70		\$25.17	\$9.95	\$17.49	\$0.00	\$52.61	
	6	75		\$26.96	\$9.95	\$17.89	\$0.00	\$54.80	ı
	7	80		\$28.76	\$9.95	\$18.29	\$0.00	\$57.00	ı
	8	90		\$32.36	\$9.95	\$19.10	\$0.00	\$61.41	
	Notes:							. — — —	
		Steps are	750 hrs.						
	Appre	entice to Jou	urneyworker Ratio:1:1						
PAINTER TR. LABORERS - ZON			(HEAVY/HIGHWAY)	12/01/2023	\$33.63	\$9.65	\$14.78	\$0.00	\$58.06
LABOKEKS - ZOI	VE 3 (HEAV	Y & HIGHWA	1)	06/01/2024	\$34.83	\$9.65	\$14.78	\$0.00	\$59.26
				12/01/2024	\$36.03	\$9.65	\$14.78	\$0.00	\$60.46
				06/01/2025	\$37.28	\$9.65	\$14.78	\$0.00	\$61.71
				12/01/2025	\$38.52	\$9.65	\$14.78	\$0.00	\$62.95
				06/01/2026	\$39.82	\$9.65	\$14.78	\$0.00	\$64.25
For apprentic	e rates see '	"Apprentice- L	ABORER (Heavy and Highway)	12/01/2026	\$41.11	\$9.65	\$14.78	\$0.00	\$65.54
PANEL & PIC	KUP TR	UCKS DRI	VER	01/01/2024	\$38.78	\$15.07	\$18.67	\$0.00	\$72.52
TEAMSTERS JOI	NT COUNC	'IL NO. 10 ZO I	NE B	06/01/2024			\$18.67	\$0.00	\$73.52
				12/01/2024			\$20.17	\$0.00	\$75.02
				01/01/2025			\$20.17	\$0.00	\$75.52
				06/01/2025			\$20.17	\$0.00	\$76.52
				12/01/2025			\$21.78	\$0.00	\$78.13
								\$0.00	
				01/01/2026	\$40.78	\$16.17	\$21.78	30.00	\$78.73
				01/01/2026 06/01/2026			\$21.78 \$21.78	\$0.00	\$78.73 \$79.73
					\$41.78	\$16.17			

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
DECK)						
PILE DRIVER LOCAL 56 (ZONE 3)						
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
PILE DRIVER LOCAL 56 (ZONE 3)	*****	4	4			4, 3, 3,

Effective Date - 08/01/202 Step percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total F	Rate
1 0	\$0.00	\$0.00	\$0.00	\$0.00	\$0	0.00
(Same as set in Zone	6.87/4\$69.32/5\$71.78/6\$71.78/7\$76.68/8	\$76.68				
IPELAYER ABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY)	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
ABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
For apprentice rates see "Apprentice- LABORER (He	$12/01/2026 \label{eq:control}$ eavy and Highway)	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
LUMBER & PIPEFITTER LUMBERS & PIPEFITTERS LOCAL 104	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

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Apprentice - *PLUMBER/PIPEFITTER - Local 104*

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	Step	ive Date - 03/17/2024 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment		tal Rate
	1	45	\$22.14	\$9.55	\$10.10	\$0.00		\$41.79
	2	50	\$24.61	\$9.55	\$10.10	\$0.00		\$44.26
	3	55	\$27.07	\$9.55	\$10.10	\$0.00		\$46.72
	4	60	\$29.53	\$9.55	\$10.10	\$0.00		\$49.18
	5	65	\$31.99	\$9.55	\$10.10	\$0.00		\$51.64
	6	70	\$34.45	\$9.55	\$10.10	\$0.00		\$54.10
	7	75	\$36.91	\$9.55	\$10.10	\$0.00		\$56.56
	8	80	\$39.37	\$9.55	\$10.10	\$0.00		\$59.02
	9	80	\$39.37	\$9.55	\$17.10	\$0.00		\$66.02
	10	80	\$39.37	\$9.55	\$17.10	\$0.00		\$66.02
	 	**1:1,2:5,3:9,4:12						-
NEUMATIC		ntice to Journeyworker R OLS (TEMP.)	03/17/202	4 \$49.2	1 \$9.55	\$17.10	\$0.00	\$75.
PLUMBERS & PI		, ,	03/17/202	1 φ 1 9.2	1 \$9.55	\$17.10	\$0.00	Φ/3.
		"Apprentice- PIPEFITTER" or "PI						
	DRILL/	TOOL OPERATOR (HEAV	Y & 12/01/202	3 \$33.8	8 \$9.65	\$14.78	\$0.00	\$58.
IIGHWAY) <i>aborers - zon</i>	VE 3 (HEAV	Y & HIGHWAY)	06/01/202	4 \$35.0	8 \$9.65	\$14.78	\$0.00	\$59.
			12/01/202	4 \$36.2	8 \$9.65	\$14.78	\$0.00	\$60.
			06/01/202	5 \$37.5	3 \$9.65	\$14.78	\$0.00	\$61.
			12/01/202	5 \$38.7	7 \$9.65	\$14.78	\$0.00	\$63.
			06/01/202	6 \$40.0	7 \$9.65	\$14.78	\$0.00	\$64.
T		I A DODED (II	12/01/202	6 \$41.3	6 \$9.65	\$14.78	\$0.00	\$65.
• • • • • • • • • • • • • • • • • • • •		"Apprentice- LABORER (Heavy a						
OWDERMA 4borers - zon	VE 3 (BUILI	DING & SITE)	12/01/202	3 \$35.1	3 \$9.40	\$16.59	\$0.00	\$61.
		"Apprentice- LABORER"						
OWDERMA aborers - zon		ASTER (HEAVY & HIGHV Y & <i>Highway</i>)	VAY) 12/01/202	3 \$34.6	3 \$9.65	\$14.78	\$0.00	\$59.
	(/	06/01/202	4 \$35.8	3 \$9.65	\$14.78	\$0.00	\$60.
			12/01/202	4 \$37.0	3 \$9.65	\$14.78	\$0.00	\$61.
			06/01/202	5 \$38.2	8 \$9.65	\$14.78	\$0.00	\$62.
			12/01/202		2 \$9.65	\$14.78	\$0.00	\$63.
			06/01/202			\$14.78	\$0.00	\$65.
For connect!	na rotas sa - 1	"Apprentice- LABORER (Heavy a	12/01/202	6 \$42.1	1 \$9.65	\$14.78	\$0.00	\$66.
UMP OPERA	ATOR (C	ONCRETE)	12/01/202	3 \$39.5	6 \$13.78	\$15.15	\$0.00	\$68.
PERATING ENC			JEEDS"					
UMP OPERA	ATOR (D	"Apprentice- OPERATING ENGINE EWATERING, OTHER)	12/01/202	3 \$39.0	3 \$13.38	\$15.15	\$0.00	\$67.
PERATING ENC	JINEERS L	OCAL 98						

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
READY-MIX CONCRETE DRIVER	05/01/2023	\$25.24	\$11.57	\$7.00	\$0.00	\$43.81
TEAMSTERS 404 - Construction Service (Northampton)	05/01/2024	\$26.14	\$11.82	\$7.25	\$0.00	\$45.21
RIDE-ON MOTORIZED BUGGY OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR OPERATING ENGINEERS LOCAL 98	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) ROOFERS LOCAL 248	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg) ROOFERS LOCAL 248	07/16/2023	\$38.41	\$10.35	\$18.00	\$0.00	\$66.76

Effe	rentice - <i>ROOFER - Local</i> ctive Date - 07/16/2023				Supplemental		
Step	percent	Apprentice Base Wage	e Health	Pension	Unemployment	Total Rate	e
1	60	\$23.05	\$10.35	\$0.00	\$0.00	\$33.40	0
2	65	\$24.97	\$10.35	\$18.00	\$0.00	\$53.32	2
3	70	\$26.89	\$10.35	\$18.00	\$0.00	\$55.24	4
4	75	\$28.81	\$10.35	\$18.00	\$0.00	\$57.16	6
5	80	\$30.73	\$10.35	\$18.00	\$0.00	\$59.08	8
6	85	\$32.65	\$10.35	\$18.00	\$0.00	\$61.00	0
7	90	\$34.57	\$10.35	\$18.00	\$0.00	\$62.92	2
8	95	\$36.49	\$10.35	\$18.00	\$0.00	\$64.84	4
 	Steps are 750 hrs.Roofer rentice to Journeyworker R	(Tear Off)1:1; Same as above					
OOFER SLATE / T	Steps are 750 hrs.Roofer rentice to Journeyworker R ILE / PRECAST CONCRET	Ratio:1:3	23 \$38.91	\$10.35	\$18.00	\$0.00	\$67.26
OOFER SLATE / T OOFERS LOCAL 248 For apprentice rates so	Steps are 750 hrs.Roofer	Eatio:1:3 E 07/16/202		·			
OOFER SLATE / T OOFERS LOCAL 248 For apprentice rates so CRAPER	Steps are 750 hrs.Roofer rentice to Journeyworker R ILE / PRECAST CONCRET re "Apprentice- ROOFER"	Ratio:1:3		·	\$18.00	\$0.00	\$67.26 \$67.56
OOFER SLATE / TOOFERS LOCAL 248 For apprentice rates so CRAPER PERATING ENGINEERS For apprentice rates so	Steps are 750 hrs.Roofers rentice to Journeyworker R ILE / PRECAST CONCRET re "Apprentice- ROOFER" SLOCAL 98 re "Apprentice- OPERATING ENGI	Ratio:1:3 SE 07/16/202 12/01/202 NEERS"		·			
POOFER SLATE / TOOFERS LOCAL 248 For apprentice rates so CRAPER PERATING ENGINEERS For apprentice rates so ELF-POWERED ROAMPERS) PERATING ENGINEERS	Steps are 750 hrs.Rooferd rentice to Journeyworker RILE / PRECAST CONCRET CONC	Ratio:1:3 TE 07/16/202 12/01/202 NEERS" DRS 12/01/202	23 \$39.03	\$13.38			
POOFER SLATE / TOOFERS LOCAL 248 For apprentice rates so CRAPER PERATING ENGINEERS For apprentice rates so ELF-POWERED ROAMPERS) PERATING ENGINEERS For apprentice rates so ELF-PROPELLED	Steps are 750 hrs.Roofern rentice to Journeyworker R ILE / PRECAST CONCRET rec "Apprentice- ROOFER" SLOCAL 98 rec "Apprentice- OPERATING ENGI OLLERS AND COMPACTO SLOCAL 98 rec "Apprentice- OPERATING ENGI POWER BROOM	Ratio:1:3 TE 07/16/202 12/01/202 NEERS" DRS 12/01/202	23 \$39.03 23 \$38.42	\$13.38 \$13.78	\$15.15	\$0.00	\$67.56
POOFER SLATE / TOOFERS LOCAL 248 For apprentice rates so ERAPER ERATING ENGINEERS FOR apprentice rates so ELF-POWERED ROAMPERS) ERATING ENGINEERS FOR apprentice rates so ELF-PROPELLED ERATING ENGINEERS	Steps are 750 hrs.Roofern rentice to Journeyworker R ILE / PRECAST CONCRET rec "Apprentice- ROOFER" SLOCAL 98 rec "Apprentice- OPERATING ENGI OLLERS AND COMPACTO SLOCAL 98 rec "Apprentice- OPERATING ENGI POWER BROOM	Ratio:1:3 SE 07/16/202 12/01/202 NEERS" DRS 12/01/202 NEERS" 12/01/202	23 \$39.03 23 \$38.42	\$13.38 \$13.78	\$15.15 \$15.15	\$0.00	\$67.56 \$67.35
POOFER SLATE / TOOFERS LOCAL 248 For apprentice rates so CRAPER For apprentice rates so CLF-POWERED ROAMPERS) FOR apprentice rates so CLF-PROPELLED FOR AMPERS FOR APPRENTING ENGINEERS	Steps are 750 hrs.Roofern rentice to Journeyworker R ILE / PRECAST CONCRET rec "Apprentice- ROOFER" SLOCAL 98 rec "Apprentice- OPERATING ENGING ENGINE	Ratio:1:3 SE 07/16/202 12/01/202 NEERS" DRS 12/01/202 NEERS" 12/01/202	23 \$39.03 23 \$38.42 23 \$35.80	\$13.38 \$13.78 \$13.78	\$15.15 \$15.15	\$0.00	\$67.56 \$67.35
OOFER SLATE / TOOFERS LOCAL 248 For apprentice rates so CRAPER PERATING ENGINEERS For apprentice rates so ELF-POWERED ROTAMPERS) PERATING ENGINEERS For apprentice rates so ELF-PROPELLED PERATING ENGINEERS	Steps are 750 hrs.Roofern rentice to Journeyworker R ILE / PRECAST CONCRET rec "Apprentice- ROOFER" SLOCAL 98 rec "Apprentice- OPERATING ENGING ENGINE	Ratio:1:3 TE 07/16/202 12/01/202 NEERS" 12/01/202 NEERS" 12/01/202 NEERS"	23 \$39.03 23 \$38.42 23 \$35.80 24 \$40.22	\$13.38 \$13.78 \$13.78	\$15.15 \$15.15	\$0.00 \$0.00 \$0.00	\$67.56 \$67.35 \$64.73

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\$23.52

\$0.00

\$82.53

\$16.77

Apprentice -	SHEET METAI	. WORKER -	- Local 63
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		ve Date - 01/01/2024	Zocar oz			Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	45	\$18.10	\$5.38	\$4.86	\$0.85	\$29.19	
	2	50	\$20.11	\$5.98	\$5.40	\$0.94	\$32.43	
	3	55	\$22.12	\$6.58	\$9.71	\$1.15	\$39.56	
	4	60	\$24.13	\$7.18	\$9.71	\$1.23	\$42.25	
	5	65	\$26.14	\$7.77	\$9.71	\$1.31	\$44.93	
	6	70	\$28.15	\$8.37	\$9.71	\$1.39	\$47.62	
	7	75	\$30.17	\$8.97	\$9.71	\$1.47	\$50.32	
	8	80	\$32.18	\$9.57	\$17.66	\$1.78	\$61.19	
	9	85	\$34.19	\$10.17	\$17.66	\$1.86	\$63.88	
	10	90	\$36.20	\$10.76	\$17.66	\$1.94	\$66.56	
	Effecti Step	ve Date - 07/01/2024 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
	1	45	\$18.66	\$5.38	\$4.86	\$0.85	\$29.75	
	2	50	\$20.74	\$5.98	\$5.40	\$0.94	\$33.06	
	3	55	\$22.81	\$6.58	\$9.71	\$1.15	\$40.25	
	4	60	\$24.88	\$7.18	\$9.71	\$1.23	\$43.00	
	5	65	\$26.96	\$7.77	\$9.71	\$1.31	\$45.75	
	6	70	\$29.03	\$8.37	\$9.71	\$1.39	\$48.50	
	7	75	\$31.10	\$8.97	\$9.71	\$1.47	\$51.25	
	8	80	\$33.18	\$9.57	\$17.66	\$1.78	\$62.19	
	9	85	\$35.25	\$10.17	\$17.66	\$1.86	\$64.94	
	10	90	\$37.32	\$10.76	\$17.66	\$1.94	\$67.68	
	Notes:							
	Appre	ntice to Journeyworker Ratio:1:3						
ECIALIZED EARTH MOVING EQUIP < 35 TONS		01/01/202	4 \$39.24	\$15.07	\$18.67	\$0.00	\$72.98	
MSTERS JOI	ISTERS JOINT COUNCIL NO. 10 ZONE B		06/01/202				\$0.00	\$73.98
			12/01/202			\$20.17	\$0.00	\$75.48
			01/01/202		\$15.57	\$20.17	\$0.00	\$75.98
			06/01/202	5 \$41.24	\$15.57	\$20.17	\$0.00	\$76.98
			12/01/202				\$0.00	\$78.59
			01/01/202	6 \$41.24	\$16.17	\$21.78	\$0.00	\$79.19
			06/01/202			\$21.78	\$0.00	\$80.19
			12/01/202			\$23.52	\$0.00	

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01/01/2027

\$42.24

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS	01/01/2024	\$39.53	\$15.07	\$18.67	\$0.00	\$73.27
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$40.53	\$15.07	\$18.67	\$0.00	\$74.27
	12/01/2024	\$40.53	\$15.07	\$20.17	\$0.00	\$75.77
	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 669	04/01/2023	\$47.43	\$11.45	\$16.61	\$0.00	\$75.49

	Step	ive Date - 04/01/2023 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
	1	45	\$21.34	\$8.22	\$0.00	\$0.00	\$29.56	
	2	50	\$23.72	\$8.22	\$0.00	\$0.00	\$31.94	
	3	55	\$26.09	\$11.45	\$7.20	\$0.00	\$44.74	
	4	60	\$28.46	\$11.45	\$8.35	\$0.00	\$48.26	
	5	65	\$30.83	\$11.45	\$8.35	\$0.00	\$50.63	
	6	70	\$33.20	\$11.45	\$8.60	\$0.00	\$53.25	
	7	75	\$35.57	\$11.45	\$8.60	\$0.00	\$55.62	
	8	80	\$37.94	\$11.45	\$8.60	\$0.00	\$57.99	
	9	85	\$40.32	\$11.45	\$8.60	\$0.00	\$60.37	
	10	90	\$42.69	\$11.45	\$8.60	\$0.00	\$62.74	
	Notes							
	Appre	entice to Journeyworker Ratio	:1:1					
ECOMMU		ION TECHNICIAN	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
TRICLING L	OCAL /		06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
			12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
			06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
			12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
			06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
			01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

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\$23.59

\$23.59

\$23.59

\$23.59

\$23.59

\$11.49

\$11.49

\$11.49

\$11.49

\$11.49

\$0.00

\$0.00

\$0.00

\$0.00

\$0.00

\$99.82

\$101.97

\$103.32

\$105.52

\$106.92

	Apprer		ECHNICIAN - Local 7					
	Effection Step	ve Date - 12/31/2023 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
	1	40	\$19.60	\$7.05	\$0.59	\$0.00	\$27.24	
	2	45	\$22.05	\$7.05	\$0.66	\$0.00	\$29.76	
	3	50	\$24.51	\$12.75	\$7.34	\$0.00	\$44.60	
	4	55	\$26.96	\$12.75	\$7.41	\$0.00	\$47.12	
	5	65	\$31.86	\$12.75	\$9.52	\$0.00	\$54.13	
	6	70	\$34.31	\$12.75	\$10.90	\$0.00	\$57.96	
	Effecti	ve Date - 06/30/2024				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	40	\$20.00	\$7.20	\$0.60	\$0.00	\$27.80	
	2	45	\$22.50	\$7.20	\$0.68	\$0.00	\$30.38	
	3	50	\$25.01	\$13.00	\$7.40	\$0.00	\$45.41	
	4	55	\$27.51	\$13.00	\$7.48	\$0.00	\$47.99	
	5	65	\$32.51	\$13.00	\$9.64	\$0.00	\$55.15	
_	6	70	\$35.01	\$13.00	\$11.06	\$0.00	\$59.07	
024 at 12:5 / PWI ED	Notes:						!	
)24 at		Steps are 800 hours						
N I	Appre	ntice to Journeyworker Ratio:1:1						
TERRAZZO FIN			02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
BRICKLAYERS LOC	AL 3 (SPI	R/PITT) - MARBLE & TILE	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52

02/01/2025

08/01/2025

02/10/2026

08/01/2026

02/01/2027

\$64.74

\$66.89

\$68.24

\$70.44

\$71.84

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\$23.56

\$23.56

\$23.56

\$23.56

\$23.56

\$23.56

\$11.49

\$11.49

\$11.49

\$11.49

\$11.49

\$11.49

\$0.00

\$0.00

\$0.00

\$0.00

\$0.00

\$0.00

\$99.57

\$100.87

\$103.02

\$104.37

\$106.57

\$107.97

	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$30.67	\$11.49	\$23.59	\$0.00	\$65.75	
2	60	\$36.80	\$11.49	\$23.59	\$0.00	\$71.88	
3	70	\$42.94	\$11.49	\$23.59	\$0.00	\$78.02	
4	80	\$49.07	\$11.49	\$23.59	\$0.00	\$84.15	
5	90	\$55.21	\$11.49	\$23.59	\$0.00	\$90.29	
Effecti Step	ve Date - 08/01/2024 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
$\frac{\operatorname{step}}{1}$	50	\$31.72	\$11.49	\$23.59	\$0.00	\$66.80	
2	60	\$38.06	\$11.49	\$23.59	\$0.00	\$73.14	
3	70	\$44.41	\$11.49	\$23.59	\$0.00	\$79.49	
4	80	\$50.75	\$11.49	\$23.59	\$0.00	\$85.83	
5	90	\$57.10	\$11.49	\$23.59	\$0.00	\$92.18	
Notes:						${\mid}$	
Appre	ntice to Journeyworker Ratio:1:5						

08/01/2024

02/01/2025

08/01/2025

02/01/2026

08/01/2026

02/01/2027

\$64.52

\$65.82

\$67.97

\$69.32

\$71.52

\$72.92

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Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)

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	Lifeti	ive Date -	02/01/2024				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50		\$31.21	\$11.49	\$23.56	\$0.00	\$66.26	
	2	60		\$37.45	\$11.49	\$23.56	\$0.00	\$72.50	
	3	70		\$43.69	\$11.49	\$23.56	\$0.00	\$78.74	
	4	80		\$49.94	\$11.49	\$23.56	\$0.00	\$84.99	
	5	90		\$56.18	\$11.49	\$23.56	\$0.00	\$91.23	
	Effecti	ive Date -	08/01/2024				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	:
	1	50		\$32.26	\$11.49	\$23.56	\$0.00	\$67.31	
	2	60		\$38.71	\$11.49	\$23.56	\$0.00	\$73.76	
	3	70		\$45.16	\$11.49	\$23.56	\$0.00	\$80.21	
	4	80		\$51.62	\$11.49	\$23.56	\$0.00	\$86.67	
	5	90		\$58.07	\$11.49	\$23.56	\$0.00	\$93.12	
	Notes:		- — — — — –					. — — —	
			urneyworker Ratio:1:5						
EST BORING 4BORERS - FOU			F.	12/01/2023	\$48.33	\$9.65	\$18.22	\$0.00	\$76.2
ABOKEKS - FOO	INDATION	AND MAKINI	2	06/01/2024	4 \$49.81	\$9.65	\$18.22	\$0.00	\$77.6
				12/01/2024	\$51.28	\$9.65	\$18.22	\$0.00	\$79.1
				06/01/2025	5 \$52.78	\$9.65	\$18.22	\$0.00	\$80.6
				12/01/2025	5 \$54.28	\$9.65	\$18.22	\$0.00	\$82.1
				06/01/2026	\$55.83	\$9.65	\$18.22	\$0.00	\$83.7
				12/01/2026	5 \$57.33	\$9.65	\$18.22	\$0.00	\$85.2
		'Apprentice- L							
EST BORING Aborers - fou				12/01/2023		\$9.65	\$18.22	\$0.00	\$72.3
				06/01/2024		\$9.65	\$18.22	\$0.00	\$73.8
				12/01/2024			\$18.22	\$0.00	\$75.2
				06/01/2025			\$18.22	\$0.00	\$76.7
				12/01/2025			\$18.22	\$0.00	\$78.2
				06/01/2020		\$9.65	\$18.22	\$0.00	\$79.8
For appropria	e rates see !	'Apprentice- L	ABORER"	12/01/2026	5 \$53.45	\$9.65	\$18.22	\$0.00	\$81.3
EST BORING				10/01/000	0 044.22	eo cc	\$19.22	00.00	672.2
ABORERS - FOU			Ξ	12/01/2023		\$9.65	\$18.22	\$0.00	\$72.2
				06/01/2024		\$9.65	\$18.22	\$0.00	\$73.6
				12/01/2024			\$18.22	\$0.00	\$75.1
				06/01/2025			\$18.22	\$0.00	\$76.6
				12/01/2025			\$18.22	\$0.00	\$78.1
				06/01/2026 12/01/2026		\$9.65 \$9.65	\$18.22 \$18.22	\$0.00 \$0.00	\$79.7 \$81.2

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TRACTORS OPERATING ENGINEERS LOCAL 98	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT	01/01/2024	\$39.82	\$15.07	\$18.67	\$0.00	\$73.56
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$40.82	\$15.07	\$18.67	\$0.00	\$74.56
	12/01/2024	\$40.82	\$15.07	\$20.17	\$0.00	\$76.06
	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
	01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11
TUNNEL WORK - COMPRESSED AIR	12/01/2023	\$56.56	\$9.65	\$18.67	\$0.00	\$84.88
LABORERS (COMPRESSED AIR)	06/01/2024	\$58.04	\$9.65	\$18.67	\$0.00	\$86.36
	12/01/2024	\$59.51	\$9.65	\$18.67	\$0.00	\$87.83
	06/01/2025	\$61.01	\$9.65	\$18.67	\$0.00	\$89.33
	12/01/2025	\$62.51	\$9.65	\$18.67	\$0.00	\$90.83
	06/01/2026	\$64.06	\$9.65	\$18.67	\$0.00	\$92.38
	12/01/2026	\$65.56	\$9.65	\$18.67	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	12/01/2023	\$58.56	\$9.65	\$18.67	\$0.00	\$86.88
BORERS (COMPRESSED AIR)	06/01/2024	\$60.04	\$9.65	\$18.67	\$0.00	\$88.36
	12/01/2024	\$61.51	\$9.65	\$18.67	\$0.00	\$89.83
	06/01/2025	\$63.01	\$9.65	\$18.67	\$0.00	\$91.33
	12/01/2025	\$64.51	\$9.65	\$18.67	\$0.00	\$92.83
	06/01/2026	\$66.06	\$9.65	\$18.67	\$0.00	\$94.38
	12/01/2026	\$67.56	\$9.65	\$18.67	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR LABORERS (FREE AIR TUNNEL)	12/01/2023	\$48.63	\$9.65	\$18.67	\$0.00	\$76.95
	06/01/2024	\$50.11	\$9.65	\$18.67	\$0.00	\$78.43
	12/01/2024	\$51.58	\$9.65	\$18.67	\$0.00	\$79.90
	06/01/2025	\$53.08	\$9.65	\$18.67	\$0.00	\$81.40
	12/01/2025	\$54.58	\$9.65	\$18.67	\$0.00	\$82.90
	06/01/2026	\$56.13	\$9.65	\$18.67	\$0.00	\$84.45
For apprentice rates see "Apprentice- LABORER"	12/01/2026	\$57.63	\$9.65	\$18.67	\$0.00	\$85.95
TUNNEL WORK - FREE AIR (HAZ. WASTE)	12/01/2022	\$50.62	\$0.65	\$18.67	\$0.00	\$70.0 <i>E</i>
LABORERS (FREE AIR TUNNEL)	12/01/2023	\$50.63	\$9.65		\$0.00	\$78.95
	06/01/2024	\$52.11	\$9.65	\$18.67	\$0.00	\$80.43
	12/01/2024	\$53.58	\$9.65	\$18.67	\$0.00	\$81.90
	06/01/2025	\$55.08	\$9.65	\$18.67	\$0.00	\$83.40
	12/01/2025	\$56.58	\$9.65	\$18.67	\$0.00	\$84.90
	06/01/2026	\$58.13	\$9.65	\$18.67	\$0.00	\$86.45
For apprentice rates see "Apprentice- LABORER"	12/01/2026	\$59.63	\$9.65	\$18.67	\$0.00	\$87.95

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
VAC-HAUL	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
WAGON DRILL OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.40	\$16.59	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
WATER METER INSTALLER PLUMBERS & PIPEFITTERS LOCAL 104	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

- ** Multiple ratios are listed in the comment field.
- *** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
- **** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

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

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WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form is available from the Department of Labor Standards (DLS) at www.mass.gov/dols/pw and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

On a weekly basis, every contractor and subcontractor is required to submit a certified copy of their weekly payroll records to the awarding authority; this includes the payroll forms and the Statement of Compliance form. The certified payroll records must be submitted either by regular mail or by e-mail to the awarding authority. Once collected, the awarding authority is required to preserve those records for three years from the date of completion of the project.

Each such contractor and subcontractor shall furnish weekly **and** within 15 days after completion of its portion of the work, to the awarding authority directly by first-class mail or e-mail, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form, accompanied by their payroll:

	, 20
I,	,
(Name of signatory party)	(Title)
do hereby state:	
That I pay or supervise the	payment of the persons employed by
	on the
(Contractor, subcontractor or public boo	(Building or project)
and that all mechanics and apprentic	ces, teamsters, chauffeurs and laborers employed on
said project have been paid in accor	dance with wages determined under the provisions of
1 5	en of chapter one hundred and forty nine of the
General Laws.	
C	ignature

NOTICE: - This is NOT the official version of the Massachusetts General Laws (MGL). While reasonable efforts have been made to assure the accuracy of the data provided, do not rely on this information without first checking an official edition of the MGL.

If you are in need of legal advice or counsel, consult an attorney.

MASSACHUSETTS GENERAL LAWS

(**Updated to July 12, 2013**)

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CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES **Chapter 30: Section 38A Price adjustment clause**

Contracts for road, bridge, water, and sewer projects awarded as a result of a proposal or invitation for bids under chapter 7C, section 11C of Chapter 25A, section 39M of this chapter and sections 44A to 44H, inclusive, of chapter 149 shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provided for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.

Chapter 30: Section 39F Construction contracts; assignment and subrogation; subcontractor defined; enforcement of claim for direct payment; deposit, reduction of disputed amounts

Section 39F. (1) Every contract awarded pursuant to sections forty-four A to L, inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

- (a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.
- (b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.
- (c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials

furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

- (d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.
- (e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

- (f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.
- (g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.
- (h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.
- (i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g) and (h).
- (2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

- (3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.
- (4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fiftynine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).
- (5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part

(iii) of subparagraph (e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction.

CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES

Chapter 30: Section 39I Deviations from plans and specifications

Section 39I. Every contractor having a contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or public works for the commonwealth, or of any political subdivision thereof, shall perform all the work required by such contract in conformity with the plans and specifications contained therein. No wilful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the awarding authority or by the engineer or architect in charge of the work who is duly authorized by the awarding authority to approve such deviations. In order to avoid delays in the prosecution of the work required by such contract such deviation from the plans or specifications may be authorized by a written order of the awarding authority or such engineer or architect so authorized to approve such deviation. Within thirty days thereafter, such written order shall be confirmed by a certificate of the awarding authority stating: (1) If such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the project as a whole; (3) that either the work substituted for the work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the contracting agency and the contractor and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the contracting authority.

Such certificate shall be signed under the penalties of perjury and shall be a permanent part of the file record of the work contracted for.

Whoever violates any provision of this section wilfully and with intent to defraud shall be punished by a fine of not more than five thousand dollars or by imprisonment for not more than six months, or both.

Chapter 30: Section 39J Public construction contracts; effect of decisions of contracting body or administrative board

Section 39L. The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for the work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with the awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth.

Chapter 30: Section 39L Public construction work by foreign corporations; restrictions and reports

Section 39L. The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for the work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with the awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth.

Chapter 30: Section 39M Contracts for construction and materials; manner of awarding

Section 38A. Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.

Section 39M. (a) Every contract for the construction, reconstruction, alteration, remodeling or repair of any public work, or for the purchase of any material, as hereinafter defined, by the commonwealth, or political subdivision thereof, or by any county, city, town, district, or housing authority, and estimated by the awarding authority to cost more than ten thousand dollars, and every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency, as defined by subsection one of section forty-four A of chapter one hundred and forty-nine, estimated to cost more than \$25,000 but not more than \$100,000, shall be awarded to the lowest responsible and eligible bidder on the basis of competitive bids publicly opened and read by such awarding authority forthwith upon expiration of the time for the filing thereof; provided, however, that such awarding authority may reject any and all bids, if it is in the public interest to do so. Every bid for such contract shall be accompanied by a bid deposit in the form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the awarding authority. The amount of such bid deposit shall be five per cent of the value of the bid. Any person submitting a bid under this section shall, on such bid, certify as follows:

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

(Name of person signing bid)	
(Company)	

This paragraph shall not apply to the award of any contract subject to the provisions of sections forty-four A to forty-four J, inclusive, of chapter one hundred and forty-nine and every such contract shall continue to be awarded as provided therein. In cases of extreme emergency caused by enemy attack, sabotage or other such hostile actions or resulting from an imminent security threat explosion, fire, flood, earthquake, hurricane, tornado or other such catastrophe, an awarding authority may, without competitive bids and notwithstanding any general or specific law, award contracts otherwise subject to this paragraph to perform work and to purchase or rent materials and equipment, all as may be necessary for temporary repair and restoration to service of any and all public work in order to preserve the health and safety of persons or property; provided, that this exception shall not apply to any permanent reconstruction, alteration, remodeling or repair of any public work.

- (b) Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if, in the opinion of the awarding authority: (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications. For each item of material the specifications shall provide for either a minimum of three named brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said name or described materials.
- (c) The term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder; and (5) who obtains within 10 days of the notification of contract award the security by bond required under section 29 of chapter

149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority; provided further, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

- (d) The provisions of this section shall not apply (1) to the extent that they prevent the approval of such specifications by any contributing federal agency, (2) to materials purchased under specifications of the state department of highways at prices established by the said department pursuant to advertisement and bidding in connection with work to be performed under the provisions of chapter eighty-one or chapter ninety, (3) to any transaction between the commonwealth and any of its political subdivisions or between the commonwealth and any public service corporation, and (4) to any contract of not more than twenty-five thousand dollars awarded by a governmental body, as defined by section two of chapter thirty B, in accordance with the provisions of section five of said chapter thirty B; and (5) to any contract solely for the purchase of material awarded by a governmental body, as defined by section 2 of chapter 30B, in accordance with section 5 of said chapter 30B.
- (e) The word "material" as used in this section shall mean and include any article, assembly, system, or any component part thereof.

Chapter 30: Section 39N Construction contracts; equitable adjustment in contract price for differing subsurface or latent physical conditions

Section 39N. Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.

Chapter 30: Section 39O Contracts for construction and materials; suspension, delay or interruption due to order of awarding authority; adjustment in contract price; written claim

Section 390. 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.

Chapter 30: Section 39P Contracts for construction and materials; awarding authority's decisions on interpretation of specifications, etc.; time limit; notice

Section 39P. Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made.

Chapter 30: Section 39R Definitions; contract provisions; management and financial statements; enforcement

Section 39R. (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 A 1/2 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 A 1/2 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).

CHAPTER 82. THE LAYING OUT, ALTERATION, RELOCATION AND DISCONTINUANCE OF PUBLIC WAYS, AND SPECIFIC REPAIRS THEREON

EXCAVATIONS; NOTICES; PENALTIES

Chapter 82: Section 40 Definitions

Section 40. The following words, as used in this section and sections 40A to 40E, inclusive, shall have the following meanings:—

"Company", natural gas pipeline company, petroleum or petroleum products pipeline company, public utility company, cable television company, and municipal utility company or department that supply gas, electricity, telephone, communication or cable television services or private water companies within the city or town where such excavation is to be made.

"Description of excavation location", such description shall include the name of the city or town, street, way, or route number where appropriate, the name of the streets at the nearest intersection to the excavation, the number of the buildings closest to the excavation or any other description, including landmarks, utility pole numbers or other information which will accurately define the location of the excavation.

"Emergency", a condition in which the safety of the public is in imminent danger, such as a threat to life or health or where immediate correction is required to maintain or restore essential public utility service.

"Excavation", an operation for the purpose of movement or removal of earth, rock or the materials in the ground including, but not limited to, digging, blasting, augering, backfilling, test boring, drilling, pile driving, grading, plowing in, hammering, pulling in, jacking in, trenching, tunneling and demolition of structures, excluding excavation by tools manipulated only by human power for gardening purposes and use of blasting for quarrying purposes.

"Excavator", any entity including, but not limited to, a person, partnership, joint venture, trust, corporation, association, public utility, company or state or local government body which performs excavation operations.

"Premark", to delineate the general scope of the excavation or boring on the paved surface of the ground using white paint, or stakes or other suitable white markings on nonpaved surfaces. No premarking shall be acceptable if such marks can reasonably interfere with traffic or pedestrian control or are misleading to the general public. Premarking shall not be required of any continuous excavation that is over 500 feet in length.

"Safety zone", a zone designated on the surface by the use of standard color-coded markings which contains the width of the facilities plus not more than 18 inches on each side.

"Standard color-coded markings", red - electric power lines, cables, conduit or light cables; yellow - gas, oil, street petroleum, or other gaseous materials; orange - communications cables or conduit, alarm or signal lines; blue - water, irrigation and slurry lines; green - sewer and drain lines; white - premark of proposed excavation.

"System", the underground plant damage prevention system as defined in section 76D of chapter 164.

Chapter 82: Section 40A Excavations; notice

Section 40A. No excavator installing a new facility or an addition to an existing facility or the relay or repair of an existing facility shall, except in an emergency, make an excavation, in any public or private way, any company right-of-way or easement or any public or privately owned land or way, unless at least 72 hours, exclusive of Saturdays, Sundays and legal holidays but not more than 30 days before the proposed excavation is to be made, such excavator has premarked not more than 500 feet of the proposed excavation and given an initial notice to the system. Such initial notice shall set forth a description of the excavation location in the manner as herein defined. In addition, such initial notice shall indicate whether any such excavation will involve blasting and, if so, the date and the location at which such blasting is to occur.

The notice requirements shall be waived in an emergency as defined herein; provided, however, that before such excavation begins or during a life-threatening emergency, notification shall be given to the system and the initial point of boring or excavation shall be premarked. The excavator shall ensure that the underground facilities of the utilities in the area of such excavation shall not be damaged or jeopardized.

In no event shall any excavation by blasting take place unless notice thereof, either in the initial notice or a subsequent notice accurately specifying the date and location of such blasting shall have been given and received at least 72 hours in advance, except in the case of an unanticipated obstruction requiring blasting when such notice shall be not less than four hours prior to such blasting. If any such notice cannot be given as aforesaid because of an emergency requiring blasting, it shall be given as soon as may be practicable but before any explosives are discharged.

Chapter 82: Section 40B Designation of location of underground facilities

Section 40B. Within 72 hours, exclusive of Saturdays, Sundays and legal holidays, from the time the initial notice is received by the system or at such time as the company and the excavator agree, such company shall respond to the initial notice or subsequent notice by designating the location of the underground facilities within 15 feet in any direction of

the premarking so that the existing facilities are to be found within a safety zone. Such safety zone shall be so designated by the use of standard color-coded markings. The providing of such designation by the company shall constitute prima facie evidence of an exercise of reasonable precaution by the company as required by this section; provided, however, that in the event that the excavator has given notice as aforesaid at a location at which because of the length of excavation the company cannot reasonably designate the entire location of its facilities within such 72 hour period, then such excavator shall identify for the company that portion of the excavation which is to be first made and the company shall designate the location of its facilities in such portion within 72 hours and shall designate the location of its facilities in the remaining portion of the location within a reasonable time thereafter. When an emergency notification has been given to the system, the company shall make every attempt to designate its facilities as promptly as possible.

Chapter 82: Section 40C Excavator's responsibility to maintain designation markings; damage caused by excavator

Section 40C. After a company has designated the location of its facilities at the location in accordance with section 40B, the excavator shall be responsible for maintaining the designation markings at such locations, unless such excavator requests remarking at the location due to the obliteration, destruction or other removal of such markings. The company shall then remark such location within 24 hours following receipt of such request.

When excavating in close proximity to the underground facilities of any company when such facilities are to be exposed, non-mechanical means shall be employed, as necessary, to avoid damage in locating such facility and any further excavation shall be performed employing reasonable precautions to avoid damage to any underground facilities including, but not limited to, any substantial weakening of structural or lateral support of such facilities, penetration or destruction of any pipe, main, wire or conduit or the protective coating thereof, or damage to any pipe, main, wire or conduit.

If any damage to such pipe, main, wire or conduit or its protective coating occurs, the company shall be notified immediately by the excavator responsible for causing such damage.

The making of an excavation without providing the notice required by section 40A with respect to any proposed excavation which results in any damage to a pipe, main, wire or conduit, or its protective coating, shall be prima facie evidence in any legal or administrative proceeding that such damage was caused by the negligence of such person.

Chapter 82: Section 40D Local laws requiring excavation permits; public ways

Section 40D. Nothing in this section shall affect or impair local ordinances or by-laws requiring a permit to be obtained before excavation in a public way or on private property; but notwithstanding any general or special law, ordinance or by-law to the contrary, to the extent that any permit issued under the provisions of the state building code or state fire code requires excavation by an excavator on a public way or on private property, the permit shall not be valid unless the excavator notifies the system as required pursuant to sections 40 and 40A, before the commencement of the excavation, and has complied with the permitting requirements of chapter 82A.

Chapter 82: Section 40D Section 40E Violations of Secs. 40A to 40E; punishment

Section 40E. Any person or company found by the department of telecommunications and energy, after a hearing, to have violated any provision of sections 40A to 40E, inclusive, shall be fined \$1,000 for the first offense and not less than \$5,000 nor more than \$10,000 for any subsequent offense within 12 consecutive months as set forth by the rules of said department; provided, however, that nothing herein shall be construed to require forfeiture of any penal sum by a state or local government body for violation of section 40A or 40C; and provided, further, that nothing herein shall be construed to require the forfeiture of any penal sum by a residential property owner for the failure to premark for an excavation on such person's residential property.

Davis Bacon Act Requirements

All construction projects are subject to the Davis Bacon wage rate requirements and must include the appropriate sections of the following document in its entirety in the contract documents.

The vast majority of SRF projects will be bid by Governmental Entities (i.e., Cities, Towns, Authorities, Water Districts, Wastewater Districts). These projects must include the following language in construction contracts:

- I.3. Contract and Subcontract Provisions
- I.4. Contract Provisions for Contracts in Excess of \$100,000 (if applicable)
- I.5. Compliance Verification

This language may be found on pages DB-3-DB-11.

In certain cases, SRF projects may be bid by non-Governmental Entities (i.e., private water companies, private PWSs, etc.). These projects must include the following language in construction contracts:

- **II.3. Contract and Subcontract Provisions**
- II.4. Contract Provisions for Contracts in Excess of \$100,000 (if applicable)
- II.5. Compliance Verification

This language my be found on pages DB-11-DB-21

Preamble

With respect to the Clean Water and Safe Drinking Water State revolving Funds, EPA provides capitalization grants to each State which in turn provides subgrants or loans to eligible entities within the State. Typically, the subrecipients are municipal or other local governmental entities that manage the funds. For these types of recipients, the provisions set forth under Roman Numeral I, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section 3(ii)(A), below and for compliance as described in Section I-5.

Occasionally, the subrecipient may be a private for profit or not for profit entity. For these types of recipients, the provisions set forth in Roman Numeral II, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section II-3(ii)(A), below and for compliance as described in Section II-5.

I. Requirements For Subrecipients That Are Governmental Entities:

The following terms and conditions specify how recipients will assist EPA in meeting its Davis-Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance with respect to State recipients and subrecipients that are governmental entities. If a subrecipient has

questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient. If a State recipient needs guidance, the recipient may contact Valerie Marshall at EPA Region 1 (617-918-1674) for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at https://www.dol.gov/whd/govcontracts/dbra.htm

1. Applicability of the Davis- Bacon (DB) prevailing wage requirements.

DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

2. Obtaining Wage Determinations.

- (a) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.
 - (i) While the solicitation remains open, the subrecipient shall monitor www.wdol.gov weekly to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.
 - (ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor www.wdol.gov on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.
- (b) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.

- (c) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- (d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

3. Contract and Subcontract provisions.

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2012 Appropriations Act, the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work 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 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.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) 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 shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §5.5(a)(4). 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 classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall 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. Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.

- (ii)(A) The subrecipient(s), on behalf of EPA, shall 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 shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
 - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
 - (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.
 - (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
 - (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall 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.

- (iii) 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 shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) 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, 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.
- (2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, 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.
- (3) Payrolls and basic records.
 - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, 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 section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) 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 section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall 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. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at

https://www.dol.gov/whd/forms/wh347.pdf or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
 - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed 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 Regulations, 29 CFR part 3;
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, 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 may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed 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 Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall 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 the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall 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, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
- (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.
- (6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 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.
- (9) Disputes concerning labor standards. 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 Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.
- (10) Certification of eligibility.
 - (i) By entering into this contract, the contractor certifies that neither it (nor he or she) 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 section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4. Contract Provision for Contracts in Excess of \$100,000.

- (a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any 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 Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen 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.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. 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 watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 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 (a)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or 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, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.
- (b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification

- (a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.
- (b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the subrecipient should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.
- (c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its

assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments thereunder by contractors and subcontractors who claim credit for fringe benefit contributions.

- (d) The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.
- (e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at https://www.dol.gov/whd/whd_district_offices.pdf.

II. Requirements For Subrecipients That Are Not Governmental Entities

The following terms and conditions specify how recipients will assist EPA in meeting its DB responsibilities when DB applies to EPA awards of financial assistance with respect to subrecipients that are not governmental entities. If a subrecipient has questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient for guidance. If a State recipient needs guidance, the recipient may contact Valerie Marshall at EPA Region 1 (617-918-1674) for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at https://www.dol.gov/whd/govcontracts/dbra.htm

Under these terms and conditions, the subrecipient must submit its proposed DB wage determinations to the State recipient for approval prior to including the wage determination in any solicitation, contract task orders, work assignments, or similar instruments to existing contractors.

1. Applicability of the Davis- Bacon (DB) prevailing wage requirements.

DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

2. Obtaining Wage Determinations.

- (a) Subrecipients must obtain proposed wage determinations for specific localities at www.wdol.gov. After the Subrecipient obtains its proposed wage determination, it must submit the wage determination to (insert contact information for State recipient DB point of contact for wage determination) for approval prior to inserting the wage determination into a solicitation, contract or issuing task orders, work assignments or similar instruments to existing contractors (ordering instruments unless subsequently directed otherwise by the State recipient Award Official.
- (b) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.
 - (i) While the solicitation remains open, the subrecipient shall monitor www.wdol.gov. on a weekly basis to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.
 - (ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor www.wdol.gov on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.
- (c) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subecipient shall insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.
- (d) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- (e) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

3. Contract and Subcontract provisions.

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2011 Full-Year Continuing Appropriation, the following clauses:

(1) Minimum wages.

- (i) All laborers and mechanics employed or working upon the site of the work, 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 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. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) 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 shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §5.5(a)(4). 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 classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall 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. Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.
- (ii)(A) The subrecipient(s), on behalf of EPA, shall 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 shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient(s) to the State award official. The State award official will transmit the report, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.
- (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request, and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall 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.
- (iii) 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 shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) 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, 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.

(2) Withholding. The subrecipient(s) shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, 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.

(3) Payrolls and basic records.

- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, 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 section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) 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 section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall 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. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is

available for this purpose from the Wage and Hour Division Web site at https://www.dol.gov/whd/forms/wh347.pdf or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
- (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed 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 Regulations, 29 CFR part 3;
- (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, 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 may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed 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 Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall 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 the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered. the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall 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, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of

fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
- (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.
- (6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 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.
- (9) Disputes concerning labor standards. 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 Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

- (10) Certification of eligibility.
 - (i) By entering into this contract, the contractor certifies that neither it (nor he or she) 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 section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4. Contract Provision for Contracts in Excess of \$100,000.

- (a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any 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 Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen 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.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. 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 watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 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 (b)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The subrecipient shall upon the request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or 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, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(c) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification

- (a). The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.
- (b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the subrecipient should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.
- (c). The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments thereunder by contractors and subcontractors who claim credit for fringe benefit contributions.

- (d). The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.
- (e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at https://www.dol.gov/whd/whd district offices.pdf.

"General Decision Number: MA20240019 01/19/2024

Superseded General Decision Number: MA20230019

State: Massachusetts

Construction Type: Highway

County: Hampden County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:

- . Executive Order 14026 generally applies to the contract.
- . The contractor must pay all covered workers at least \$17.20 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 2024.

If the contract was awarded on |. Executive Order 13658 or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:

- generally applies to the contract.
- . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number Publication Date 0 01/05/2024 1 01/19/2024

* ENGI0004-019 12/01/2023

Rat	es Fringes
POWER EQUIPMENT OPERATOR	
Group 1\$ 48	3.73 29.25+A
GROUP 1\$ 55	32.45
Group 2\$ 48	3.23 29.25+A
GROUP 2\$ 54	32.45

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 12/01/2016

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	\$ 33.68	23.96+A
Group 2	\$ 33.37	23.96+A
Group 4	\$ 32.54	23.96+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 09/16/2023

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND		
STRUCTURAL)	\$ 39.05	32.42

LABO0596-006 12/01/2021

	Rates	Fringes
LABORER (Traffic Control: Flagger)	.\$ 24.50	23.96
LABO0999-002 12/01/2021		
	Rates	Fringes
LABORER (Common or General)		23.96
PAIN0035-023 07/01/2023		
	Rates	Fringes
PAINTER (Steel)		35.10
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		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.

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 classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which 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. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of 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. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

- 1.) Has there been an initial decision in the matter? This can be:
- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour

National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write 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 the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write 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 by 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

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION"

AMERICAN IRON AND STEET REQUIREMENTS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, D.C. 20460

MAR 2 0 2014

DEFICE OF WATER

MEMORANDUM

SUBJECT:

Implementation of American Iron and Steel provisions of P.I. 113-76,

Consolidated Appropriations Act, 2014

FROM:

Andrew D. Sawvers, Director

Office of Wastewater Management (4201M)

Peter C. Grevatt, Director

Office of Ground Water and Drinking Water (4601M)

TO:

Water Management Division Directors

Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel (AIS)" requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (ensetment of the Act), through the end of Federal Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering plans and specifications were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

Implementation

The Act states:

Sec. 436 (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j–12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

- (2) In this section, the term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.
- (b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the "Administrator") finds that—
 - (1) applying subsection (a) would be inconsistent with the public interest;
 - (2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
 - (3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.
- (c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.
- (d) This section shall be applied in a manner consistent with United States obligations under international agreements.
- (e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency's capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

Project Coverage

1) What classes of projects are covered by the AIS requirement?

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Federal Fiscal Year 2014, are covered. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

2) Does the AIS requirement apply to nonpoint source projects or national estuary projects?

No. Congress did not include an AIS requirement for nonpoint source and national estuary projects unless the project can also be classified as a 'treatment works' as defined by section 212 of the Clean Water Act.

3) Are any projects for the construction, alteration, maintenance, or repair of a public water system or treatment works excluded from the AIS requirement?

Any project, whether a treatment works project or a public water system project, for which engineering plans and specifications were approved by the responsible state agency prior to January 17, 2014, is excluded from the AIS requirements.

4) What if the project does not have approved engineering plans and specifications but has signed an assistance agreement with a CWSRF or DWSRF program prior to January 17, 2014?

The AIS requirements do not apply to any project for which an assistance agreement was signed prior to January 17, 2014.

5) What if the project does not have approved engineering plans and specifications, but bids were advertised prior to January 17, 2014 and an assistance agreement was signed after January 17, 2014?

If the project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the approval date for purposes of the exemption in section 436(f).

6) What if the assistance agreement that was signed prior to January 17, 2014, only funded a part of the overall project, where the remainder of the project will be funded later with another SRF loan?

If the original assistance agreement funded any construction of the project, the date of the original assistance agreement counts for purposes of the exemption. If the original assistance agreement was only for planning and design, the date of that assistance agreement will count for purposes of the exemption only if there is a written commitment or expectation on the part of the assistance recipient to fund the remainder of the project with SRF funds.

7) What if the assistance agreement that was signed prior to January 17, 2014, funded the first phase of a multi-phase project, where the remaining phases will be funded by SRF assistance in the future?

In such a case, the phases of the project will be considered a single project if all construction necessary to complete the building or work, regardless of the number of contracts or assistance agreements involved, are closely related in purpose, time and place. However, there are many situations in which major construction activities are clearly undertaken in phases that are distinct in purpose, time, or place. In the case of distinct phases, projects with engineering plans and specifications approval or assistance agreements signed prior to January 17, 2014 would be excluded from AIS requirements while those approved/signed on January 17, 2014, or later would be covered by the AIS requirements.

8) What if a project has split funding from a non-SRF source?

Many States intend to fund projects with "split" funding, from the SRF program and from State or other programs. Based on the Act language in section 436, which requires that American iron and steel products be used in any project for the construction, alteration, maintenance, or repair of a public water system or treatment works receiving SRF funding between and including January 17, 2014 and September 30, 2014, any project that is funded in whole or in part with such funds must comply with the AIS requirement. A "project" consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all contracts and assistance agreements awarded are closely related in purpose, time and place. This precludes the intentional splitting of SRF projects into separate and smaller contracts or assistance agreements to avoid AIS coverage on some portion of a larger project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreement for SRF and State or other funding would carry separate requirements.

9) What about refinancing?

If a project began construction, financed from a non-SRF source, prior to January 17, 2014, but is refinanced through an SRF assistance agreement executed on or after January 17, 2014 and prior to October 1, 2014, AIS requirements will apply to all construction that occurs on or after January 17, 2014, through completion of construction, unless, as is likely, engineering plans and specifications were approved by a responsible state agency prior to January 17, 2014. There is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to January 17, 2014.

10) Do the AIS requirements apply to any other EPA programs, besides the SRF program, such as the Tribal Set-aside grants or grants to the Territories and DC?

No, the AIS requirement only applies to funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j–12)

Covered Iron and Steel Products

11) What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

Lined or unlined pipes or fittings;

Manhole Covers;

Municipal Castings (defined in more detail below);

Hydrants;

Tanks;

Flanges;

Pipe clamps and restraints;

Valves:

Structural steel (defined in more detail below);

Reinforced precast concrete; and

Construction materials (defined in more detail below).

12) What does the term 'primarily iron or steel' mean?

'Primarily iron or steel' places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

13) Can you provide an example of how to perform a cost determination?

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

14) If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

15) What is the definition of steel?

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

16) What does 'produced in the United States' mean?

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

17) Are the raw materials used in the production of iron or steel required to come from US sources?

No. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

18) If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

19) What is the definition of 'municipal castings'?

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

Access Hatches:

Ballast Screen;

Benches (Iron or Steel);

Bollards:

Cast Bases:

Cast Iron Hinged Hatches, Square and Rectangular;

Cast Iron Riser Rings;

Catch Basin Inlet;

Cleanout/Monument Boxes:

Construction Covers and Frames;

Curb and Corner Guards:

Curb Openings;

Detectable Warning Plates;

Downspout Shoes (Boot, Inlet);

Drainage Grates, Frames and Curb Inlets;

Inlets:

Junction Boxes;

Lampposts:

Manhole Covers, Rings and Frames, Risers:

Meter Boxes:

Service Boxes:

Steel Hinged Hatches, Square and Rectangular;

Steel Riser Rings;

Trash receptacles;

Tree Grates:

Tree Guards; Trench Grates; and Valve Boxes, Covers and Risers.

20) What is 'structural steel'?

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

21) What is a 'construction material' for purposes of the AIS requirement?

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered "structural steel". This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

22) What is not considered a 'construction material' for purposes of the AIS requirement?

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

23) If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

24) What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the US.

Compliance

25) How should an assistance recipient document compliance with the AIS requirement?

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements. Sample language for assistance agreements and contracts can be found in Appendix 3 and 4.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to the AIS requirement and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer, processor, etc) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Appendix 5, are sample certifications. These certifications should be collected and maintained by assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

26) How should a State ensure assistance recipients are complying with the AIS requirement?

In order to ensure compliance with the AIS requirement, States SRF programs must include specific AIS contract language in the assistance agreement. Sample language for assistance agreements can be found in Appendix 3.

States should also, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

27) What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?

If a potentially non-compliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of the non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations, in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-888-546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: http://oig.hhs.gov/fraud/report-fraud/

28) How do international trade agreements affect the implementation of the AIS requirements?

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF

assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

Waiver Process

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States, on behalf of the assistance recipients, to apply for waivers of the AIS requirement directly to EPA Headquarters. Only waiver requests received from states will be considered. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

Definitions

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

<u>Reasonably Available Quantity</u>: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

<u>Satisfactory Quality</u>: The quality of iron or steel products, as specified in the project plans and designs.

<u>Assistance Recipient</u>: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

Step-By-Step Waiver Process

Application by Assistance Recipient

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.

The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 3 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three conditions is met:

- 1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
- 2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
- 3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Appendix 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF program. It is strongly recommended that the State designate a single person for all AIS communications. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to either of two email addresses. For CWSRF waiver requests, please send the application to: cwsrfwaiver@epa.gov. For DWSRF waiver requests, please send the application to: dwsrfwaiver@epa.gov.

Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a three-step process:

- 1. Posting After receiving an application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA's website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: http://water.epa.gov/grants_funding/aisrequirement.cfm
- 2. Evaluation After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver that it is quantitatively and qualitatively sufficient and to determine whether or not to grant the waiver.
- 3. Signature of waiver approval by the Administrator or another agency official with delegated authority As soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take more time than other waiver requests for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (US geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public's interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at dorfman.jordan@epa.gov or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Attachments

Attachment 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	>	Notes
General • Waiver request includes the following information: — Description of the foreign and domestic construction materials — Unit of measure — Quantity — Price		
 Time of delivery or availability Location of the construction project Name and address of the proposed supplier A detailed justification for the use of foreign construction materials Waiver request was submitted according to the instructions in the memorandum Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor 		
Variver Requests Waiver request includes the following information: Waiver request includes the following information: Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products Relevant excerpts from the bid documents used by the contractors to complete the comparison Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers		8.1
Availability Waiver Requests • Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested: — Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials — Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers.		
Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials • Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought • Has the State received other waiver requests for the materials described in this waiver request, for comparable projects?		

Attachment 2: HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.

2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

	Review Items	Yes	No	N/A	Comments	
Ŭ.	Cost Waiver Requests • Does the waiver request include the following information? — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with					
	foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — A sufficient number of bid documents or pricing information from domestic sources to constitute a					
•	reasonable survey of the market Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%?					
⋖ .	Availability Waiver Requests					
	quality of the iron and/or steel product for which the waiver is requested? — Supplier information or other documentation indicating availability/delivery date for materials					
	 Project schedule Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials 					4-727
•	Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted				93	
•	Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic					
•	delivery quote date or other relevant information) Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested?			-		1
	Examples include: — Multiple waiver requests for the materials described in this waiver request, for comparable projects in the					
	Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States					
•	 Correspondence with construction trade associations indicating the non-availability of the materials Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits? 		1			

Attachment 3: Example Loan Agreement Language

ALL ASSISTANCE AGREEMENT MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN SRF ASSISTANCE AGREEMENTS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE LAW:

Comply with all federal requirements applicable to the Loan (including those imposed by the 2014 Appropriations Act and related SRF Policy Guidelines) which the Participant understands includes, among other, requirements that all of the iron and steel products used in the Project are to be produced in the United States ("American Iron and Steel Requirement") unless (i) the Participant has requested and obtained a waiver from the Agency pertaining to the Project or (ii) the Finance Authority has otherwise advised the Participant in writing that the American Iron and Steel Requirement is not applicable to the Project.

Comply with all record keeping and reporting requirements under the Clean Water Act/Safe Drinking Water Act, including any reports required by a Federal agency or the Finance Authority such as performance indicators of program deliverables, information on costs and project progress. The Participant understands that (i) each contract and subcontract related to the Project is subject to audit by appropriate federal and state entities and (ii) failure to comply with the Clean Water Act/Safe Drinking Water Act and this Agreement may be a default hereunder that results in a repayment of the Loan in advance of the maturity of the Bonds and/or other remedial actions.

Attachment 4: Sample Construction Contract Language

ALL CONTRACTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN ALL CONTRACTS IN PROJECTS THAT USE SRF FUNDS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE OR LOCAL LAW:

The Contractor acknowledges to and for the benefit of the City of _____("Purchaser") and (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Attachment 5: Sample Certification 1

The following information is provided as a sample letter of step certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

- 1. Xxxx
- 2. Xxxx
- 3. Xxxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

Attachment 5: Sample Certification 2

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

- 1. Xxxx
- 2. Xxxx
- 3. Xxxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

WIFIA SPECIFICATION PACKAGE AND BID CONTRACT LANGUAGE

Last Updated: December 2020

The is a reference document that provides all necessary contract language for WIFIA funded projects. Please note that some of the contract language in this package is required and must be included verbatim and some is suggested. For *Suggested Contract Language*, you may use your own language so long as it still ensures that provisions are included to guarantee compliance with the federal requirements.

EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THE FEDERAL LANGUAGE PROVISIONS WITH RESPECT TO STATE OR LOCAL LAW.

ECONOMIC AND MISCELLANEOUS AUTHORITIES

DEBARMENT AND SUSPENSION AND PROHIBITIONS RELATING TO VIOLATIONS OF CWA AND CAA WITH RESPECT TO FEDERAL CONTRACTS, GRANTS, OR LOANS

Suggested Contract Language:

Debarment and Suspension. Contractor certifies that it will not knowingly enter into a contract with anyone who is ineligible under the 2 CFR part 180 and part 1532 (per Executive Order 12549, 51 FR 6370, February 21, 1986) or who is prohibited under Section 306 of the Clean Air Act or Section 508 of the Clean Water Act to participate in the [Project]. Suspension and debarment information can be accessed at http://www.sam.gov. Contractor represents and warrants that it has or will include a term or conditions requiring compliance with this provision in all of its subcontracts under this Agreement.

NEW RESTRICTIONS ON LOBBYING

Suggested Contract Language:

Federal Lobbying Restrictions (31 U.S.C 1352). Recipients of federal financial assistance may not pay any person for influencing or attempting to influence any officer or employee of a federal agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress with respect to the award, continuation, renewal, amendment, or modification of a federal grant, loan, or contract. These requirements are implemented for USEPA in 40 CFR Part 34, which also describes types of activities, such as legislative liaison activities and professional and technical services, which are not subject to this prohibition. Upon award of this contract, Contractor shall complete and submit to the City the certification and disclosure forms in Appendix A and Appendix B to 40 CFR Part 34. Contractor shall also require all subcontractors and suppliers of any tier awarded a subcontract over \$100,000 to similarly complete and submit the certification and disclosure forms pursuant to the process set forth in 40 CFR 34.110.



CIVIL RIGHTS, NONDISCRIMINATION, AND EQUAL EMPLOYMENT OPPORTUNITY AUTHORITIES

AGE DISCRIMINATION ACT, SECTION 504 OF THE REHABILITATION ACT, TITLE VI OF THE CIVIL RIGHTS ACT OF 1964, AND SECTION 13 OF THE CLEAN WATER ACT

Suggested Contract Language:

CIVIL RIGHTS OBLIGATIONS. Contractor shall comply with the following federal non-discrimination requirements:

- a. Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, and national origin, including limited English proficiency (LEP). (42 U.S.C 2000D, et. seq)
- b. Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination against persons with disabilities. (29 U.S.C. 794, supplemented by EO 11914, 41 FR 17871, April 29, 1976 and EO 11250, 30 FR 13003, October 13, 1965)
- c. The Age Discrimination Act of 1975, which prohibits age discrimination. (42 U.S.C 6101 et. seq)
- d. Section 13 of the Federal Water Pollution Control Act Amendments of 1972, which prohibits discrimination on the basis of sex.
- e. 40 CFR Part 7, as it relates to the foregoing.

EQUAL EMPLOYMENT OPPORTUNITY

<u>Required</u> Contract Language. This language must be included verbatim:

Equal Employment Opportunity (EEO). The Contractor shall comply with Executive Order 11246, entitled 'Equal Employment Opportunity,' as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60). (EO 11246, 30 FR 12319, September 28, 1965)

Contractor's compliance with Executive order 11246 shall be based on implementation of the Equal Opportunity Clause, and specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4.

During the performance of this contract, the contractor agrees as follows:

1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: 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. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices



- to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
- 2) The contractor will, in all solicitations or advancements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- 3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- 4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- 5) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- 6) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- 8) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States. [Sec. 202 amended by EO 11375 of Oct. 13, 1967, 32 FR 14303, 3 CFR, 1966–1970 Comp., p. 684, EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp.,



p. 230, EO 13665 of April 8, 2014, 79 FR 20749, EO 13672 of July 21, 2014, 79 FR 42971

Standard Federal Equal Employment Opportunity Construction Contract Specifications. (41 CFR 60-4.3)

- 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:
 - 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 these 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 7 a 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. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area



- where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting 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 in 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 onsite 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.
- I) 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 non-segregated except that separate or singleuser 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 supervisors' 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 workforce 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 or affirmative action standards to discriminate against any person because of race, color, religion, sex, sexual orientation, gender identity, 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 may be required by the Government and to 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).

Segregated Facilities. (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 ensuring that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. This obligation extends to all contracts containing the equal opportunity clause regardless of the amount of the contract. The term "facilities," as used in this section, means waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, wash rooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees; Provided, That separate or single-user restrooms and necessary dressing or sleeping areas shall be provided to assure privacy between the sexes.

Required language in bid solicitations (or equivalent):

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246) located at 41 CFR § 60-4.2:

- 1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
- 2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for minority participation for each trade	Goals for female participation in each trade
	Insert goals for each year ¹	6.9%²

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work

² Nationwide goal for all covered areas



¹ Goals can be found at: https://www.dol.gov/agencies/ofccp/construction

in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR part 60-4. Compliance with the goals will be measured against the total work hours performed.

- 3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
- 4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).

PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES IN PROCUREMENT UNDER EPA FINANCIAL ASSISTANCE AGREEMENTS

Note: The WIFIA program only requires use of the EPA DBE program's six good faith efforts during contract procurement. States may require additional DBE reporting.

Suggested Contract Language:

Disadvantaged Business Enterprises (DBE). The contractor must ensure that the DBE's six good faith efforts are used during the procurement of subcontractors for the [Project]. The six good faith efforts are found at: https://www.epa.gov/grants/disadvantaged-business-enterprise-program-requirements#sixgoodfaithefforts.



AMERICAN IRON AND STEEL (AIS) REQUIREMENT

Suggested Contract Language:

The Contractor acknowledges to and for the benefit of _____ ("Purchaser") and the United States Environmental Protection Agency ("EPA") that it understands the goods and services under this Agreement are being funded with monies made available by the Water Infrastructure Finance and Innovation Act program of the EPA that has statutory requirements commonly known as "American Iron and Steel" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents, warrants and covenants to and for the benefit of the Purchaser and the EPA that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the EPA. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or the EPA to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or the EPA resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the EPA or any damages owed to the EPA by the Purchaser). While the Contractor has no direct contractual privity with the EPA, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the EPA is a thirdparty beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the EPA.



LABOR LAWS AND STANDARDS

Note that the language below addresses Davis Bacon and Related Acts and incorporates the WIFIA borrower as an authorized representative, in accordance with the WIFIA loan agreement, to ensure compliance with this federal requirement.

Required Contract Language.

Compliance with Davis-Bacon and Related Acts.

- (a) In any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in 29 C.F.R. § 5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, provided that such modifications are first approved by the Department of Labor):
 - (1) Minimum wages.
 - (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), 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 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. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) 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 shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). 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 classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall 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.

(ii)

- (A) The WIFIA assistance recipient, [name of WIFIA borrower], on behalf of the U.S. Environmental Protection Agency (EPA), shall 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 shall be classified in conformance with the wage determination. The WIFIA assistance recipient shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
 - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the WIFIA assistance recipient agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent to the Administrator of the Wage and Hour Division (WHD Administrator), U.S. Department of Labor, Washington, DC 20210. The WHD Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the WIFIA assistance recipient or will notify the WIFIA assistance recipient within the 30-day period that additional time is necessary.
- (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the WIFIA assistance recipient do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the WIFIA assistance recipient shall refer the questions, including the views of all interested parties and the recommendation of the WIFIA assistance recipient, to the WHD Administrator for determination. The WHD Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the WIFIA assistance recipient or will notify the WIFIA assistance recipient within the 30-day period that additional time is necessary.
- (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall 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.
- (iii) 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 shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) 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, 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.
- (2) Withholding. [name of WIFIA borrower], shall upon written request of the WIFIA Director or an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the WIFIA Director may, after written notice to the contractor, sponsor, applicant, or owner, 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.
- (3) Payrolls and basic records.
 - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, 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 section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) 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 section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall 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. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
 - (ii) {no text here}



- (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to [name of WIFIA borrower] . The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage Division and Hour at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to [name of WIFIA borrower], for transmission to the EPA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to [name of WIFIA borrower]).
- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
 - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed 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 Regulations, 29 CFR part 3;
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of [name of the borrower, EPA, or the Department of Labor, and shall permit such



representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the EPA may, after written notice to the [name of WIFIA borrower], 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 may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees -

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed 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 Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall 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 the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall 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 WHD Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to



and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the WHD Administrator determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
- (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.
- (6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 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.
- (9) Disputes concerning labor standards. 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 [name of WIFIA borrower], EPA, the U.S.



Department of Labor, or the employees or their representatives.

(10)Certification of eligibility.

- (i) By entering into this contract, the contractor certifies that neither it (nor he or she) 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 section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.
- (b) Contract Work Hours and Safety Standards Act. The following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section shall be inserted in full in any 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 § 5.5(a) or § 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.
 - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the conract 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.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. 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 watchmen and guards, employed in violation of the clause set forth inparagraph (b)(1) of this section, in the sum of \$25 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 (b)(1) of this section.
 - (3) Withholding for unpaid wages and liquidated damages. The [name of WIFIA borrower] shall upon its own action or upon written request of an authorized representative of the Department of Labor, or the EPA, withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or 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, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
 - (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors



- to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.
- (c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in § 5.1, the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contractfor all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the EPA shall cause or require the [name of WIFIA borrower] to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the [name of WIFIA borrower], EPA and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.



LATEST UPDATES ON FEDERAL REQUIREMENTS

PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

Suggested Contract Language:

Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment (Effective August 13, 2020). The John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232), at Section 889, prohibits EPA financial assistance recipients, including WIFIA borrowers, from expending loan funds to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in the Act, "covered telecommunications equipment or services" means:

- a) Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- b) 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).
- c) Telecommunications or video surveillance services provided by such entities or using such equipment.
- d) 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.

The Act does not prohibit:

- a) Procuring with an entity to provide a service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements.
- b) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.



DOCUMENT 00811 SPECIAL PROVISIONS MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES ENGLISH UNITS

Revised: 02/02/2009

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.

The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment 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 at the time of bid by the Department by using the same method as for the determination of the Period Price detailed below.

Period Price

Please note that, starting December 15, 2008, two sets of period prices will be posted each month on the MassHighway website at http://www.mhd.state.ma.us/. They will be labeled "New Asphalt Period Price Method" and "Old Asphalt Period Price Method".

New Asphalt Period Price Method

The "New Asphalt Period Price Method" is for contracts bid after December 15, 2008 and will show the Period Price of liquid asphalt for each monthly period as determined by MassHighway 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. MassHighway will post this Period Price on this website within two (2) business days following their receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted MassHighway the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

Old Asphalt Period Price Method

The "Old Asphalt Period Price Method" Period Price will be for contracts bid on or before December 15, 2008 and will contain liquid asphalt prices as determined by the old or previous method. These prices will continue to be posted on MassHighway's website until all contracts using the "Old Asphalt Period Price Method" Period Price have been closed.

New and Old Asphalt Period Price Methods

The paragraphs below apply to both the New and the Old Asphalt Period Price Methods.

The Contract Price of the hot mix asphalt mixture 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 virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of tons of hot mix asphalt mixtures placed during each monthly period times the liquid asphalt content percentage times the variance in price between Base Price and Period Price of liquid asphalt.

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.		

***** END OF DOCUMENT ******

DOCUMENT 00812

SPECIAL PROVISIONS MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE – ENGLISH UNITS

Revised: 01/26/2009

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 (www.mhd.state.ma.us) 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	

****** END OF DOCUMENT ******

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 MassHighway 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.

<u>SECTION 01010</u>

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Location: The Work locations include, but are not limited to, locations within the right-of-ways on the following streets and easements in the City of Springfield, Massachusetts.
 - 1. Liberty Street Main Street to Dwight Street (final completion in 2024)
 - 2. Westford Circle Westford Avenue to Norfolk Street (final completion in 2025).
- B. Work Included: The Work includes, but is not limited to, the following:
 - 1. New Water System:
 - a. Water main, valves and hydrants
 - b. Water services
 - c. Disinfection of water mains and appurtenances
 - d. Removal and disposal or abandonment of existing water main, valves and services.
 - e. Temporary water service system and services
 - 2. Testing of water mains and valves for proper installation and performance.
 - 3. Connections to existing water mains.
 - 4. All related site work including trench excavation, ledge excavation, groundwater dewatering, disposal of excess excavated materials, filter fabric, bedding, backfill, compaction, road/drive subbase, paving, loam/seed and landscaping.
 - 5. Other miscellaneous work shown in the Specifications for a complete and operational system.
- C. Related Work Specified Elsewhere
 - 1. General requirements are specified in Division 1.

Site work, piping, structures, testing requirements, etc. are specified in Divisions 2 and 3, and the Springfield Water and Sewer Commission – Guidelines and Policies – Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020, Springfield Water and Sewer Commission – Material Specifications – Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020, Springfield Water and Sewer Commission – Standard Details - Liberty Street and Westford Circle Water Main Replacement Project Version 4 – August 12, 2021, City of Springfield – Manual for Occupancy of Public and Private Ways within the City of Springfield – June 5, 2017.

- 2. Removals, Relocations and Rearrangements
- 3. Examine the existing site for the work of all trades which will influence the cost of the work under the bid. This work shall include removals, relocations and rearrangements which may interfere with, disturb or complicate the performance of the work under the general bid involving systems, equipment

- and related service lines, which shall continue to be utilized as part of the finished project. The Contractor is responsible for all coordination in this regard.
- 4. Provide in the bid a sufficient amount to include all removals, relocations, rearrangements and reconnections herein specified, necessary or required to provide approved operation and coordination of the combined new and existing systems and equipment.
- 5. Provide in the bid a sufficient amount to include all temporary facilities required to maintain flows during the construction period, including temporary piping, temporary metering, etc. The cost shall include the cost for all labor, tools, equipment and materials necessary.

1.2 STANDARDS

- A. If there are any conflict between requirements found in these specifications and requirements found in the Springfield Water and Sewer Commission referenced below, the Owner and Engineer shall be notified of the conflict and either the Owner or Engineer will provide written direction concerning the conflict:
 - 1. Springfield Water and Sewer Commission Guidelines and Polices Water Infrastructure Improvements Liberty Street and Westford Circle
 - 2. Springfield Water and Sewer Commission Material Specifications *Water Infrastructure Improvements Liberty Street and Westford Circle*
 - 3. Springfield Water and Sewer Commission Guidelines and Policies *Detail Drawings*
 - 4. Springfield Department of Public Works Standard Engineering Details as provided in the Appendices.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 <u>MAINTAIN EXISTING WORKS</u>

- A. Continuous Operations Criteria:
 - 1. The Contractor shall conduct operations in such a manner and sequence which shall neither result in a disruption of, nor interfere with, the functional workings of any existing utilities.
 - 2. The Owner will operate and maintain all existing systems and equipment not modified or impacted by the project. The Contractor shall notify and coordinate with the Owner whenever Contractor's temporary facilities or construction will interface with existing utilities.
 - 3. The Contractor shall be responsible for the operation and maintenance of all new and temporary facilities until such time as the new facilities are accepted by the Owner.
 - 4. Only the Owner's operations staff may operate existing water main valves. Valves and hydrants installed as part of the project as well as existing hydrants

- may be operated by the Contractor only with the Owner's and/or Engineer's authorization and supervision.
- 5. The Contractor will be responsible for performing all required taps with Owner and/or Engineer's authorization and supervision.

B. Minimize Interference

- 1. The Contractor shall at all times conduct operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted
- 2. Work of connecting with, cutting into and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time and when the demands on the facilities best permit such interference. It may be necessary to work outside of normal working hours to minimize interference. Before starting work which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

3.2 CONSTRUCTION SEQUENCE

- A. Construction of the proposed facilities will disrupt the existing structures and operations. To maintain continuous operations, the construction must be divided into phases or sequenced appropriately.
- B. The Contractor shall submit to the Engineer for review and acceptance a complete schedule of the proposed sequence of construction operations prior to commencing any work. This schedule shall include the Contractor's plans for doing the work.
- C. The Contractor shall submit to the Engineer a written request to deviate from the above sequence with adequate supporting information to demonstrate to the Engineer that the continuity and degree of treatment will not be adversely affected.
- D. All proposed water main connections to the existing water distribution system shall be made during typical construction hours. Each connection must be completed and the existing water main put back in service the same day. Water main and water service shutdowns to facilitate the proposed connections will be performed by the SWSC and scheduled between 8:00 am and 3:30 pm during regular business days. Water main shutdowns affecting businesses, institutional buildings, and medical facilities may require water main shutdowns for proposed connections to occur outside of the typical hours. See the Appendices for a schedule of valve operation and water main shutdowns by SWSC.
- E. Suggested Sequence of Work (Liberty Street):
 - 1. Install the tapping sleeves and valves in both the intersection with Main Street and Dwight Street.
 - 2. Visually inspect new tapping sleeves for leaks
 - 3. Install the proposed 8-inch water main between the tapping sleeves and valves.
 - 4. Flush, test, disinfect, and sample the newly installed water main
 - 5. Install the water services

- 6. During one typical water main shutdown period the contactor shall excavate to install the pipe to discontinue the connection of the old pipe to the 16-inch main in Main Street.
- 7. Visually inspect new straight pipe segment and couplings for leaks
- 8. During one typical water main shutdown period the contactor shall excavate to install the tee to discontinue the connection of the old pipe to the 10-inch main in Dwight Street.
- 9. Visually inspect new tee and couplings for leaks
- 10. Final paving and restoration/cleanup
- F. Suggested Sequence of Work (Westford Circle):
 - 1. During a typical one-day shutdown period the Contractor shall install the new gate valves to the south on Wellington (20' south of station 13+80) and to the north on Wellington (20' north of Station 14+45). These valves shall remain shut.
 - 2. During a typical one-day shutdown period the Contractor shall install the 6" tap and sleeve, gate valves, reducers and air valve assemblies at station 0+00 in Westford Avenue.
 - 3. During a typical one-day shutdown period the Contractor shall cut and cap the existing water main near station 2+75 and brace the new cap per the details.
 - 4. Contractor to install water main from the gate valve at station 0+05 to the existing valve (to be shut) at station 2+90.
 - 5. Test and disinfect from 0+05 to 2+90 and place the main into service, and transfer services onto new main.
 - 6. Once services have been transferred to the new main from 0+00 to 2+90, during a typical one-day shutdown period the Contractor shall install the straight section of pipe on Westford Avenue to remove the existing 6"x6" for the now abandoned 6" water main along Westford Circle.
 - 7. Contractor to install water main from existing valve at station 3+70 to station 13+50 including:
 - a. Install 8"x8" cross, 80 LF of 8" pipe (running north south), gate valves and offsets over existing pipe as needed in Dunmoreland Street
 - b. Install 8"x8" cross, 90 LF of 8" pipe (running north south), gate valves and offsets over existing pipe as needed in Albermarle Street
 - c. Install 8"x8" cross, 60 LF of 8" pipe (running north south), gate valves and offsets over existing pipe as needed in Braddock Street
 - 8. Test and disinfect the new main, and then transfer services from 3+70 to 13+50 to the new main.
 - 9. Once services have been transferred to the new main from 3+70 to 13+50, during typical one-day shutdowns period the Contractor shall make the connections to the new main and cap the abandoned existing mains at Dunemoreland, Albermalre and Braddock.
 - 10. Contractor to continue pipe installation from 13+50 proceeding eastward.
 - 11. During a typical one-day shutdown period the Contractor shall install the piping for the connection to Wellington Steet (south) from 8" tee to the previously installed closed valve, to remain closed.

- 12. During a typical one-day shutdown period the Contractor shall install the piping for the connection to Wellington Steet (north) from 8" tee to the previously installed closed valve, to remain closed.
- 13. Test and disinfect the new main, and then transfer services from 13+50 to 16+40 to the new main.
- 14. Test and disinfect the new main, and then transfer services from 13+50 to 16+40 the new main.
- 15. During a typical one-day shutdown period the Contractor shall install the 8" x 8" cross, gate valves and air valve assemblies at the intersection with Middlesex Street.
- 16. Continue installation from 16+40 heading to the east to the newly installed valve at Middlesex Street.
- 17. During a typical one-day shutdown period the Contractor shall cut and cap the existing water main near station 17+10 and brace the new cap per the details.
- 18. During a typical one-day shutdown period the Contractor shall cut and cap the existing water main at station 21+45 and brace the new caps per the details.
- 19. Continue installation from 17+00 to the existing valve at 21+55 including the section to the gate valve to the north on Suffolk Street.
- 20. Test and disinfect the new main, and then transfer services from 17+00 to 21+55 to the new main.
- 21. During a typical one-day shutdown period the Contractor shall make the connection from the new gate valve in the intersection with Suffolk Street to the existing water main from the north on Suffolk Street.
- 22. During a typical one-day shutdown period the Contractor shall cut and cap the existing water main at station 22+75 and brace the new caps per the details.
- 23. Continue installation from 22+50 to the new valve at 24+90.
- 24. Test and disinfect the new main from 22+75 to 24+90 to the new main.
- 25. During a typical one-day shutdown period the Contractor shall install the 8" by 8" tee, gate valves, and straight section of pipe to abandon the old Tee in the intersection of Westford Circle and Norfolk Street.

3.3 SCHEDULE LIMITATIONS AND WORK RESTRICTIONS/ REQUIREMENTS

A. Work Hours:

- 1. Work hours are defined in the General Conditions.
- 2. Coordinate this work with the Owner and all utilities.
- 3. The Contractor shall request permission to work outside the work hours specified above at least 72-hours in advance of the proposed work. The Contractor shall not commence work outside of the work hours specified above unless or until granted such permission from the Owner and Engineer.
- B. Temporary Facilities Plan:
 - 1. A project Temporary Facilities Plan shall be submitted prior to the Pre-Construction Meeting. The Temporary Facilities Plan shall identify the approach for maintaining continuous operations for each impacted utility.
- C. Maintain Services:
 - 1. Maintain all existing water and sanitary sewer services.
- D. Traffic Control Plan:

- 1. A project-specific Traffic Control Plan shall be developed in conjunction with the Traffic Management Plans in the drawings. The Traffic Control Plan shall be submitted to Owner, Engineer, and the Springfield Department of Public Works (DPW) a minimum of 2 weeks in advance of any activity at the project site (refer to Section 01570).
- 2. The Springfield DPW will review each site-specific Traffic Control Plan concurrently with the Contractor's application for a street occupancy or excavation permit. Permit approval is contingent on the DPW's approval of the Traffic Control Plan.
- 3. Contractor shall provide a minimum of one lane for the passage of traffic within any work zone unless approved by the Springfield DPW permit and Owner.
- 4. Contractor shall maintain access to all residences and businesses at all times.
- 5. Contractor shall maintain access for garbage collection and mail services to all residences and businesses at all times. Contractor shall coordinate with these service providers.
- 6. Contractor shall maintain access for bus routes, schools, day care facilities, etc. at all times. Contractor shall coordinate efforts with local school district to ensure access.
- E. Pavement Maintenance and Winter Shutdown Period:
 - 1. The Contractor shall maintain pipe trenches with compacted gravel until pavement operations can be completed.
 - 2. Temporary paving must be installed at the end of each work week..
 - 3. No excavation in paved roadways shall be allowed after November 15.
 - 4. All streets shall be paved prior to any "winter shutdown period", which is defined as December 1st to April 1st. Any temporary pavement placed prior to winter shutdown shall be removed during the following construction season. The substantial completion time and the contract completion dates (or days) include the noted "winter shutdown period".

END OF SECTION

SECTION 01050

COORDINATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Contractor is required to work in close proximity to Owner's and the Public's existing facilities. The Contractor, under this Contract, will be responsible for coordinating construction activities with Owner to ensure that services, facilities, and safe working conditions are maintained.
- B. Any damage to existing structures, equipment and property, accepted equipment or structures, and property or work in progress by others; as a result of the Contractor's or their subcontractor's operations shall be made good by the Contractor at no additional cost to the Owner.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 COORDINATION WITH OTHERS

- A. City of Springfield:
 - 1. Contractor shall coordinate access, egress, detours and traffic control, if required, at each site with the Springfield DPW and the Springfield Police Department. The Contractor shall notify Springfield Police, Fire Department and Rescue Squad at least 2 weeks in advance of any street closings or detours.
 - 2. Contractor shall coordinate all work on City property with SWSC and Springfield DPW.
 - 3. The Contractor shall be responsible for coordinating and maintaining access and public services to all public and private properties.
- B. Springfield Water and Sewer Commission (SWSC)
 - Contractor shall be responsible for coordinating all work in the vicinity of water and sewer lines with the SWSC. Contractor shall bear all costs for the SWSC's inspection requirements, temporary facilities, water main adjustments and other requirements.

C. Eversource Electric West:

1. The Contractor shall be responsible for coordinating all work around Eversource facilities with Eversource and shall bear all costs of inspection requirements, temporary facilities relocation and other requirements. The Contractor is required to notify Eversource at least 72 business hours in advance of any Eversource duct banks being exposed. Eversource will inspect the duct banks once exposed and oversee the handling of their infrastructure.

D. Verizon:

1. The Contractor shall be responsible for coordinating and providing telephone service to all construction sites, both temporary and permanent. The Contractor shall also be responsible for coordinating all work around Verizon facilities

with Verizon and shall bear all costs of inspection requirements, temporary facilities relocation and all other requirements.

- E. The Contractor shall provide the Resident Project Representative and Owner a construction schedule indicating the times to perform the work required. The Contractor shall update the schedule when required and give the facility one week notice before the start of any work. The Contractor shall provide the facility personnel enough time to obtain materials and perform the work required of them. The Contractor shall daily communicate with the Resident Project Representative and Owner concerning updating the schedule, job progress, delay or early starts that affect the treatment process, facility staffing, etc.
- F. Bi-Weekly coordination meetings shall be held between the Contractor, Owner and the Resident Project Representative. This meeting shall cover the following:
 - 1. Work to be completed the following week
 - 2. Project Schedule
 - 3. Shop Drawing issues
 - 4. Outstanding RFIs and Clarifications
 - 5. Change Orders and Field Orders
 - 6. Review of Record Drawing Information
 - 7. Discussion/Resolution of any old issues
 - 8. New issues discussion
 - 9. Contractor's Safety and Health Plan Updates
- G. Snow Removal Coordination: The Contractor shall be responsible for all snow removal activities in construction and laydown areas onsite.

1.4 CONTRACTOR'S USE OF PREMISES

- A. Contractor work hours will be limited to the work hours as stated in Section 00800 (Supplemental Conditions). Any work outside these hours will require permission of the Owner and adequate notice.
- B. Contractor shall coordinate delivery schedules, site access, and other construction-
- C. Contractor shall assume full responsibility for security of all of their, and their subcontractors, materials and equipment stored on the site.
- D. If directed by the Owner or City, Contractor shall move any stored items which interfere with operations of Owner or City.
- E. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

END OF SECTION

SECTION 01070

ABBREVIATIONS & SYMBOLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Where any of the following abbreviations are used in these Specifications, they shall have the meaning set forth opposite each.

AASHTO American Association of State Highway & Transportation Officials

AC Alternating Current

ACI American Concrete Institute
ACP Asbestos Cement Pipe
AGA American Gas Association
AIC Ampere Interrupting Capacity

AGMA American Gear Manufacturers Association

AIEE(IEEE) American Institute of Electrical Engineers (Institute of Electrical

and Electronics Engineers, Inc.)

AISC American Institute of Steel Construction

AMP Ampere 125-16

Amer. Std. American Standard for Cast Iron Pipe Flanges and Flanged Fittings,

Class 125 (ASA Bl6 11960)

ANSI American National Standards Institute

API American Petroleum Institute
ASA American Standards Association
ASCE American Society of Civil Engineers

ASHRAE American Society of Heating, Refrigerating and Air

Conditioning Engineers

ASME American Society of Mechanical Engineers
ASTM American Society for Testing and Materials
AWG American or Brown and Sharpe Wire Gage

AWWA American Water Works Association

CCTV Closed Circuit Television

CF Cubic Foot

CFM Cubic Foot Per Minute CFS Cubic Foot Per Second

CI Cast Iron

CIPP Cured-in-Place Pipe

CIPRA Cast Iron Pipe Research Association
CSI Construction Specifications Institute

CY Cubic Yard DC Direct Current

DEP Department of Environmental Protection

DI (DIP) Ductile Iron (Pipe)

DOT Department of Transportation EDR Equivalent Directional Radiation EPA U.S. Environmental Protection Agency

FPS Feet Per Second

FT Feet GAL Gallons

GPD Gallons Per Day
GPM Gallons Per Minute

HP Horsepower

IBR Institute of Boiler and Radiator Manufacturers

IN Inches

ISA Instrument Society of America

KVA Kilovolt-ampere

KW Kilowatt LB Pound

MACP Manhole Assessment and Certification Program

MAX Maximum

MGD Million Gallons Per Day

MIN Minimum

NACE National Association of Corrosion Engineers
NASSCO National Association of Sewer Service Companies

NBS National Bureau of Standards

NEC National Electrical Code, Latest Edition NEMA National Electrical Manufacturers Association

NEWWA New England Water Works Association

NPT National Pipe Thread
OS&Y Outside Screw and Yoke
PCA Portland Cement Association

PPM Parts Per Million

PSI Pounds Per Square Inch PSIG Pounds Per Square Inch Gage

PVC Polyvinyl Chloride
RPM Revolutions Per Minute
RUS Rural Utility Service

SF Square Foot

STL. W.G. U.S. Steel Wire, Washburn and Moen, American Steel and Wire

Cos., or Roebling Gage

SY Square yard

TDH Total Dynamic Head

USAS Standards of the United States of America Standards Institute

(formerly American Standards Association)

USS GAGE United States Standard Gage

VC Vitrified Clay

WSP Working Steam Pressure

Fed. Spec. Federal Specifications issued by the Federal Supply Service of the

General Service Administration, Washington, D.C.

END OF SECTION

SECTION 01150B

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. For lump sum items, payment shall be made to the contractor in accordance with an accepted progress schedule and schedule of values on the basis of actual work completed.
- B. For unit-price items, payment shall be based on the actual amount of work accepted and for the actual amount of materials in place, as shown by final measurements.
 - 1. All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Engineer.
 - 2. At the end of each day's work, the Contractor's Superintendent or other authorized representative of the Contractor shall meet with the Resident Project Representative and determine the quantities of unit price work accomplished and/or completed during the workday.
 - 3. The Resident Project Representative will then prepare two "Daily Progress Reports" which shall be signed by both the Resident Project Representative and Contractor's Representative.
 - 4. Once each month the Resident Project Representative will prepare two "Monthly Progress Summation" forms from the month's accumulation of "Daily Progress Reports" which shall also be signed by both the Resident Project Representative and Contractor's Representative.
 - 5. These completed forms will provide the basis of the Engineer's monthly quantity estimate upon which payment will be made. Items not appearing on both the Daily Progress Reports and Monthly Progress Summation will not be included for payment. Items appearing on forms not properly signed by the Contractor will not be included for payment.
 - 6. After the work is completed and before final payment is made, the Engineer will make final measurements to determine the quantities of various items of work accepted as the basis for final settlement.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 SCOPE OF PAYMENT

- A. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted in accordance with the Contract Documents. Upon completion of construction, if these actual quantities show either an increase or decrease from the quantities given in the Proposal Form, the Contract Unit Prices will still prevail.
- B. The Contractor shall accept in compensation, as herein provided, in full payment for furnishing all materials, labor, tools, equipment, and incidentals necessary to the

completed work and for performing all work contemplated and embraced by the Contract; also for all loss or damage arising from the nature of the Work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the Work and until its final acceptance by the Engineer, and for all risks of every description connected with the prosecution of the work, except as provided herein, also for all expenses incurred in consequence of the suspension of the Work as herein authorized.

C. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.

1.4 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. When alterations in the quantities of work not requiring supplemental agreements, as hereinbefore provided for, are ordered and performed, the Contractor shall accept payment in full at the Contract price for the actual quantities of work done. No allowance will be made for anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as stipulated in such agreements.

1.5 OMITTED ITEMS

A. Should any items contained in the bid form be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract, and such action shall in no way invalidate the Contract, and no allowance will be made for items so eliminated in making final payment to the Contractor.

1.6 PARTIAL PAYMENTS

A. Partial payments shall be made monthly as the work progresses. Partial payments shall be made subject to the provisions of the Supplemental and General Conditions.

1.7 PAYMENT FOR MATERIAL DELIVERED

- A. When requested by the Contractor and at the discretion of the Owner, payment may be made for all or part of the value of acceptable, non-perishable materials and equipment which are to be incorporated into bid items, have not been used and have been delivered to the construction site, or placed in storage places acceptable to the Owner. Payment shall be subject to the provisions of the General and Supplemental Conditions.
- B. No payment shall be made upon fuels, supplies, lumber, false work, or other materials, or on temporary structures of any kind which are not a permanent part of the Contract.

1.8 FINAL PAYMENT

A. After final measurements are made by the Engineer, the Contractor will prepare a final quantity invoice of the amount of the Work performed and the value of such Work. Owner shall make final payments of the sum found due less retainages subject to provisions of the General and Supplemental Conditions.

1.9 INCIDENTAL WORK

- A. Incidental work items for which separate payment will not be made includes, but is not limited to, the following items:
 - 1. Clearing, grubbing and stripping
 - 2. Dust control
 - 3. Dewatering
 - 4. Clean-up
 - 5. Erosion control
 - 6. Loam, seeding, grading, liming, fertilization, mulching and watering
 - 7. Compaction testing of backfill
 - 8. Coordination with the Owner, Utilities and others, including related inspection cost (refer to Section 01050)
 - 9. Utility crossings and relocations, unless payment is otherwise made
 - 10. Project Signs
 - 11. Project record documents
 - 12. Materials testing
 - 13. Construction schedules, bonds, insurance, shop drawings, warranties, guarantees, certifications, and other submittals required by the Contract Documents
 - 14. Repair and replacement of water lines under two inches in size, culverts, underdrains, rock lined drainage trenches in streets and other utilities damaged by construction activities and corresponding proper disposal of removed materials unless otherwise paid for
 - 15. Repair to laterals and existing utilities resulting from installation of hydrant assemblies.
 - 16. Cleaning, testing and disinfection of all water lines and appurtenances
 - 17. Temporary utilities for construction and to maintain existing service during construction
 - 18. Temporary utility services to buildings as required to maintain service during construction
 - 19. Quality assurance testing
 - Temporary construction and other facilities not to be permanently incorporated into the Work necessary for construction sequencing and maintenance of operations
 - 21. Weather protection
 - 22. Permits not otherwise paid for or provided by the Owner
 - 23. Visits to the Project site or elsewhere by personnel or agents of the Contractor, including manufacturer's representatives, as may be required
 - 24. On-site and other facilities acceptable to Engineer for the storage of materials, supplies and equipment to be incorporated into the Work
 - 25. Facilities start-up services required by the Contract Documents
 - 26. Additional test pits to determine existing utility locations and elevations, soils conditions, groundwater conditions, dewatering requirements and as required to complete the project
 - 27. Pipe markings
 - 28. Removal of existing pavement

- 29. Flowable Fill
- 30. Earthwork
- 31. Construction administration and insurance

1.10 DESCRIPTION OF PAY ITEMS

A. The following sections describe the measurement of and payment for the work to be done under the respective items listed in the Bid Form. Each unit or lump-sum price stated in the Bid Form shall constitute full compensation, as herein specified, for each item of the work completed.

(1) – Mobilization/Demobilization

- A. Method of Measurement: Lump sum. Total of bid item shall not exceed 5% of Total Amount of the Bid.
- Basis of Payment: Mobilization/demobilization costs are those costs of initiating and В. ending the contract. Payment for mobilization/demobilization shall be a lump sum at the price as stated in the Bid Form. Seventy-Five percent (75%) of the lump sum will be payable when the Contractor is operational on the site and the remaining 25% of the lump sum will be payable when the Contractor leaves the site following the completion of all contract work. For purposes of payment on this item, "Operational" shall mean the Contractor has provided all required and properly executed bonds and insurance certificates and the owner has approved the following: Construction Schedule, Erosion Control Plan, Pre-Blast Survey and Blasting Plan, Traffic Control Plan, Project Sign (and installed), Temporary Facilities (including Engineer's Trailer), and Pre-Construction photographs/videos. "Operational" shall also mean Contractor has performed the pre-construction television sewer inspection, delivered the records of it to the Engineer and the Engineer has acknowledged the records are accurate and of use. "Operational" shall mean the temporary field office is fully functional and power, phone and internet are functioning. Only one lump sum payment divided into the two partial payments described herein shall be made to cover all mobilization/demobilization costs throughout the entire contract.

(2) - Traffic Control

- A. Method of Measurement: Traffic regulation and control will be paid for at the Lump Sum unit price as stated in the Bid Schedule.
- B. Basis of Payment: Payment for traffic regulation and control shall constitute full compensation for all traffic regulation and control efforts and including all labor, permit fees, materials, equipment, signage and supervision required to provide comprehensive and professional traffic regulation and control at all project locations, excluding uniformed police officer. The traffic control plan, temporary pavement markings for traffic re-routing and pedestrian safety are included in this item. The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is equal to the percentage of completion of the entire Contract.

(3) – Traffic Control via Uniformed Police Officers

- A. Method of Measurement: Allowance to be included and carried in the bid schedule.
- B. Basis of Payment:

- 1. The payment shall cover the cost charged to the Contractor by the Springfield Police Department for providing Uniformed Police Officers for traffic control, only in areas required by the Engineer, Police Department and/or DOT. Excluded from this payment are any costs associated with traffic control, including flaggers, where the Engineer, Police Department and/or DOT do not specifically require the use of Uniformed Police Officers.
- 2. Payment for this item shall be on the basis of invoices presented by the Police Department to the Contractor for the work. No mark-up will be added by the Contractor to the invoice.

(4) - Trench Excavation - Ledge

A. Method of Measurement:

- 1. Ledge excavation measured for payment shall be the number of cubic yards of ledge removed during construction. This quantity shall be determined by:
 - a. Exposing the ledge profile for measurement. Excavation and backfill of the earth overburden shall be considered incidental, and no separate payment shall be made therefore.
 - b. Should the Contractor elect to pre-drill and blast ledge without exposing the ledge surface for measurement, ledge depths shall be determined by the Resident Project Representative at the time of drilling or, when direct drilling observation is not conducted, the ledge profile shall be measured after excavation, and 20% of the ledge volume thus measured shall be deducted due to ledge expansion caused by the blasting operation.
- 2. The payment limit for trench width shall be between vertical planes which are a distance apart equal to the sum of 18 inches plus 1-1/3 times the nominal outside diameter of pipe which is to be installed in the trench (min. of 3 feet) and extending from the top of the ledge surface to a depth of 6 inches below the invert grade of the pipe. Where two pipes are installed in the same trench, trench ledge excavation shall be measured as the actual volume of ledge removed between vertical planes which are a distance apart equal to the sum of 3 feet plus the sum of the pipes nominal outside diameter. Where three pipes are installed in the same trench, trench ledge excavation shall be measured as the actual volume of ledge removed between vertical planes which are a distance apart equal to the sum of 4.5 feet plus the sum of the pipes nominal outside diameter.
- 3. Ledge excavation for structures (including manholes) shall be measured as 18 inches outside the structure and extending to a depth of 6 inches below the base of the structure indicated on the Drawings.
- 4. Rocks or boulders greater than two cubic yards volume shall be considered as ledge excavation. Volume of rocks shall be determined from their average length, width, and depth as measured by the Engineer.

B. Basis of Payment:

1. The contract unit price per cubic yard for ledge excavation shall be full compensation for all labor, materials, tools and equipment necessary to complete the excavation including conducting the pre-blast survey, drilling, blasting, excavating, loading and disposing the excess or unusable material

- outside the work limits, suitable replacement backfill, and all else incidental thereto for which payment is not provided under other items.
- 2. Not all the potential ledge locations are identified on the Drawings and ledge could be encountered anywhere within the limits of work. Such ledge, if encountered, is not considered a Differing Subsurface or Physical Condition. The unit price in the bid form shall apply to all ledge encountered and removed.

(5) - Replacement of Unsuitable Material Above Pipe Bedding and Initial Backfill

A. Method of Measurement: Quantity to be paid for under this item shall be the number of cubic yards of material removed and replaced with materials from off-site as authorized by the Engineer. The payment limit for this item shall be between vertical planes that are a distance apart equal to a maximum of 6-feet extending from the top of the initial backfill layer to the bottom of the aggregate subbase layer as called out in the contract drawings for the length of the excavation as directed by the Engineer.

B. Basis of Payment:

- 1. Excavated unsuitable materials shall be paid for at the unit price per cubic yard stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all labor, equipment, and tools necessary for the excavation of unsuitable material including the disposal of materials; furnishing installing and compacting replacement suitable backfill, and for all other work and expenses incidental thereto for which payment is not provided under other items.
- 2. Material excavated that could have, in the opinion of the Engineer, remained in place through the use of adequate dewatering efforts shall be replaced by the Contractor at no additional cost to the Owner.
- 3. Excess backfill material may be available during the Contract. This item shall be used to pay for excavation of unsuitable materials above the initial backfill layer only if no suitable backfill material previously excavated under this Contract is available.

(6) - Excavation Below Grade and Replacement Backfill

A. Method of Measurement: Quantity to be paid for under this item shall be the number of cubic yards of material removed and replaced below the pipe or structure bedding with materials from off-site as authorized by the Engineer. The payment limit for this item shall be between vertical planes that are a distance apart equal to the sum of 18 inches plus 1-1/3 times the nominal inside diameter of pipe to be installed (minimum 3 feet) extending from the typical excavation depth called out in the contract drawings (bottom of bedding layer) to the depth accepted by the Engineer for the length of the excavation as directed by the Engineer.

B. Basis of Payment:

1. Excavated unsuitable materials below the bedding elevation shall be paid for at the unit price per cubic yard stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all labor, equipment, and tools necessary for the excavation of unsuitable material including the disposal of materials; and including furnishing installing and compacting replacement suitable backfill, and filter fabric, and for all other work and expenses incidental thereto for which payment is not provided under other items.

2. Material excavated below pipe bedding grade that could have, in the opinion of the Engineer, remained in place through the use of adequate dewatering efforts shall be replaced by the Contractor at no additional cost to the Owner.

(7) - Test Pit Excavation and Backfill

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of test pits performed as authorized by the Engineer.
- B. Basis of Payment: Test pit excavations shall be paid for at the unit price per each test pit as stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all labor, tools, and equipment; for sawcut and removal of pavement, excavation (except ledge excavation), dewatering, backfill including aggregate base and sub base compaction, temporary pavement; providing the test pit result information to the Engineer and for all other work and expenses incidental thereto for which payment is not provided under other items.

(8) – Cut, Cap, and Abandonment of Existing Water Main

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of caps furnished and installed complete in place.
- Basis of Payment: Cut, Cap, and Abandon Existing Water Main shall be paid for at B. the unit price per each cap stated in the Schedule of Prices. Said unit price shall be full compensation for cutting and removing existing pavement; installing a support of excavation system and protection of existing utilities and structures; trench excavation; disposal of non-regulated excavated materials; dewatering; dewatering the existing main to be abandoned; checking for potential sources feeding the existing main to be abandoned prior to deactivation; cutting, plugging and bulk-heading with brick and mortar; reporting to the Springfield Fire Department which hydrants in the project area have been "bagged" and taken out of service; removal of all above grade or at grade abandoned water main appurtenances, including but not limited to hydrants, valves, valve boxes, curb boxes, and blow-offs; cutting, capping and removing hydrant laterals within 6-inches of their connection to the abandoned main; furnishing and installing backfill materials; restoring trench surface to grade; grass seeding and all other Items necessary to complete the Work as shown and specified but not included for payment under other Items in the Schedule of Prices.

(9) - Water Main – Temporary Cap and Replacement

- A. Method of Measurement: Temporarily capping and then replacing water mains accepted for payment shall be the actual number of locations where this work is performed and accepted as complete.
- B. Basis of Payment: The temporary capping and replacement of water mains repairs shall be paid for at the Contract unit price per each stated in the Schedule of Prices. Said unit price shall include compensation for furnishing all labor, materials, tools, and equipment necessary for the work including restraining the cap, complete, satisfactorily tested, and operational. Work under this item shall also include sawcutting existing pavement; excavation; disposal of unsuitable material removed from the trench; temporarily supporting all water mains and adjacent utilities; coordination with the Owner to de-energize the water main within the limits of work;

cutting and capping the existing main; furnishing and installing the temporary caps, restraints, and new water main piping, fittings and couplings; disinfection of the pipe prior to installation and insertion into service; furnishing and installing any other utility modified to perform the work; pipe bedding and backfill; testing; repair of road in accordance to applicable SWSC and Springfield DPW standards; and all appurtenant work as needed to complete the work.

(10), (11), (12), (13), and (14) – 4-inch, 6-inch, 8-inch, 10-inch, and 16-inch Ductile Iron Water Main

- A. Method of Measurement: The quantity of water main to be paid for under this item shall be the actual length in feet as measured along the center line of the pipe as laid including all fittings and valves.
- B. Basis of Payment:
 - Water main shall be paid for at the unit price per linear foot stated in the Schedule of Prices. Said unit price shall be full compensation for furnishing and installing all pipes, pipe fittings (except valves), adapters, push on restrained joint gaskets for all non-mechanically restrained pipe joints, polywrap, labor, equipment, tools, and other materials required for the installation of the pipelines; for installing the polywrap; for excavating, existing utility crossings and relocations including support of all utility duct banks shown on the drawings, laying, setting, and jointing all pipes and fittings; for connections and couplings to existing pipes, restrained couplings between CIP and DIP and mechanical joint solid sleeves for DIP to DIP (unless otherwise provided for elsewhere); for furnishing and placing all bedding, haunching and initial backfill; for backfilling including roadway sub-base Gravel Fill Type B and base materials, Dense Graded Crushed Stone according to the Springfield DPW Trench Repair Specifications detail; for thrust blocks and supports; for restraining joints; saddles; for furnishing and placing all temporary sheeting and bracing; for cleaning and testing; for removal and disposal of existing water lines and appurtenances being replaced within the trench; for all labor, tools and construction equipment; disinfection, cleaning and testing of installed water mains, temporary utilities for construction and to maintain existing service during construction (except for temporary water service) including any materials, labor, and equipment the Contractor needs to provide regardless of the construction sequence, cross-over channels and underdrains for sewer, storm drain and water excavation pits, and check dams for all excavated channels and for all other work and expenses incidental thereto for which payment is not provided under other items. Payment for fire hydrant branch piping will be paid for under Furnish and Install Hydrant Assemblies.
 - 2. Payment for this work on interim requisitions shall be according to the following percentages:
 - a. Water main successfully set in place and backfilled 80 percent.
 - b. Water main pressure tested and disinfected 20 percent.

(15) - 1-inch Copper Service

A. Method of Measurement: The quantity of service pipe to be paid for under this item shall be the actual length in feet as measured along the center line of the pipe as laid.

B. Basis of Payment: Pipe shall be paid for at the unit price per linear foot stated in the Bid Schedule. Said unit price shall be full compensation for all service pipe, main pipe and fittings, labor, equipment, tools, and other materials required for sawcut, management, removal and disposal of pavement; excavation (except ledge); the installation of service pipes; locating and verifying the locations of water services to be connected to, utility crossings and relocations, laying, setting, and jointing all pipes and fittings including reducers to connect ³/₄" to 1" services wear required; for making all connections to existing services; for cleaning, testing, and disinfecting; for backfilling; pipe and buried utility markings and location tape, for replacing or rebuilding shrubs, fences, lawns, trees, or other materials, except other such items specifically included in the Bid Schedule; and for all other work and expenses incidental thereto for which payment is not provided under other items. Payment will be made for a service when the tie sheet for that service has been received and accepted by the Engineer.

(16), and (17) - 6-inch, and 8-inch Gate Valves

- A. Method of Measurement: The quantity of gate valves to be paid for under this item shall be the actual number of valves and valve boxes installed complete in place. Payment for gate valves installed on hydrant branches shall be paid for under Item No. (28), Furnish and Install Hydrant Assemblies.
- B. Basis of Payment: Gate valves shall be paid for at the unit price per each stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all materials, labor, equipment, polywrap, and tools; sawcut, management, removal and disposal of pavement; excavation (except ledge); for installing, setting, and jointing the valve and valve box; for restraining joints; for thrust blocks and supports; disinfection, cleaning and testing of installed water mains, for valve box extensions; for testing all valves and valve boxes; and for all other work and expenses incidental thereto for which payment is not provided under other items.

(18), (19) and (20) – Tapping Sleeve and Valve (6-inch x 6-inch, 10-inch x 8-inch and 16-inch x 8-inch)

- A. Method of Measurement: Tapping Sleeve and Valve (6-inch x 6-inch, 10-inch x 8-inch and 16-inch x 8-inch) measured for payment shall be the actual number of tapping sleeves and valves furnished and installed complete in place.
- B. Basis of Payment: Tapping Sleeves and Valves shall be paid for at the unit price per each stated in the Schedule of Prices. Said unit price shall be full compensation for furnishing all materials (tapping sleeves, valves, valve boxes, and joint restraints), labor, equipment, and tools required for the installation of the tapping sleeves and valves; for installing the tapping sleeves, valves, and valve boxes; for removal of existing tapping sleeve and appurtenances; for excavation (except rock excavation), dewatering, bedding, backfill and compaction; for all thrust blocks; for restraining joints; for testing all valves; and for all other work and expenses incidental thereto.

(21) – Abandon Existing Gate Boxes and Curb Sops

A. Method of Measurement: The quantity of gate valves and curb stops to be paid for under this item shall be the actual number of valves and valve boxes abandoned

- complete in place. Payment for gate valves removed during installation of new water mains shall not be included for payment under this item.
- B. Basis of Payment: The unit price shall constitute full compensation for each existing box removed complete, including filling and compacting void, any pavement repair as required and as directed by the Engineer, required to complete the work, and any work not specifically included for payment under other items.

(22) and (23) - 1-inch and 2-inch Corporation Stops and Taps

- A. Method of Measurement: The quantity of corporation stops and taps to be paid for under this item shall be the actual number of stops furnished and installed in the main for service connections.
- B. Basis of Payment: Corporation stops and taps shall be paid for at the unit price per each stated in the Bid Schedule. Said unit price shall be full compensation for all fittings, labor, equipment, and tools necessary for the installation of the corporation stops including sawcut, management, removal and disposal of pavement; excavation (except ledge); tapping the main; and for all work and expenses incidental thereto for which payment is not provided under other items.

(24) - 1-inch Curb Stops

- A. Method of Measurement: The quantity of curb stops to be paid for under this item shall be the actual number furnished and installed for service connections.
- B. Basis of Payment: Curb stops and boxes shall be paid for at the unit price per each curb stop stated in the Bid Schedule. Said unit price shall be full compensation for all fittings, labor, equipment, tools, and other materials required for sawcut, management, removal and disposal of pavement; excavation (except ledge); the installation of the curb stop and box; backfilling, raising to grade, for replacing or rebuilding shrubs, fences, lawns, trees, and other materials except other such items specifically included in the Bid Schedule; and for all other work and expenses incidental thereto for which payment is not provided under other items.

(25) and (26) – 1-inch and 2-inch Air Corporations

- A. Method of Measurement: Air corporations with brass caps shall be measured as the number and size furnished and installed in the completed project and accepted by Engineer.
- B. Basis of Payment: Payment for installing new air corporations will be full compensation for furnishing and installing the air corporations with brass caps on the new cement lined ductile iron water main and as directed by the Engineer. Payment under this item also includes excavation, furnishing and installing backfill materials; furnishing and installing valve box to grade; chlorinating and hydrostatic testing for possible leakage; and all other work required or incidental to the satisfactory completion for which separate payment will be made under other items.

(27) – 2-inch Air Valve Assembly

- A. Method of Measurement: Air Valve Assemblies shall be measured as the number furnished and installed in the completed project and accepted by the Engineer.
- B. Basis of Payment: Payment for installing new Air Valve Assemblies under will be full

compensation for furnishing and installing valves, fittings, pipes, saddles, caps, boxes, covers, and appurtenances; setting; bedding; jointing; backfilling; adjusting boxes; chlorinating and hydrostatic testing for possible leakage; and all other work required or incidental to the satisfactory completion of the Air Valve Assemblies.

(28) - Hydrant Assemblies

- A. Method of Measurement: The quantity of hydrant assemblies to be paid for under this item shall be the actual number installed complete in place.
- B. Basis of Payment:
 - 1. Hydrant assemblies shall be paid for at the unit price per each stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all materials, labor, equipment, and tools; for installing, setting, and jointing; for excavation; for removal of existing hydrants where directed; for all thrust blocks and supports; restraining joints; for the hydrant branch gate valve, tee, hydrant extensions; pipe and hydrant; hydrant snow markers; polywrap; location tape; cleaning, repair to storm drains conflicting with hydrant assemblies, testing and disinfection and of all other work and expenses incidental thereto for which payment is not provided under other items.
 - 2. Payment for this work on interim requisitions shall be according to the following proceedings:
 - a. Hydrant assembly successfully set in place and backfilled 80 percent
 - b. Hydrant assembly pressure tested and disinfected 20 percent.

(29) - Catch Basins

- A. Method of Measurement: Quantity of catch basins to be paid for under these items shall be the actual number of structures installed and accepted complete in place.
- A. Basis of Payment: Catch basins shall be paid for at the unit price per each as stated in the Bid Schedule. Said unit price shall be full compensation for all labor, materials and equipment necessary to complete the installation including, Reinforced Concrete Pipe piping, sawcut, management, removal and disposal of pavement; excavation (excluding ledge), dewatering, bedding, furnishing and installing per the City of Springfield DPW specifications precast sections, furnishing and installing frames and grates at proper grade, backfilling including aggregate base and subbase material, compaction, cleaning sumps and all else incidental thereto for which payment is not provided under other items.

(30) - Pipe Insulation

- B. Method of Measurement: Insulation for ductile iron pipe shall be measured by the number of linear feet of ductile iron pipe and fittings furnished and installed with insulation regardless of pipe size. The length of pipe and fittings to be measured shall be the length of the line after the pipes and fittings have been installed, measured or computed along the center line of the pipe and fittings from the center line of the main line to the face of the terminal pipe or fitting, as shown on the Drawings or as directed by the Engineer.
- C. Basis of Payment: Ductile iron pipe insulation shall be paid for at the contract unit price per linear foot for the linear feet of ductile iron pipe furnished and installed with

the, completed, and in place regardless of the pipe size. This price and payment shall be full compensation for furnishing and installing all insulation, jackets, covers, sealers/adhesives, pipe wrap, transporting materials, cleaning and preparing pipe surfaces, for all coordination with the Owner, and all other Items necessary to complete the Work as shown and specified but not included for payment under other Items in the Schedule of Prices.

(31) - Existing Curbs, Steps, and Walls - Remove and Reset

- A. Method of Measurement: Removal and resetting of existing curbs, steps and walls Measured for payment shall be the actual linear footage of curbs, steps and walls as measured lengthwise along the front face of each section of curb, steps and walls that are removed and reset.
- B. Basis of Payment: The Contract unit price per linear foot for removal and resetting of existing curbs, steps and walls shall constitute full compensation for all labor, equipment and materials necessary to complete this work including removing and reinstalling walls, subgrade preparation, placement of concrete fill and bedding, backfill and all labor and appurtenances incidental thereto for which payment is not provided under other items.

(32) - Preformed Pavement Marking Symbols

- A. Method of Measurement: The quantity of preformed pavement marking symbols to be paid for under this item shall consist of the number of non-linear or non-striped pavement marking symbols placed on the final wearing course at the direction of the Engineer based on established areas as shown in the plans. Temporary pavement markings are incidental.
- B. Basis of Payment: unit price shall be full compensation for furnishing all materials, labor, equipment and tools necessary for furnishing and placement of nonlinear pavement marking symbols including; arrows, handicap insignia, bike lane designators, and letters applied on pavement.

(33) – 4" White & Yellow Thermoplastic Reflectorized Pavement Markings

- A. Method of Measurement: The quantity of reflectorized pavement markings to be paid for shall be the number of linear feet of 4" thermoplastic reflectorized pavement markings installed in accordance with the Contract Documents and accepted by the Engineer.
- B. Basis of Payment: Payment at the contract unit price per linear foot shall be full compensation for furnishing all materials, labor and equipment required to install the thermoplastic reflectorized pavement markings, disposal of surplus materials, and all other work and expense incidental thereto per the City of Springfield DPW specifications. Reapplication of the material for any reason will not be compensated.

(34) - Grind Existing Pavement Liberty Street / Dwight Street Curb-to-Curb (2-inch depth)

A. Method of Measurement: The quantity of grind existing pavement to be paid for under this item shall consist of the number of square yards of area ground as shown on the Drawings and as authorized/directed by the Engineer. Actual pavement dimensions will be used in calculating area wherever the width and/or the length of

- pavement removed differs than the limits shown on the Drawings.
- B. Basis for Payment: The Contract unit price per square yard shall be full compensation for furnishing all labor, materials, tools and equipment necessary to complete this work including grinding the existing pavement to a depth of 2 inches and disposal of existing roadway materials, broom cleaning existing ground surfaces, and all else incidental thereto for which payment in not provided under other items.

(35) –Permanent Bituminous Concrete Pavement Liberty Street / Dwight Street Curb-to-Curb (2-inch depth)

- A. Method of Measurement: The quantity of temporary (permanent) bituminous concrete pavement to be paid for under this item includes curb-to-curb paving at Liberty Street / Dwight Street as indicated on the plans, placed and compacted, as specified for the street type and calculated as described below, within the payment limits shown on the Drawings. Pavement outside of pavement limits will not be measured for payment.
 - 1. The quantity of pavement to be paid for under these items shall be measured by the ton, based on actual area of paving installed times the installed depth of material in accordance with these specifications regardless of the pavement mix design used, times a factor of 0.056 tons per square yard per inch of material, complete in place and approved in accordance with the Pavement Restoration Details.
- B. Basis of Payment: Pavement shall be paid for at the Contract unit price per ton stated in the Schedule of Prices. Said unit price shall be full compensation for furnishing all materials, labor, transportation and construction equipment and tools necessary for the placement and removal of pavement, cutting, excavating, preparation of base material, application of tack coat, placement and grading of gravel shoulder material to back up overlay pavement, furnishing, placing, and compacting all materials, adjusting castings to grade, and all other work and expense incidental thereto including correction of paving area settlement. No additional payment will be made to the contractor for repair work done by him in maintaining bituminous concrete pavement.

(36 and 37) – Temporary (Initial) Bituminous Concrete Pavement and Permanent Bituminous Concrete Pavement

- A. Method of Measurement: The quantity of temporary (initial) bituminous concrete pavement to be paid for under this item includes temporary trench paving at locations where the temporary paving meets the minimum thickness of hot mix asphalt surface course, placed and compacted, as specified for the street type and calculated as described below, within the payment limits shown on the Drawings. Pavement outside of pavement limits will not be measured for payment.
 - 1. The quantity of temporary (initial) bituminous concrete pavement to be paid for under this item includes temporary paving for sidewalks and driveways where the temporary paving meets the minimum thickness of hot mix asphalt surface course, as specified for the sidewalk or driveway and calculated as described below, within the payment limits shown on the Drawings. Pavement outside of pavement limits will not be measured for payment.

- 2. The quantity of permanent bituminous concrete pavement shall be limited to the width of the trench specified, times the thickness of the intermediate course hot mix asphalt in accordance with the "Trench Backfilling Method for Arterial Streets in Springfield" detail in the Project Manual, plus an additional 12-inch width on each side of the trench for top course pavement overlap, milling and T-patch overlay. Pavement outside of pavement limits will not be measured for payment.
- 3. Actual widths will be used in computing area wherever the width of pavement removed and replaced is less than the limits indicated on the Drawings.
- 4. The quantity of pavement to be paid for under these items shall be measured by the ton, based on actual width of trench paving installed or the maximum width of trench allowed per these specifications (whichever is the lesser), times the installed depth of material in accordance with these specifications regardless of the pavement mix design used, times a factor of 0.056 tons per square yard per inch of material, complete in place and approved in accordance with the Pavement Restoration Details.
- B. Basis of Payment: Pavement shall be paid for at the Contract unit price per ton stated in the Schedule of Prices. Said unit price shall be full compensation for furnishing all materials, labor, transportation and construction equipment and tools necessary for the placement and removal of pavement, cutting, excavating, preparation of base material, application of tack coat, placement and grading of gravel shoulder material to back up overlay pavement, furnishing, placing, and compacting all materials, adjusting castings to grade, and all other work and expense incidental thereto including correction of trench settlement. Payment under Permanent Paving includes the removal and disposal of the temporary pavement and portion of roadway base, where required. Maintaining the trench daily with cold patch when hot mix asphalt is unavailable shall not be paid for but shall be considered incidental to the work. No additional payment will be made to the contractor for repair work done by him in maintaining bituminous concrete pavement.

(38) - Concrete Sidewalk and Driveways

- A. Method of Measurement: The quantity of Portland cement concrete sidewalks and driveways to be paid for under this Item shall be the number of square yards of cement concrete placed in accordance with the Contract Documents and accepted by the Engineer.
- B. Basis of Payment: Payment under this Item at the Contract unit price per square yard shall be full compensation for furnishing, placing, fine grading, and compacting gravel for base course; furnishing, placing, finishing and curing Portland cement concrete; forms and joint materials; steel reinforcing; raised surface detector panels at ramps; and all other work and expense incidental thereto.

(39) – Flowable Fill

A. Method of Measurement: The quantity of flowable (controlled density) fill to be paid for shall be the number of cubic yards of flowable fill measured in place up to the pay limits defined by the Contract Documents, placed by order of the Engineer for encasement of pipelines, backfills and other uses for which payment is not provided in

other items.

B. Basis of Payment: Payment shall be at the contract unit price per cubic yard and shall constitute full compensation for providing all flowable fill ingredients, mixing and depositing flowable fill, curing, protecting and removing forms and supports and all other incidental work including traffic controls and expense in connection therewith. Payment for flowable fill shall be limited to a 5-foot width for water mains.

(40) – Repair/Replace Traffic Signal Loop Detector

- A. Method of Measurement: Repair/Replace Traffic Signal Loop Detector will be paid for at the Lump Sum unit price as stated in the Schedule of Prices.
- B. Basis of Payment: Repair/replace traffic signal loop detector shall be paid for at the lump sum price as stated in the Bid Schedule. All loop detectors repaired or replaced on this project will be paid for under this lump sum Item. Said lump sum price shall be full compensation for coordination with the Springfield DPW; for all connecting cable, splicing and connecting; for saw cutting and sealing pavement; for furnishing all materials, labor, equipment and tools required for the repair or replacement of the loop detectors; and for all other work and expenses incidental thereto.

(41) – Additional Pipe Fittings

- A. Method of Measurement: The quantity shall be the number of pounds of standard fittings, except flexible couplings and sleeves, furnished and installed by order of the Engineer in excess of the total weight of all fittings indicated by the Contract Documents. The weights paid for shall be the standard weights, excluding accessories, given by the specifications of the AWWA/ANSI Standards for the fittings as specified in SECTION 02665 —WATER MAINS AND APPURTENANCES.
- B. Basis of Payment: Payment shall be full compensation for furnishing, handling, and installing additional pipe fittings and all other necessary work incidental thereto.

(42) – CCTV and Cleaning of Sewer Pipelines

- A. Method of Measurement: Closed Circuit Television Inspection (CCTV) of the existing sewer pipelines shall be measured on a per linear foot basis to the nearest foot. Measurement shall be along the horizontal centerline of the pipe with no deductions for manholes and shall be from center of manhole to center of manhole.
- B. Basis of Payment: CCTV of the existing sewer pipelines shall include, but not be limited to providing all equipment, materials and labor for inspecting the sewer pipe, maintenance of flows in the existing sewers including bypass pumping and plugs, light cleaning and disposal of debris, creating copies of the digital video inspection on a USB or portable hard drive to be delivered to the Owner and Engineer, creating copies of the inspection logs to be delivered to the Owner and Engineer, and all else incidental thereto for which separate payment is not provided under the Schedule of Prices. CCTV shall be performed prior to and after the installation and commissioning of the water main, but prior to final paving such that any defective sewer items that are identified can be repaired prior to final paving.

(43) – CCTV of Sewer Laterals to Property Line

A. Method of Measurement: Closed Circuit Television Inspection (CCTV) of the

- existing sewer laterals shall be measured per each lateral inspected as directed.
- B. Basis of Payment: CCTV of the existing sewer laterals shall include, but not be limited to providing all equipment, materials and labor for inspecting the sewer lateral, maintenance of flows in the existing sewers including bypass pumping and plugs, creating copies of the digital video inspection on a USB or portable hard drive to be delivered to the Owner and Engineer, creating copies of the inspection logs to be delivered to the Owner and Engineer, and all else incidental thereto for which separate payment is not provided under the Schedule of Prices. CCTV shall be performed prior to and after the installation and commissioning of the water main, but prior to final paving such that any defective sewer items that are identified can be repaired prior to final paving.

(44) Utility Service Allowance and Fire Service Testing

- A. Method of Measurement: Cash Allowance.
- B. Basis of Payment: Engineer shall assist Contractor in establishing the fee with the local utility companies (electrical, telephone, etc.) for the applicable utility service(s) and coordinate with local business to calibrate fire systems affected by temporary bypass and final water service connection.

(45) –Price Adjustments

- A. Pay Items
 - 1. Pay Item a: Diesel Fuel Price Adjustment
 - 2. Pay Item b: Gasoline Fuel Price Adjustment
 - 3. Pay Item c: Liquid Asphalt Price Adjustment
- B. Method of Measurement: The method of measurement for the price adjustment items is as described in Section 01151.
- C. Basis of Payment: The method of measurement for the price adjustment items is as described in Section 01151.

(46) – Allowance for Unforeseen Conditions

- A. Method of Measurement:
 - 1. Total of bid item shall not exceed 5% of Total Amount of the Bid excluding item 1A mobilization and demobilization. The compensation for unforeseen conditions that the Contractor may encounter during construction. These conditions may include, but not be limited to, removal, handling, testing, and disposal of asbestos cement pipe not shown on the Contract Drawings, other hazardous material encountered within the limits of the proposed work. and other unforeseen conditions not shown on the Drawings including but not limited to additional work ordered by the Engineer for which specific items of work are not included within the Contract Documents. Such work may include but not be limited to removal, resetting, replacement, and/or reconstruction of fences, stone walls, landscaped planting beds (other than lawn areas), irrigation systems on private property, that are not shown on the Drawings and/or become directly impacted by work ordered by the Engineer, and require removal and reinstallation to perform the work.
- B. Basis of Payment:

2. The quantity to be paid for shall be an amount negotiated with the Contractor on a case by case need, based on fair and common standard industry practices for the work to be performed, and shall be considered full compensation for furnishing all labor, materials and equipment required for such work completed to the satisfaction of the Engineer.

END OF SECTION

SECTION 01151

SPECIAL PROVISIONS – PRICE ADJUSTMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. In accordance with Massachusetts General Law (MGL) Chapter 30, Section 38A, contracts for water and sewer projects awarded under MGL Chapter 30 Section 39M shall include price adjustment clauses for fuel (both diesel and gasoline), liquid asphalt and Portland cement contained in cast-in-place concrete.
- B. The work under this Contract includes price adjustments for hot mix asphalt, Portland cement, diesel fuel, and gasoline. Base Prices for hot mix asphalt, Portland cement, diesel fuel, and gasoline under this Project are defined as the Price presented on the Massachusetts Department of Transportation (MassDOT) website. MassDOT posts Price Adjustments on their Highway Division's website at https://www.mass.gov/massdot-contract-price-adjustments under the following link sequences:

Website: Mass.gov Link 1: Living Select Transportation

Scroll down toward the bottom and under Related Information

Link 2: Department of Transportation Scroll down and under Our Organizations

Link 3: Highway Division

Scroll down to Featured Topics and under Highway Construction Resources

Link4: MassDOT Contract Price Adjustment

Link5: (Year) Price Adjustments

Prices may not be available for the month in which the project is Bid at the time the project is advertised for Bid. The Base Price will be confirmed after Contract Award and before the first monthly payment requisition. For this project, the recent Base Price History for the specified items is presented within Table 1.

Table 1 –Base Price History						
Description	Unit	October	November	December		
Description		2019	2019	2019		
Diesel Fuel	per gallon	\$2.376	\$2.390	\$2.451		
Gasoline	per gallon	\$2.036	\$2.060	\$2.063		
Hot Mix Asphalt	per ton	\$535.00	\$535.00	\$535.00		
Portland Cement	per ton	\$125.47	\$125.47	\$128.48		

N/A = Not Available

1.2 <u>REQUIREMENTS SPECIFIED ELSEWHERE</u>

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE

- A. Method of Measurement: The Bid Form does not include a specific Work Item for fuel consumption; fuel consumption is considered incidental to the work. However, in order to comply with the MGL, compensation for fluctuations in fuel prices will be made based on monthly quantities of the designated work items completed during the payment period and the Fuel Use Factors presented in Table 5.
- B. Basis of Payment: The Contract includes an allowance to be used for all price adjustments including price adjustments for diesel fuel and gasoline. The Price Adjustment will be based on the variance in price for diesel fuel and gasoline from the Base Price to the Period Price only. Since the posted Prices may not be available before the end of the active work month for inclusion in the Payment Application, the Price Adjustment will be assessed in the following month's Payment Application once pricing information for the period is available.
 - 1. Base Price: The Base Price of diesel fuel and gasoline will be the price as indicated on the MassDOT website (www.massdot.state.ma.us) for the month in which the contract was bid, which includes State Tax.
 - 2. Period Price: The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month as posted on the MassDOT website.
 - 3. The adjustment will be based on fuel usage factors for various items of work developed in the National Cooperative Highway Research Program Report 744 (Transportation Research Board, 2013) and modified to correspond to Federal Highway Administration Technical Advisory T5080.3 (1980) and Highway Research Board Circular 158 (1974). These factors will be multiplied by the quantities of work completed under the designated Work Item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.
 - 4. The fuel Price Adjustment will apply only to the items of work listed in Table 5 at the fuel factors shown and for the quantities of those work items during that month
 - 5. The 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 for either a 5% upward or 5% downward adjustments.
 - 6. No Price Adjustment will be allowed beyond the Substantial Completion Date of this Contract, unless an extension of time beyond the contractual Substantial Completion Date has been issued and approved by the Owner.

1.4 MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT MIXTURES

- A. Method of Measurement: The quantity of the hot mix asphalt (HMA) mixtures will be measured under the respective Bid Item(s) in the Contract. The Price Adjustment will be made based on the quantity installed during the monthly payment period.
- B. Basis of Payment: The Contract Price of the hot mix asphalt (HMA) mixtures will be paid under the respective Bid Item(s) in the Contract. The Contract includes an allowance to be used for all price adjustments including price adjustments for Hot Mix Asphalt Mixtures. The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price only. The adjustment shall not include transportation or other charges. Since the posted

Prices may not be available before the end of the active work month for inclusion in the Payment Application, the Price Adjustment will be assessed in the following month's Payment Application once pricing information for the period is available.

- 1. Base Price: The Base Price of Hot Mix Asphalt Mixtures will be the price as indicated on the MassDOT website (www.massdot.state.ma.us) for the month in which the contract was bid, which includes State Tax.
- 2. Period Price: The MassDOT website lists two sets of period prices. The "New Asphalt Period Price Method" applies to this Contract.
- 3. The "New Asphalt Period Price Method" presents the Period Price of liquid asphalt for each monthly period as determined by MassHighway 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. MassHighway will post this Period Price on their website within two business days following their receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted MassHighway the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.
- 4. The Contract Price of the hot mix asphalt mixture 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 completed and accepted, using the monthly period price for the month during which the work was performed and will be paid under the Price Adjustment Allowance in the Payment Application.
- 5. The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Contract Documents and as measured for the Hot Mix Asphalt Work Item.
- 6. The Price Adjustment will be determined using the following formula; the quantity of tons of hot mix asphalt mixture placed during each monthly period multiplied by the liquid asphalt content percentage multiplied by the variance in price between Base Price and Period Price of liquid asphalt. The liquid asphalt content, for the purpose of this adjustment, will be 5.5% (0.055) for each ton of bituminous concrete mixture regardless of percentages established in the Massachusetts Job Mix Formula (M3.11.03) of the Standards.
- 7. The 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 for either a 5% upward or 5% downward adjustments.
- 8. No Price Adjustment will be allowed beyond the Substantial Completion Date of this Contract, unless an extension of time beyond the contractual Substantial Completion Date has been issued and approved by the Owner.

1.5 MONTHLY PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

A. Method of Measurement: The quantity of the Portland Cement Concrete Mixes will be measured under the respective items in the Contract. The Price Adjustment will be made based on the quantity installed during the monthly payment period.

- B. Basis of Payment: The Contract Price of the Portland Cement Concrete Mixes will be paid under the respective item(s) in the Contract. The Contract includes an allowance to be used for all price adjustments including price adjustments for Portland Cement Concrete Mixes. 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 only. It shall not include transportation or other charges. Since the posted Prices may not be available before the end of the active work month for inclusion in the Payment Application, the Price Adjustment will be assessed in the following month's Payment Application once pricing information for the period is available.
 - 1. Base Price: The Base Price of Portland cement will be the price as indicated on the MassDOT website (www.massdot.state.ma.us) for the month in which the contract was bid, which includes State Tax.
 - 2. 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 MassHighway website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.
 - 3. 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 completed and accepted, using the monthly period price for the month during which the work was performed and will be paid under the Price Adjustment Allowance in the Payment Application.
 - 4. 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.
 - 5. The Price Adjustment will be determined using the following formula; the quantity of cubic yards of Portland cement concrete placed during each monthly period multiplied by the Portland cement content percentage multiplied by the variance in price between the Base Price and Period Price of Portland cement.
 - 6. 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 for either a 5% upward or 5% downward adjustments.
 - 7. No Price Adjustment will be allowed beyond the Substantial Completion Date of this Contract, unless an extension of time beyond the contractual Substantial Completion Date has been issued and approved by the Owner.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 PREPARATION OF MONTHLY PAYMENT APPLICATION

A. Payment Applications shall be submitted monthly. Table 2 presents an example calculation for determining Price Adjustments for the specified items.

Note: In this example, the Payment Application for June will be submitted at the end of June or early in July and shall include all of the work performed during the month of June and Price Adjustments for the work performed in May.

For this example, 1,000 linear feet of 12-inch diameter water main was installed and 400 tons of full-width final bituminous pavement over 1,000 feet of roadway were completed in May. No concrete was installed during the Month of May.

Table 2 – Example Project Related Prices					
Description	Unit	Base Price	May 2013	June 2013	
Diesel Fuel	per gallon	\$3.25	\$3.50	N/A	
Gasoline	per gallon	\$3.00	\$3.20	N/A	
Hot Mix Asphalt	per ton	\$600.00	\$625.00	N/A	
Portland Cement	per ton	\$100.00	\$90.00	N/A	

Based on the example Prices in Table 2, an assessment of whether or not Price Adjustments will be paid for this example is presented in Table 3.

Table 3 – Example Price Adjustment Assessment					
Item	Base Price	Period Price	Price Difference	% Change	Price Adjustment Required
Diesel Fuel	\$3.25	\$3.50	\$0.25	7.7%	Yes, >5%
Gasoline	\$3.00	\$3.20	\$0.20	6.7%	Yes, >5%
Hot Mix Asphalt	\$600.00	\$625.00	\$25.00	4.2%	No, <5%
Portland Cement	\$100.00	\$90.00	-\$10.00	-10%	Yes, >5%

As indicated in Table 3, Price Adjustments for this example would be required for Diesel Fuel, Gasoline and Portland cement if work items were performed during the Month of May.

Table 4 presents the Price Adjustment calculations for this example.

Table 4 – Example Diesel Fuel and Gasoline Price Adjustment					
Work Item	Overtity	Unit	FUF ¹	Price	Price
WOR Item	Quantity			Difference	Adjustment
12-inch Water Main					
Diesel Fuel	1,000	L.F	0.610	\$0.25	\$152.50
Gasoline	1,000	L.F	0.261	\$0.20	\$52.20
Asphalt Hauling/Placement					

TOTAL PRICE ADJUSTMENT	700	1011	0.502	ψ0.20	\$455.26
Gasoline	400	Ton	0.502	\$0.20	\$40.16
Diesel Fuel	400	Ton	1.104	\$0.25	\$210.40

^{1.} FUF = Fuel Use Factor

Note: The example indicates that a Price Adjustment will be applied for the payment period for fuel associated with asphalt hauling and placement, but no Price Adjustment would be applied for Hot Mix Asphalt Mixtures as the Price difference for the material was less than 5%. Also, no Price Adjustment is included for Portland cement as no quantity of concrete was completed during the pay period. If concrete had been installed, it would have resulted in a negative Price Adjustment or deduction.

B. Table 5 presents the Fuel Use Factors to be used for this project.

Table 5 – Fuel Use Factors					
Work Items	Diesel Use Factor	Gasoline Use Factor			
Pipe Installation – including excavation, backfill, pipe installation, fittings, valves, insulation, and incidentals	0.610 gal/LF	0.261 gal/LF			
Asphalt Pavement – including haul, placement and compaction for trench and sidewalk, and incidentals	2.104 gal/Ton	0.502 gal/Ton			
Curbing – including removal, replacement or reinstallation of either asphalt of granite, and incidentals	0.106 gal/LF	0.046 gal/LF			
Earth Excavation – including excavation, removal, hauling, disposal, and incidentals	0.207 gal/cy	0.112 gal/CY			
Rock Excavation – including ledge and boulder removal and disposal, and material replacement, and incidentals	0.326 gal/CY	0.140 gal/CY			
Unsuitable Material Excavation – including excavation and disposal, and material replacement, and incidentals	0.207 gal/CY	0.112 gal/CY			
Water Storage Tank Demolition – including removal, disposal, hauling, and incidentals	262.50 gal/Tank	112.50 gal/Tank			
Base Stone – includes hauling, material placement, and incidentals	0.279 gal/Ton	0.279 gal/Ton			
Concrete – including production, hauling, placement, and incidentals	0.742 gal/CY	0.715 gal/CY			
Fencing – including excavation, hauling, and installation	0.022 gal/LF	0.022 gal/LF			

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: To enable orderly review during progress of the work, and to provide for systematic discussion of problems, the Engineer will conduct project meetings throughout the construction period.

1.2 <u>REQUIREMENTS SPECIFIED ELSEWHERE</u>

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 QUALITY ASSURANCE

A. Persons designated by the Contractor to attend and participate in the project meetings shall have all required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.4 **SUBMITTALS**

- A. Agenda items: To the maximum extent practicable, advise the Engineer at least 24 hours in advance of project meetings regarding all items to be added to the agenda.
- B. Minutes: The Engineer will compile minutes of each project meeting and will furnish a copy to the Contractor. The Contractor may make and distribute such other copies as they wish.

PART 2 - PRODUCTS

(No products are required in this Section.)

PART 3 - EXECUTION

3.1 MEETING SCHEDULE

A. Except as noted below for Preconstruction Meeting, project meetings will be held monthly. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.2 MEETING LOCATION

- A. Meetings will be held at the job site in the Engineers' field office, unless the Owner and/or Engineer determine that virtual meetings are applicable and appropriate for any reason (e.g., COVID, Safety and Health Plan, etc.).
 - 1. If meetings are required by Owner/Engineer to be held virtually, Engineer will host the meetings via Microsoft Teams. All required meeting attendees are responsible for providing hardware necessary to view, share, be heard and hear content of the meeting.

3.3 PRECONSTRUCTION MEETING

- A. Preconstruction meeting will be scheduled within twenty days after the Effective Date of the Agreement, but before the Contractor starts work at the site. Provide attendance by authorized representatives of the Contractor and all major subcontractors. The Engineer will advise other interested parties and request their attendance.
- B. Minimum agenda: Distribute data on, and discuss:
 - 1. Identification of key project personnel for Owner, Engineer, Contractor, funding/regulatory Agencies.
 - 2. Responsibilities of Owner, Engineer, Resident Project Representative, Contractor.
 - 3. Channels and procedures for communications.
 - 4. Construction schedule, including sequence of critical work.
 - 5. Easements, permits.
 - 6. Contract Documents, including distribution of required copies of original documents and revisions.
 - 7. Processing of Shop Drawings and other data submitted to the Engineer for review.
 - 8. Processing of field decisions and Change Orders.
 - 9. Rules and regulations governing performance of the Work, including funding/regulatory Agency requirements.
 - 10. Procedures for safety and first aid, security, quality control, housekeeping, and other related matters.

3.4 PROJECT MEETINGS

- A. Attendance: To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work. The Superintendent shall attend. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspects of the Work are involved.
- B. Minimum agenda:
 - 1. Review, revise as necessary, and approved minutes of previous meeting.
 - 2. Review progress of the Work since last meeting, including status of submittals for approval.
 - 3. Review schedule of work to be accomplished prior to next meeting.
 - 4. Discuss monthly partial payment request.
 - 5. Review status of change order requests and Work Directive Changes.
 - 6. Identify problems which impede planned progress.
 - 7. Develop corrective measures and procedures to regain planned schedule.
 - 8. Complete other current business.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Within ten (10) days after the effective date of the Agreement between Owner and Contractor submit to the Engineer an estimated progress schedule as specified herein.
- B. Form of Schedules:
 - 1. Narrative: Completely describe the construction methods to be employed.
- C. Content of Schedules:
 - 1. Provide complete sequence of construction by activity:
 - a. Shop Drawings, Project Data and Samples:
 - i. Submittal dates.
 - ii. Dates reviewed copies will be required.
 - b. Decision dates for:
 - i. Products specified by allowances.
 - ii. Selection of finishes.
 - c. Estimated product procurement and delivery dates.
 - d. Dates for beginning and completion of each element of construction.
 - 2. Identify work of separate phases and logically grouped activities.
 - 3. Show the projected percentage of completion for each item of work as of the first day of each month.
 - 4. Provide separate sub-schedules, if requested by the Engineer, showing submittals, review times, procurement schedules, and delivery dates.

D. Updating:

- 1. Show all work activities including those already complete.
- 2. Show all changes occurring since previous submission.
- 3. Indicate progress of each activity, show completion dates.
- 4. Include:
 - a. Major changes in scope.
 - b. Activities modified since previous updating.
 - c. Revised projections due to changes.
 - d. Other identifiable changes.
- 5. Provide narrative report, including:
 - a. Discussion of problem areas, including current and anticipated delay factors.
 - b. Corrective action taken or proposed.
 - c. Description of revisions that may affect schedules.
 - d. Description of activities to be performed in the next 6-week period.
 - e. Updated list of key shop drawings, project data and samples to be submitted in the next 6-week period.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 **SUBMITTALS**

- A. Submit updated schedules with each progress payment request.
- B. Submit 4 copies of initial and updated schedules to the Engineer.

END OF SECTION

SECTION 01320

SAFETY AND HEALTH PLAN

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

- 1. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work, as outlined herein and in the General and Special Conditions of the Contract Documents. Within 10 days after the effective date of the Agreement between Owner and Contractor, submit to the Engineer a Safety and Health Plan as specified herein. Refer to submittals section below.
- 2. Contractor shall comply with all applicable Laws and Regulations related to the safety of persons or property, or for the protection of persons or property from damage, injury, illness, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- 3. Contractor shall designate a qualified and experienced safety representative (OSHA defined "Competent Person") at the site whose duties and responsibilities shall be the prevention of accidents and maintaining and supervising of safety precautions and programs, including a "Job Hazards Analysis".
- 4. The Contractor shall be solely responsible to provide all labor, equipment, and utilities sufficient to ensure no construction noise, particulates, or odors, are allowed to accumulate to levels which adversely affect health or work in, or near the construction area.

B. Content of Safety and Health Plan:

- 1. Prepare complete safety and health plan in accordance with the requirements of CFR Title 29 Part 1926 Safety and Health Regulations for Construction.
 - a. Provide documentation that Contractor's hazardous communication program is up to date.
 - b. Provide documentation that Contractor's safety training is up to date.
 - c. Prepare a project specific Safety and Health Plan addressing construction safety and protection, including but not limited to excavations, fall protection, egress, as well as provisions for construction in hazardous environmental conditions, confined space entry, electrically-classified spaces, chemical storage/handling, biological hazards, etc., at the project site.
- 2. Safety provisions for confined space entry shall follow the requirements of CFR Title 29 Part 1926, Subpart AA Confined Spaces in Construction and will be incorporated into the Safety and Health Plan.

C. Updating:

1. Contractor shall be responsible for updating the Safety and Health Plan as appropriate throughout the course of the construction period.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 SUBMITTALS

- A. Submit the Contractor's site-specific Safety and Health Plan to the Engineer, in accordance with Section 01340. Submit hardcopy submittals, if required.
- B. Submit updated Safety and Health Plans as necessary during the course of the project.
- C. The Safety and Health Plan is provided "for information only" to inform the Owner, Engineer and Resident Project Representative of the project specific safety program requirements; however, if the Safety and Health Plan incomplete (e.g., missing elements relevant to the project work), inadequate (e.g., outdated qualifications) or not project-specific, it will be returned "revise and resubmit". Delays related to an incomplete Safety and Health Plan are the responsibility of the Contractor.
- D. The Contractor will overview the plan with the Owner (and staff), Engineer (and Resident Project Representative) prior to work beginning at the project site, and subsequently when/if the safety plan is updated.
- E. Contractor's most current Safety and Health Plan shall be available at the construction site throughout the construction project.

1.4 ON-SITE COORDINATION MEETINGS

- A. Contractor shall review key aspects of Safety and Health Plan at the Pre-Construction Meeting, and subsequent on-site safety informational meeting.
- B. Contractor shall report to Engineer and Owner at each progress meeting concerning compliance with the Safety and Health Plan for the most recent construction period and new considerations and requirements for the upcoming period.
- C. Contractor shall hold weekly on-site coordination meetings with Resident Project Representative and Owner to ensure that Owner's staff is aware of key Safety and Health Plan requirements of the current phase of construction.

END OF SECTION

SECTION 01340

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included:
 - 1. Submit all shop drawings, Manufacturers' certificates, project data, and samples required by the Specifications.
- B. General Submittals Requirements: This project shall utilize:
 - 1. Submittals Electronic via Email/FTP with Hard Copy for Record
 - a. The Contractor shall submit to the Engineer an electronic submittal of shop drawings in portable document format (PDF) transmitted via email or file transfer protocol (FTP). The Engineer shall return an electronic PDF of the submittal review comments to the Contractor for distribution to subcontractors, suppliers and manufacturers. The electronic submittals shall serve as the electronic record of the project.
 - b. In addition, completed shop drawings shall be provided in hard copy (paper) format, for the record, in accordance with the following requirements.
 - i. Shop drawings manuals shall be considered "completed" once an action code of "0" or "1" has been attained, as specified below, unless otherwise directed by the Engineer.
 - ii. Once completed, the Contractor shall provide two hard copy sets (for Engineer and Resident Project Representative, respectively).
 - iii. Hard copy submittals shall be updated on a monthly basis, for those submittals completed during the preceding month.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 SHOP DRAWINGS

- A. Shop Drawings are required for each and every element of the work.
- B. Shop Drawings are generally defined as all fabrication and erection drawings, diagrams, brochures, schedules, bills of material, manufacturers data, spare parts lists, and other data prepared by the Contractor, their subcontractors, suppliers, or manufacturers which illustrate the manufacturer, fabrication, construction, and installation of the work, or a portion thereof.
- C. The Contractor shall provide a completed Contractor Submittal Certification Form (copy provided for Contractor's use at the end of this Specification Section) which shall be attached to every copy of every shop drawing and signed by the Contractor and Manufacturer (where applicable). Shop Drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular

importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for the work.

- 1. Each shop drawing submittal shall include a complete copy of the relevant specification section markup up to reflect "compliance" or "deviation" on an item-by-item basis.
- D. Shop Drawings shall be submitted as a complete package by specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials and samples associated with each specification section be included as a single submittal for the Engineer's review. Any deviation from this requirement, shall be requested in writing with an anticipated shop drawing breakdown/schedule prior to any associated submittal. An exception to this requirement are shop drawings for reinforcing steel, miscellaneous metals and structural steel, which shall be submitted separately for each structure unless otherwise permitted by the Engineer.
- E. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.
- F. No material or equipment shall be purchased or fabricated especially for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.
- G. Until the necessary review has been made, the Contractor shall not proceed with any portion of the work (such as the construction of foundations), the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which review is required.
- H. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from their subcontractors and returning reviewed drawings to them. Shop drawings shall be formatted to standard paper sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard sizes shall be: (a) 24 inches by 36 inches; (b) 11 inches by 17 inches, and (c) 11 inches by 8-1/2 inches. Provision shall be made in preparing the shop drawings to provide a binding margin on the left hand side of the sheet. Shop drawings submitted other than as specified herein may be returned for resubmittal without being reviewed.
- I. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by their subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to confirm that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer.
- J. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in the transmittal. Shop Drawings that contain significant deviations that are not brought to the attention of the Engineer may be subject to rejection.

- K. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires and appurtenances, layout, etc., detailed on the Drawings, Contractor shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do all work necessary to make such modifications.
- L. A maximum of two submissions of each Shop Drawing will be reviewed, checked, and commented upon without charge to the Contractor. Any additional submissions which are ordered by the Engineer to fulfill the stipulations of the Drawings and Specifications, and which are required by virtue of the Contractor's neglect or failure to comply with the requirements of the Drawings and Specifications, or to make those modifications and/or corrections ordered by the Engineer in the review of the first two submissions of each Shop Drawing, will be reviewed and checked as deemed necessary by the Engineer, and the cost of such review and checking, as determined by the Owner, and based upon Engineer's documentation of time and rates established for additional services in the Owner-Engineer Agreement for this Project, may be deducted from the Contractor to make all modifications and/or corrections as may be required by the Engineer in an accurate, complete, and timely fashion. Resubmittals for the sole purpose of providing written responses to review comments will not be considered a resubmittal counting towards the two submission limit.
- M. Shop Drawings that include drawings or other material that is illegible or too small may be returned without review.
- N. American Iron & Steel certifications must be submitted with the initial shop drawing.
- O. BABAA certifications must be submitted with the initial shop drawing.

1.4 MANUFACTURER'S CERTIFICATES

- A. Prior to accepting the installation, the Contractor shall submit manufacturer's certificates for each item specified.
- B. Such manufacturer's certificates shall state that the equipment has been installed under either the continuous or periodic supervision of the manufacturer's authorized representative, that it has been adjusted and initially operated in the presence of the manufacturer's authorized representative, and that it is operating in accordance with the specified requirements, to the manufacturer's satisfaction. All costs for meeting this requirement shall be included in the Contractor's bid price.

1.5 SUBMISSION REQUIREMENTS

- A. Accompany submittals with a transmittal cover sheet, containing:
 - 1. Date
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. The sequential shop drawing number for each shop drawing, project data and sample submitted shall be:
 - a. Specification Section number followed by a dash and then a sequential number beginning with 01 (e.g., 16000-01).
 - b. Under limited situations when additional different pieces of equipment are submitted under the same specification section, those submittals shall be numbered sequentially (e.g. 05500-01, 05500-02, 05500-03, etc.).

- c. Resubmittals shall include an alphabetic suffix after the corresponding sequential number (e.g., 16000-01A).
- 5. Notification of deviations from Contract Documents.
- 6. Other pertinent data.
- B. A completed Contractor Submittal Certification Form shall be attached to each hardcopy and electronic PDF of each shop drawing and must include:
 - 1. Project name
 - 2. Specification Section and sequential number with alphabet suffix for resubmittal
 - 3. Description
 - 4. Identification of deviations from Contract Documents.
 - 5. Contractor's stamp, initialed or signed, certifying review of the submittal, verification of field measurements and compliance with Contract Documents.
 - 6. Where specified or when requested by the Engineer, manufacturer's certification that equipment, accessories and shop painting meet or exceed the Specification requirements.
 - 7. Where specified, manufacturer's guarantee.
- C. Additional Requirements for Electronic Submittals:
 - 1. Each individual shop drawing submittal shall be contained in one PDF.
 - 2. The first page of the PDF shall be the Contractor Submittal Certification Form as described above.
 - 3. The electronic PDF shall be **exactly** as submitted in the hardcopy.
 - 4. The electronic PDF shall include an electronic table of contents that is bookmarked for each section of the submittal.
 - 5. The electronic PDF shall be configured such that is fully searchable.
 - 6. PDF versions of 24x36 drawings shall be converted to 24 x 36 PDFs so as not to lose the clarity of the original drawing.
 - 7. Electronic PDF submittals that are not submitted in accordance with the requirements stated above will not be reviewed by the Engineer.
 - 8. Electronic submittals shall be transmitted via the protocol established in Part 1 above.

1.6 RESUBMISSION REQUIREMENTS

- A. Revise initial submittals as required and resubmit as specified for initial submittal.
- B. Indicate on submittals any changes which have been made other than those required by Engineer. All renumbering of shop drawings, relabeling of individual pieces or assemblies or relocating of pieces or assemblies to other Drawings within the submittal shall be clearly brought to the attention of the Engineer. If relabeling of individual pieces or assemblies has taken place, the labels from the previous submittal shall be indicated to assist in comparing the original and resubmitted shop drawing.
- C. All resubmittals shall include a summary of the previous submittal review comments with the vendors' written response as to how the previous comments were addressed.

1.7 ENGINEER'S REVIEW

A. The review of shop and working drawings hereunder will be general only, and nothing contained in this specification shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the

- specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance specified thereunder.
- B. The Engineer's review comments will be summarized on a Submittal Review Form, which includes an action code. A description of each action code is provided below.
 - 1. No Exceptions Taken (Status 0 on shop drawing log). The shop drawing complies with the Contract Document requirements. No changes or further information are required. Where appropriate, the submittal review form will be used to alert the Contractor, Owner and Field personnel of remaining items within that specification section that still needs to be submitted.
 - 2. Make Corrections Indicated (Status 1 on shop drawing log). The shop drawing complies with the Contract Document requirements except for minor changes, as indicated. Engineer requires that all comments will be addressed by the Contractor, unless otherwise notified in writing prior to execution of the relevant work.
 - 3. Conditional to Remarks (Status 2 on shop drawing log). The shop drawing potentially complies with the Contract Document requirements, contingent upon satisfactory resolution of review comments. Remarks will explicitly list what information needs to be resubmitted. Resubmittal from the Contractor should include a cover letter or summary which indicates how each review comment has been addressed.
 - 4. Revise and Resubmit (Status 3 on shop drawing log). The shop drawing does not comply with the Contract Document requirement as submitted, but may with changes indicated and/or submission of additional information. The entire package must be resubmitted with the necessary information and a cover letter which indicates how each review comment has been addressed and where to find the information in the resubmittal.
 - 5. Rejected (Status 4 on shop drawing log). The shop drawing does not comply with the Contract Document requirements, for the reasons indicated in the remarks, and is unacceptable.
 - 6. For Information Only (Status 5 on shop drawing log). The shop drawing review was for information only.
 - 7. In Review (Status 6 on shop drawing log). The shop drawing is currently under review.

CONTRACTOR SUBMITTAL CERTIFICATION FORM

PROJECT:	CONTRACTO	OR'S PROJ. NO:
CONTRACTOR:	ENGINEER'S	PROJ. NO:
ENGINEER:		
SHOP DRAWING NUMBER:	SPECIFICATION SECTION OR DRAWING NO:	SEQUENTIAL NUMBER (& ALPHA SUFFIX FOR RESUBMITTAL)
DESCRIPTION:		
MANUFACTURER:		
material and/or equipr	nent meets or exceeds the project DEVIATIONS or COMPLETE LIST OF DEVIATION	ONS AS FOLLOWS:
	By:	
Date:	Date:	
-	contractor to correct, if so directed als	er for review and concurrence shall be
G	eneral Contractor's Stamp	

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

- Provide a detailed breakdown of the Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.
- B. Related Work Specified Elsewhere:
 - 1. Section 00700 General Conditions
 - 2. Section 00800 Supplemental Conditions
 - 3. Section 00844 Contractor's Application for Payment
 - 4. Section 01340 Submittals

1.2 PRICE AND PAYMENT PROCEDURES

A. General

- 1. The Schedule of Values shall consist of a detailed breakdown of all the Work within the Contract Documents and shall include a sufficient number of items to serve as an accurate basis for the Contractor's Application for Payment.
- 2. Each item shall include a directly proportional amount of the Contractor's overhead and profit and subcontractor markup, if applicable.

B. Lum Sum Items

- 1. Breakdown the Contract lump sum item values into components of the Work in sufficient detail to provide a basis for computing values for progress payments.
- 2. Identify each line item with the corresponding specification section or division.
- 3. For each major line item, list sub-items of major products or operations.
- 4. For items where payment of stored materials will be requested, break down the value into the cost of the materials, delivered and unloaded and the cost of installation.

C. Unit Price Items

- 1. List all unit price items with unit costs and quantities.
- 2. For items where payment of stored materials will be requested, break down the value into the cost of the materials, delivered and unloaded and the cost of installation.

1.3 SUBMITTALS

- A. Submit to the Engineer for review a proposed Schedule of Values a minimum of 21 days prior to submitting the first Application for Payment.
- B. The Schedule of Values shall be used as the basis for reviewing and approving payment requisitions along with determining percentages of work completed. No payment requisitions will be processed until the Engineer has taken no exceptions to the Schedule of Values.

1.1 QUALITY ASSURANCE

- A. The sum of each item breakdown shall equal the exact corresponding amount listed on the Bid Form. The sum of all items shall equal the exact corresponding Contract amount.
- B. When so required by the Engineer, provide copies of the subcontracts or other data acceptable to the Engineer substantiating the sums described.

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

- 1. Pre-Construction Record: Contractor shall take digital photographs and video to obtain a visual record of the project area prior to beginning any work at the project site.
- 2. Construction Progress: Contractor shall take digital photographs and video to obtain a visual record of the project area during the work at the project site.
- 3. Post-Construction Record: Contractor shall take digital photographs and video to obtain a visual record of the project area on completion of the work at the project site.
- 4. Notify Engineer at least three (3) working days prior to photographing or videoing the project area so Engineer may, at their option, observe.

1.2 QUALITY

- A. Pre-Construction Record: Quality shall be such that the condition of existing pavement, curbing, driveway entrances, sidewalks, walls, doors, equipment, piping, etc. can be readily determined. Pre-construction record photographs and videos shall be taken by the Contractor with the Engineer or RPR present.
- B. Construction Progress: Quality shall be such that the progress of the work is satisfactorily documented. Construction progress photographs may be taken by a professional photographer or may be taken by the Contractor.
- C. Post-Construction Record: Quality shall be such that the completion of the work is satisfactorily documented. Post-construction record photographs may be taken by a professional photographer or may be taken by the Contractor.
- D. Electronic files shall be high resolution digital images in *.jpeg format and shall not be compressed or downsized. Electronic files shall not be less 2MB in size

1.3 SUBMITTALS

- A. Pre-Construction Record:
 - 1. Submit pre-construction photographs/videos in accordance with Section 01340 prior to initiating any work on-site.
- B. Construction Record:
 - 1. Submit construction record photographs/videos in accordance with Section 01340 concurrent with the monthly payment requisition.
- C. Post-Construction Record:
 - 1. Submit post-construction record photographs in accordance with Section 01340 prior to final payment requisition.
- D. The quality of the photos and video are subject to approval by the Engineer.

E. Photographs and videos taken for the project and submitted are released to the Owner and Engineer for reproduction and use for records retention, governmental, commercial, and marketing purposes.

QUALITY CONTROL

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Quality Control.
- B. Workmanship.
- C. Manufacturer's Instructions.
- D. Manufacturer's Certificates.
- E. Manufacturer's Field Services.
- F. Testing Laboratory Services.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 QUALITY CONTROL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.4 <u>WORKMANSHIP</u>

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.5 MANUFACTURERS' INSTRUCTIONS

A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

1.6 MANUFACTURERS' CERTIFICATES

A. When required by individual Specifications Section, submit manufacturer's certificate that products meet or exceed specified requirements.

1.7 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, require supplier and/or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.
- B. Representative shall submit written report to Engineer listing observations and recommendations.

1.8 TESTING LABORATORY SERVICES

- A. Owner will employ and pay for services of an Independent Testing Laboratory to perform inspections, tests, and other services wherever an Independent Testing Laboratory is required by individual specification sections.
- B. Services will be performed in accordance with requirements of governing authorities and with specified standards.
- C. Reports will present observations and test results and indicate compliance or non-compliance with specified standards and with Contract Documents. Independent Testing Laboratory will submit one copy of each report directly to each of the following: Engineer, Resident Project Representative, Contractor. Reports will be submitted within 5 days of obtaining test results. If test results indicate deficiencies, Independent Testing Laboratory shall telephone or email results to Engineer, Resident Project Representative and Contractor within 24 hours.
- D. Contractor shall cooperate with Independent Testing Laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
- E. Contractor shall coordinate all testing work and shall notify Engineer and Independent Testing Laboratory at least 24 hours prior to performing work requiring testing services. If scheduled tests or sampling cannot be performed because the work is not ready as scheduled, testing costs associated with the delay will be paid by Contractor. If adequate notice is not provided, Contractor shall suspend work on that portion of the Project until testing can be performed. Such suspension will not be grounds for a claim against the Owner for delay, nor will it be an acceptable basis for an extension of time.
- F. Payment for Independent Testing Laboratory services shall be as follows:
 - 1. General: Testing which is the responsibility of the Contractor will be considered an incidental item unless otherwise indicated in Section 01150, Measurement and Payment.
 - 2. Initial Testing: Contractor will pay for initial tests.
 - 3. Retesting: Costs of retesting due to non-compliance will be paid by Contractor. The cost of retesting will be determined by the Engineer.
 - 4. Contractor's Convenience Testing: Inspections and tests performed for Contractor's convenience will be paid for by Contractor.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION Not Used

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included:
 - 1. Provide and pay for all temporary applicable utilities required to properly perform the Work at no additional cost to the Owner including the placement and removal of the utilities.
 - 2. Completely remove all temporary equipment and materials upon completion of the Work and repair all damage caused by the installation of temporary utilities.
 - 3. Make all necessary applications and arrangements for electric power, light, water and other utilities with the local utility companies. Notify the local electric power company if unusually heavy loads, such as welders, will be connected.

1.2 **QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies:
 - 1. Obtain permits as required by local governmental authorities.
 - 2. Obtain easements, when required, across private property other than that of the Owner for temporary power service.
 - 3. Comply with the latest National Electrical Code.
 - 4. Comply with all local, State and Federal codes, laws, and regulations.
- B. All temporary utilities are subject to the approval of the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Electrical:

- 1. The General Contractor shall make necessary arrangements with the local power company for connection to the existing power supply and shall provide and pay for all temporary light and power requirements except as otherwise specified hereunder. In general, the temporary electrical service shall include all necessary switches, poles, wiring, cables, conduit, raceways, panelboards, fixtures, lamps and receptacles to supply construction power of adequate capacity for the project. Temporary transformers and meters shall be furnished and installed by the appropriate power authority, but paid for by the General Contractor, who shall be responsible for making all arrangements for their installation prior to using any existing power for temporary purposes.
- 2. Use new or used materials adequate in capacity for the purposes intended.
- 3. Materials must not create unsafe conditions or violate the requirements of applicable codes.

4. Conductors:

- a. Wire, cable or busses of appropriate type, sized in accordance with the latest National Electrical Code for the applied loads.
- b. Use only UL approved wire.
- 5. Conduit:
 - a. Rigid steel, galvanized: ANSI C80.1.
 - b. Electrical metallic tubing: ANSI C80.3.
 - c. Other material approved by NEC.
- 6. Equipment: Provide appropriate enclosures for the environment in which used in compliance with NEMA Standards.
- 7. The General Contractor will pay for the cost of energy consumed by all trades, including cost of lamp replacement. The General Contractor and Subcontractors of all trades shall furnish their own extension cords and such additional lamps as may be required for their work, shall pay for the cost of temporary wiring of a special nature for light and power required, other than that above mentioned.
- 8. All temporary work shall be furnished and installed in conformity with the National Electrical Code and in accordance with local ordinances and requirements of the municipal power authority. All temporary wiring and accessories shall be removed after it has served its purpose.

B. Weather Protection

- 1. The Contractor's attention is directed to M.G.L. Chapter 149, §44G(d), and to "Weather Protection Standards" established by the Deputy Commissioner of the Massachusetts Division of Capital Asset Management and Maintenance.
 - a. It is the intent of these Specifications to require the Contractor to provide temporary enclosures and heat to permit construction work to be carried on during November through March in compliance with M.G.L. Chapter 149, §44G(d). These Specifications are not to be construed as requiring enclosures or heat for operations that are economically not feasible in the judgment, in writing, of the Contractor. Included in this category, but without limitation, are such items as site work, excavation, roofing, and similar operations.
 - b. "Weather Protection" shall mean the temporary protection of that work adversely affected by moisture, wind, and cold, by covering, enclosure, and/or heating. This protection shall provide adequate working areas during November through March, inclusive as determined by the Contractor and consistent with the approved construction necessary to maintain an orderly and efficient sequence of construction operations. The Contractor shall furnish and install all weather protection materials required for the Work or any part thereof, and shall be responsible for all costs, including heating required to maintain a minimum temperature of 40 degrees F. at the working surface. This provision does not supersede any specific requirements for methods of construction and/or curing of materials.

c. Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate ventilation and fire protection devices.

C. Water and Sanitary:

- 1. The General Contractor shall make necessary arrangements for connection to the municipal water supply and shall provide, at their own expense, any extensions as required for the operation of this project. The General Contractor shall bear all costs incurred for the temporary water services, including the costs of the water itself.
- 2. All lines, temporary or permanent, shall be protected and maintained by the General Contractor. Temporary lines shall be removed by the General Contractor when the temporary service is no longer required.
- 3. The General Contractor shall provide an adequate drinking water supply, satisfactorily cooled, for their employees.
- 4. See Site Plan for nearest water hook-up.
- 5. The General Contractor shall furnish, install, maintain and pay for adequate temporary chemical type toilet accommodations, for all persons employed on the work and located where approved by the Engineer. The accommodations shall be in proper enclosures and in accordance with Municipal Ordinances and shall be maintained in proper, safe and sanitary conditions and suitably heated when requested.
- 6. Relocate temporary toilet facilities as required to facilitate the construction.
- 7. Remove all temporary facilities at completion of work when directed by the Engineer.

PART 3 - EXECUTION

3.1 PERFORMANCE

A. Electrical:

- 1. Provide electrical energy to:
 - a. All necessary points on the construction site so that power can be obtained at any desired point with extension cords no longer than 100 feet.
 - b. Construction site offices.
 - c. Lighting as required for safe working conditions at any location on the construction site.
 - d. Night security light.
 - e. When applicable, Owner's present facilities during the changeover of electrical equipment.
- 2. Maintain electrical energy throughout the entire construction period.
- 3. Capacity:
 - a. Provide and maintain adequate electrical service for construction use by all trades during the construction period at the locations necessary, as specified herein.
- 4. Installation:
 - a. Install all work with a neat and orderly appearance.
 - b. Have all installations performed by a qualified electrician.

- c. Modify service as job progress requires.
- d. Locate all installations to avoid interference with cranes and materials handling equipment, storage areas, traffic areas and other work.

B. Heating and Ventilation:

1. Maintain a heated and ventilated environment for the work at the temperature and for the length of time specified or as directed by the Engineer, and as needed to protect all individuals on the construction site.

2. Precaution:

- a. Operate temporary heating apparatus in such a manner that finished work will not be damaged.
- b. Repair all damage caused by temporary heating operations, to the complete satisfaction of the Engineer.

C. Weather Protection

- 1. The Contractor shall be entirely responsible for all weather protection during the Contract Time and shall be liable for any damage to the Work, or any part thereof caused by the Contractor's failure to supply adequate and proper weather protection.
- 2. Any work damaged by frost shall be promptly removed and replaced by the Contractor at no increase in Contract Price or Contract Time.

D. Water:

1. Provide and maintain water for drinking and construction purposes as required for the proper execution of the Work.

E. Sanitary Accommodations:

- a. Provide and maintain sanitary accommodations for the use of the employees of the General Contractor, subcontractors, and Engineer.
- b. Sanitary accommodations shall meet the requirements of all local, State and Federal health codes, laws, and regulations.

DUST CONTROL

PART 1 - GENERAL

1.1 DESCRIPTIONS

- A. Work Included:
 - 1. Furnish and apply water or calcium chloride on the road surfaces within the construction site, when required to control dust and when directed by the Engineer.
 - 2. When dust control is not included as a separate item in the Contract, the work shall be considered incidental to the appropriate items of the Contract.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Water for Sprinkling:
- B. Clean, free of salt, oil, and other injurious matter.
- C. Calcium Chloride:
 - 1. Meet the requirements of AASHTO M144.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Water:
 - 1. Apply water by methods approved by the Engineer.
 - 2. Use approved equipment including a tank with gauge equipped pump and spray bar.

B. Calcium Chloride:

- 1. Apply at a rate sufficient to maintain a damp surface but low enough to assure non-contamination of water courses.
- 2. Apply water prior to calcium chloride addition.

TRAFFIC REGULATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

- 1. Contractor shall provide a site specific Traffic Management Plan for Westford Circle. Contractor must obtain a Springfield DPW permit approval for the Traffic Management Plan.
- 2. Provide all materials and perform all work necessary to completely regulate traffic in the area of Work.
- 3. Perform all work in such a manner as to provide safe passage at all times for the public and with a minimum of obstruction to traffic.
- 4. Do not close roads or streets to passage of the public without the permission of the proper authorities.
- 5. Uniformed officers with vehicles (including police officers when required by law, regulations, ordinances, or as a result of poor traffic control) shall be obtained and paid for by the Contractor (police vehicle for uniformed officers is optional).
- B. The local police department and/or the appropriate state transportation authority who will decide if safe passage is being maintained and shall have the authority to require the Contractor to take any additional steps necessary to maintain safe passage. If the Authority furnishes an inspector on the job or requires additional traffic control as a result of poor traffic control by the Contractor, the Contractor shall be responsible for all costs assessed by the Authority and for additional traffic control at their own expense. Minimize the length of delays or traffic stoppage to the extent practicable. Maximum traffic stoppage time shall be 10 minutes.
- C. The Contractor's designated traffic control representative shall respond to all traffic safety complaints and be available to direct traffic control subcontractors the entire time work is occurring on site. If the designated representative is not on site for a period of time, another on site representative shall be designated by the Contractor for that period.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1 and Plans.

1.3 SCHEDULING WORK

- A. During the Project Pre-Construction Meeting one Contractor representative will be designated as the coordinator between the Police Department and subcontracted traffic control.
- B. Do not start work in any new location without the permission of the Engineer.
- C. Notify all police and fire departments of all scheduled detours and when streets are reopened.

PART 2 - PRODUCTS

2.1 WARNING SIGNS AND BARRICADES

- A. Traffic control (plans, methods and devices) shall be as outlined in the MUTCD as published by U. S. Department of Transportation, and any local and state requirements.
- B. Provide adequate warning signs, barricades, signal lights, flaggers/uniformed police officers, and take other necessary precautions for the safety of the public.
- C. Provide and illuminate suitable warning signs to show where construction, barricades or detours exist.
- D. Provide barricades of substantial construction and painted with a finish that increases visibility at night, as outlined in the MUTCD.
- E. Keep signal lights illuminated at all barricades and obstructions from sunset to sunrise.
- F. Maintain all necessary signs, barricades, lights, flaggers, crew and other safety precautions during authorized suspension of the Work, weekends, holidays or other times when the Work is not in progress.
- G. Contractor shall make periodic inspection throughout the day of the traffic control patterns, methods, signs and other devices to ensure that they are properly placed.

2.2 UNIFORMED POLICE OFFICER

- A. A uniformed police officer is a police officer (local, county or state) on regular or special duty dressed in uniform with the necessary high visibility vest and apparel needed for traffic control.
- B. Arrange the police detail with the local Chief of Police, County Sheriff, or State Police Captain depending on jurisdiction.

PART 3 - EXECUTION

3.1 DETOURS

- A. Shall be provided for as specified in the Plans
- B. Provide, identify and maintain suitable detours when the project, or any part thereof, is closed to public travel.
- C. When the closed part of the project is reopened, restore the detour area and any other disturbed areas to the original condition.

3.2 INCONVENIENCE TO RESIDENTS OF VICINITY

- A. Whenever a traveled way is closed, perform the Work in such a manner that local travel, residents and businesses in the vicinity of the Work will be inconvenienced as little as possible.
- B. Allow access to residents and abutting land owners along the project to driveways and other normal outlets from their property.

3.3 TRAFFIC CONTROL OFFICERS

A. Where required by the local, county or state police departments and/or when specified, traffic control officer shall be Uniformed Police Officers.

B. Where the local, county or state police departments do not wish to or are unable to furnish traffic control officers and/or when specified, the traffic control officers shall be flag person.

DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the work. An updated storage and delivery log is required to be submitted with the monthly payment requisition prior to approval. An example log is included in this section.

1.2 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with manufacturer's instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than 120 days prior to installation without written authorization from the Engineer.
- C. Ship equipment, material and spare parts complete except where partial disassembly is required by transportation regulations or for the protection of components.
- D. Pack spare parts in containers bearing labels clearly designating contents and pieces of equipment for which intended, including cross reference of the applicable contract specification section.
- E. Deliver spare parts at the same time as pertaining equipment. Deliver spare parts to the Owner after completion of work.
- F. Deliver products to the site in manufacturer's original sealed containers or other packing system, complete with instructions for handling, storing, unpacking, protecting and installing.
- G. Instructions for handling, storing, unpacking, protecting and installing equipment shall be included in the Equipment O&M Manuals, which shall be submitted prior to the equipment being shipped to the site. This information shall be filed in a dedicated three ring binder(s) on-site, in the Contractor trailers, accessible to the Owner and Engineer. The binder(s) shall be clearly labeled, and include dividers for each specification section. The manufacturer-provided instructions for each equipment item shall be labeled with the specification number, equipment name, and equipment number. The instructions shall also be submitted to the Engineer.
- H. Assume responsibility for equipment material and spare parts just before unloading from carrier at site.
- I. All items delivered to site shall be unloaded and placed in a manner which will not hamper the Contractors normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- J. Provide equipment and personnel to unload all items delivered to the site.
- K. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify the Engineer in writing of any problems.
- L. Pay all demurrage charges if failed to promptly unload items.

1.3 STORAGE AND PROTECTION

- A. Store and protect products and equipment in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instructions shall be studied by the Contractor and reviewed with the Engineer by them. Instructions shall be carefully followed and a written record of this kept by the Contractor for each product and pieces of equipment.
- B. Arrange storage of products and equipment to permit access for inspection. Periodically, inspect to make sure products and equipment are undamaged and are maintained under specified conditions.
- C. Provide protective maintenance during storage consisting of manually exercising equipment, inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer necessary for its protection and all other precautions to assure proper protection of all equipment stored and for compliance with manufactures requirements related to warranties.
- D. Store loose granular materials on a solid flat surface in a well-drained area. Prevent mixing with foreign matter.
- E. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease, and in a position to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking and spalling to a minimum.
- F. Temporary heating and cooling is acceptable. Equipment shall be protected from environmental effects as required by the manufacturer and dependent on the season. Equipment that arrives on site without coating shall be protected from environmental impacts through coating or protection at the contractors' expense. Any equipment that displays defects or corrosion from environmental impacts will not be accepted for installation.
- G. The location of all stored material and equipment shall be reviewed with the Owner and Engineer. The Owner and Engineer may request that equipment and material be moved to an alternate location to accommodate plant maintenance and operation, or if the location is deemed unacceptable or unsuitable.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.1 <u>DELIVERY, STORAGE, AND HANDLING MONTHLY LOG</u>

- A. An updated storage and delivery log is required to be submitted with the monthly payment requisition prior to approval.
- B. The monthly log shall include the specification section, equipment description, equipment tagging, submittal approval date, date of equipment delivery, date of O&M submittal, contractor start-up sign-off, certified equipment testing date, operator training date, spare parts turnover date, required maintenance (activity and date), and equipment turnover (Owner's witness and date).

3.2 STORAGE AND PROTECTION

- A. Equipment requires acceptance and verification of the storage from the Owner, Engineer, Manufacturer and Contractor at the Engineers discretion.
- B. Following delivery, the equipment warranty from the Manufacturer is the responsibility of the Contractor.
- C. All storage and maintenance will be the responsibility of the Contractor, conducted at the Contractors expenses and verified by the Engineer.
- D. It is the Contractors responsibility to coordinate all storage requirements on site as required by the Manufacturer to achieve acceptance.

Section 01600 Delivery, Storage and Handling

Specification Section	Equipment Description	Equipment Tags	Submittal Approved	Date of Equipment	Date of O&M	Equipment Start-Up ²		Certified Equipment Testing	Operator Training	Spare Parts Turnover	Required Maintenance by Contractor	Equipment Turnover	
	•			Delivery ¹	Submittal	Date	Witness	Date	Date	Date	(activity & date)	Owner's Witness	Date
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¹ If equiment is delivered and placed in storage, all steps for Stored Equipment shall be followed and tracked separately

² Log weekly start-ups of installed equipment, performed by Contractor, until Equipment Turnover

PROJECT CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

- 1. Maintain premises and public properties free from accumulations of waste, debris, and rubbish, caused by operations.
- 2. At completion of work, remove waste materials, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces. Leave project clean and ready for use.

1.2 REQUIREMENTS SPECIFIED ELSEWHERE

A. Additional Requirements are specified elsewhere including, but not necessarily limited to, General Conditions, Supplementary Conditions, and Division 1.

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Conduct cleaning and disposal operations in accordance with all applicable local and state laws, ordinances, and code requirements.

PART 2 - PRODUCTS

2.1 <u>MATERIALS</u>

- A. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturers.

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Cleaning During Construction:
 - 1. Execute cleaning operations to ensure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
 - 2. Entirely remove and dispose of material or debris during the progress of the work that has washed into or has been placed in watercourses, ditches, gutters, drains, catch basins, or elsewhere as a result of the Contractor's operations.
 - 3. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
 - 4. At reasonable intervals during the progress of work, clean the site and dispose of waste materials, debris, and rubbish.
 - 5. Clean interiors of buildings, when applicable, prior to finish painting, and continue to clean on an as-needed basis until buildings are ready for occupancy.
 - 6. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw material from heights.

7. When applicable, schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces.

B. Control of Hazards:

- 1. Store volatile wastes in covered metal containers, and remove from premises daily.
- 2. Prevent accumulation of wastes which may create hazardous conditions.
- 3. Provide adequate ventilation during use of volatile or noxious substances.

C. Disposal:

- 1. Do not burn or bury rubbish and waste materials on project site.
- 2. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
- 3. Do not dispose of wastes into streams or waterways.

D. Final Cleaning:

- 1. Employ experienced workers, or professional cleaners, for final cleaning.
- 2. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from all sight-exposed interior and exterior finished surfaces.
- 3. Repair, patch and touch up marred surfaces to specified finishes.
- 4. Broom clean paved surfaces.
- 5. Rake clean non-paved surfaces of the project site.
- 6. Restore to their original condition those portions of the site not designated for alterations by the Contract Documents.

TEMPORARY CONSTRUCTION DEWATERING SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included:
 - Design, furnish, operate, maintain, and remove temporary dewatering system
 to lower and control ground water table levels and hydrostatic pressures to
 permit excavation, backfill, and construction to be performed in the dry; collect
 and dispose of ground and surface water where necessary to complete the work.
- B. Related Work Specified Elsewhere: (When Applicable)
 - 1. Section 02200 Earthwork

1.2 DESIGN REQUIREMENTS

- A. Dewatering system shall be of sufficient size and capacity necessary to lower and maintain ground water table to an elevation at least **one** feet below the lowest foundation subgrade or bottom of pipe trench to allow material to be excavated in a dry condition. Materials to be removed shall be sufficiently dry to permit excavation to grades shown and to stabilize excavation slopes where temporary excavation support systems are not required. Operate dewatering system continuously until backfill work has been completed.
- B. Control of surface and subsurface water is part of the Temporary Construction Dewatering System requirements. Maintain adequate control so that:
 - The stability of excavated and constructed slopes are not adversely affected by saturated soil, including water entering the prepared subbase and subgrades where underlying materials are not free draining or are subject to swelling or freeze-thaw action.
 - 2. Erosion is controlled.
 - 3. Flooding of excavations or damage to structures does not occur.
 - 4. Surface water drains away from excavations.
 - 5. Excavations are protected from becoming wet from surface water and ensure excavations are dry before additional work is undertaken.
 - 6. Prevent loss of fines, seepage, boils, quick conditions or softening of foundation strata.
 - 7. The stability of the sides and bottom of excavations are sustained during excavations. Construction operations shall be performed to dry and stable soils.
 - 8. Any existing dewatering wells that can affect dewatering and excavation shall be sealed below the excavation subgrade.

1.3 QUALITY ASSURANCE

A. The Temporary Construction Dewatering System shall be installed, operated and monitored by the Contractor or a specialty subcontractor specializing in and having experience installing and operating dewatering systems in similar subsurface conditions for at least 5 years.

B. Well drillers, if required, shall be licensed in the State of Massachusetts.

1.4 SUBMITTALS

- A. Provide submittals in accordance with Specification Section 01340.
- B. Submittals under this Section shall be provided concurrently with and coordinated with the submittals under Section 02156 (Temporary Excavation Support Systems).
- C. Submit monitoring results at the frequency required by the permitting authority.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment used in the Temporary Construction Dewatering System shall adhere to accepted industry standards.
- B. Backup equipment for the Temporary Construction Dewatering System shall be identical to the primary equipment, shall be immediately available and in operating condition at all times.
- C. Pipes and Well Screens: Schedule 40 PVC or stronger.
- D. Sand: Clean, single-size filter sand having an effective size (D10) of 0.3 to 0.5 mm with a fineness modulus of less than 4 and with no more than 4% passing a 100 sieve.
- E. Grout: Cement-bentonite grout of adequate mix proportion and consistency. Seals shall consist of bentonite pellets.
- F. Pumps, meters, hoses and controls shall be suitable for the intended purpose and application.

PART 3 - EXECUTION

3.1 <u>PERFORMANCE</u>

A. General:

- 1. Prior to any excavation below the ground water table, place system into operation to lower water table as required and operate it continuously 24 hours a day, 7 days a week until utilities and structures have been satisfactorily constructed, which includes the placement of backfill materials and dewatering is no longer required.
- 2. Keep work areas dewatered until the structures, pipes, and appurtenances to be built there have been completed to such an extent that they will not be damaged by water.
- 3. Thoroughly brace or otherwise protect against flotation all pipelines and structures which are not stable.
- 4. Maintain standby backup equipment and power supply throughout the duration of the dewatering operation.
- 5. Prevent soil particles from entering the discharge points.
- 6. Ground water level shall be maintained at least **one foot** below the bottom of the excavation.

B. Disposal of Water:

1. Dispose of water pumped or drained from the construction site in a suitable manner to avoid siltation of adjacent drainage structures and piping, wetlands

- or water bodies, injury to public health, damage to public and private property, and damage to the work completed or in progress.
- 2. Provide suitable temporary channels for water that may flow along or across the construction site.
- 3. Provide treatment as necessary to prevent discharge of contaminated ground water caused by Contractor's operations or any contaminated ground water that may pass through the Temporary Construction Dewatering System.
- 4. Contractor must obtain all necessary regulatory approvals for the disposal of dewatering flows. These may include, among others, approval by the USEPA under the National Pollutant Discharge Elimination System (NPDES) program for construction activities.

C. Damage:

- 1. Avoid damage to and settlement of adjacent buildings, roads, structures, utilities and other facilities.
- 2. Any damage to or settlement of structures resulting from the dewatering operations, or the failure of the Contractor to maintain the work in a suitably dry condition shall be repaired by the Contractor at no additional cost to the Owner.

D. Temporary Underdrains:

- 1. When necessary, temporary underdrains may be placed in excavations.
- 2. Underdrain pipe shall be perforated corrugated metal, polyethylene or P.V.C. pipe.
- 3. Surround the underdrain completely and fill the space between the underdrain and the pipe or structure with free draining material.

E. Excavation Sump Pumping:

- 1. When necessary, and where appropriate to the geotechnical conditions encountered, excavations may be over excavated 12 to 24-inches and filled with screened stone to allow sump pumping of groundwater. Immediately cease operations if boils, loss of fines, quick conditions, softening of the ground or instability of slopes occur.
- 2. The system shall be installed with suitable screens and filters so that pumping of fines does not occur.

3.2 MONITORING

A. General:

- 1. Contractor shall monitor the performance of the dewatering system and the groundwater level achieved throughout construction.
- 2. Contractor shall monitor the effluent quality from the treatment system as required by the permitting authority.

3.3 CORRECTIVE ACTION

- A. No movement of or damage to adjacent buildings, roads, structures, utilities and other facilities shall be allowed.
- B. If dewatering requirements are not satisfied due to inadequacy or failure of the dewatering system (loosening of the foundation strata, or instability of slopes, or damage to foundations or structures), the Contractor shall stop work and consult with the Design Engineer and resubmit a revised Temporary Construction Dewatering

System design submittal. The revised plan shall indicate why the system revisions are needed and indicated what change will be made to address the issues. Contractor shall perform work necessary for reinstatement of foundation soil and damaged structure resulting from such inadequacy or failure by Contractor, at no additional cost to the Owner.

C. Damage to existing structures shall be repaired at no additional cost to the Owner.

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CERTIFICATE OF DESIGN

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			CONTRACTOR:	(Name)				
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TEMPORARY EXCAVATION SUPPORT SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Design, furnish, install, maintain, and remove temporary excavation support system as required to comply with all applicable State and Federal regulations including the Occupational Safety and Health Act. Excavation support system shall consist of steel sheeting, pile and lagging bracing or other systems designed by the Contractor.
- B. Related work specified Elsewhere (When Applicable):
 - 1. Section 02200 Earthwork
 - 2. Section 02140 Temporary Construction Dewatering System

1.2 DESIGN REQUIREMENTS

- A. The Contractor shall be responsible for the design and construction of the excavation support structures. The excavation support structures (sheeting systems or other special excavation techniques) shall be properly designed by a Professional Engineer registered in the State in which the project is located, who practices in a discipline applicable to excavation work and has more than 5 years of experience in the design of excavation support systems. The excavation support system shall be designed to accommodate an additional 2 feet of excavation below the bottom of excavation shown on the Contract Drawings.
- B. The excavation support system shall be designed and installed to limit the upward hydraulic gradient into the bottom of the excavation and to sustain all existing and expected loads and utilities, to prevent migration of fine-grained materials into the excavation, to prevent all movement to earth which could in any way cause injury to workmen, delay the work or endanger adjacent structures. If detrimental effects result from construction activities, the Contractor shall modify the design, revise construction procedures and/or take measures to mitigate and abate further movement at no cost to the Owner.
- C. The Contractor shall prepare an excavation support system monitoring plan intended to monitor the performance of the excavation support system, as well as the adjacent grade and adjacent structures, throughout construction. The excavation support system monitoring plan shall include vibration and deformation monitoring. The Contractor shall retain the services of a qualified vibration monitoring consultant to perform vibration monitoring during installation and removal of the excavation support system. Refer to Paragraphs 1.3 and 3.4 for additional requirements.
- D. The internal lateral bracing shall be located so that the braces shall not pass through walls and/or slabs of existing or proposed structures.
- E. The support system shall provide adequate room to properly perform the installation and to allow for inspection of the installation.
- F. Prior to the installation of any portion of the temporary lateral support system, the Contractor shall furnish to the Owner precondition surveys documenting the existing

- conditions of the adjacent structures.
- G. The use of existing structures to support the sheeting bracing or structural framing shall be prohibited.

1.3 SUBMITTALS

- A. Provide submittals in accordance with Specification Section 01340.
- B. Submit qualifications of temporary excavation support system design engineer.
- C. Submit attached certificate of design and complete scaled and dimensioned layout drawings of the proposed excavation system, stamped and sealed by a Professional Engineer registered in the State in which the project is located. Drawings shall show plan, sections and elevations of the support system as well as the proposed structures. Submittal shall identify:
 - 1. Physical location on the site and identify any existing utilities, site piping, site electrical conduit that must be relocated prior to excavation support system installation.
 - 2. Type and location of any surcharge loads adjacent to the excavation support system required by the Contractor to execute the work (e.g., excavators, trucks, cranes, soil piles, etc.).
 - 3. Design calculations, supporting documentation and materials cut sheets.
 - 4. Sample monitoring log.
 - 5. System removal requirements.
- D. Submit excavation support system monitoring plan, including qualifications of Contractor's vibration monitoring consultant and Contractor's surveyor. The excavation support system monitoring plan shall identify: the specific method, location and frequency of measurements (pre-, during and post-construction); individual(s) responsible for inspection/measurements; submittal and maintenance of on-site records; and threshold vibration values and excavation support system deformation values that, if exceeded, will require immediate stoppage of work and the performance of repairs necessary for reinstatement of a functional system. Provide justification for recommended vibration and deformation tolerances, on a structure-by-structure basis.
- E. The Contractor shall have sole responsibility for design, construction, monitoring and removal of the excavation support system as necessary to prevent damage to adjacent structures, utilities, streets adjacent to excavations and for safety of persons working within the excavated areas. The submittals will be reviewed for consistency with the design intent.
- F. Submittals under this Section shall be provided concurrently with and coordinated with the submittals under Section 02140 (Temporary Construction Dewatering System).

PART 2 - PRODUCTS

2.1 <u>MATERIAL</u>

A. All materials shall conform to all applicable State and Federal regulations including the Occupational Safety and Health Act.

PART 3 - EXECUTION

3.1 <u>GENERAL REQUIREME</u>NTS

- A. Perform preparatory work to discover, protect, maintain and restore utilities, foundations or other facilities located in close proximity of the proposed excavation lateral support system.
- B. Conduct pre-excavation to remove obstructions along the alignment of the excavation lateral support system which will interfere with installation of the excavation lateral support system.
- C. Install the excavation support system, including the installed wall and bracing system, outside the limits of the permanent structure. Construction tolerances (e.g., wall verticality) and lateral wall deflections as a result of excavation and other activities shall be considered in determining the plan location.
- D. Excavation shall not proceed more than 2 ft. below the bracing level, anywhere within the excavation support limits, until the entire level of bracing is completely installed.
- E. The first level of bracing shall be installed within 5 ft. of the ground surface prior to any excavation below this level.

3.2 INSTALLATION

A. Install excavation support system in accordance with all applicable State and Federal regulations including the Occupational Safety and Health Act. The excavation support system design engineer shall visit the site during excavation support system installation.

3.3 <u>INTERNAL LATERAL WALL BRACING (RAKERS, WALES AND STRUTS)</u>

- A. Rakers are only allowed for the temporary lateral brace that is installed within 5 ft. of the ground surface.
- B. Use wales, struts, corner braces to provide support of the excavation lateral support walls as required. Include web stiffeners, plates, brackets, or angles as required to prevent rotation, crippling or buckling of connections and points of bearing between structural steel members. Allow for eccentricities due to fabrication and assembly. Consider effects of temperature changes.
- C. Install and maintain all support members in continuous tight contact with each other and with the wall being supported.
- D. Preload all bracing members (including rakers, corner braces, and struts) in accordance with methods, procedures and sequence as described on the reviewed shop drawings. Coordinate excavation work with installation of bracing and preloading. Use steel shims and steel wedges, welded or bolted in place, to maintain the preloading force in the bracing after release of the jacking equipment pressure. Wood shims or wedges shall not be used. Braces shall be preloaded to 50 percent of the maximum design load. Provide means to control the fluctuation of loading due to temperature variations.
- E. Accomplish preloading by jacking struts, rakers, etc. in place against the excavation lateral support system walls, or by other methods acceptable to the Owner or Owner's Representative.

3.4 MONITORING

- A. Contractor shall implement the excavation support system monitoring plan intended to monitor the performance of the excavation support system, as well as adjacent grade and adjacent structures, throughout construction. Monitoring shall include the following at a minimum:
 - 1. Pre-Installation Structure Elevation Survey. Conduct survey prior to excavation support system installation.
 - 2. Vibration monitoring (full time) during excavation support system install.
 - 3. Installation Structure and Support System Surveys. Conduct surveys after excavation support system installation but prior to first brace installation; at mid-point of excavation; and at bottom of excavation. Conduct surveys at weekly intervals during structure construction. Conduct survey prior to excavation support system removal. Each survey shall assess the support system deformation and key structures.
 - 4. Vibration monitoring (full time) during excavation support system removal.
 - 5. Post-Installation Structure Survey. Conduct survey after removal of excavation support system.
- B. The excavation support system design engineer shall visit the site during the monitoring program at periodic intervals.
- C. Additionally, if the excavation support system monitoring criteria/requirements are not satisfied due to inadequacy or failure of the excavation support system (settlement of adjacent grade, settlement of structures, cracking of structures, etc.), immediately stop work and perform repairs necessary for reinstatement of a functional system, as well as restoration of foundation soil and damaged structure resulting from such inadequacy or failure by Contractor, at no additional cost to Owner.

3.5 REMOVAL OF SHEETING

- A. Remove all sheeting and bracing unless the removal may cause injury to adjacent structures and/or property.
- B. The General Contractor shall be responsible for repairing all damage to existing structures caused by the removal of sheeting. The excavation support system design engineer shall visit the site during excavation support system removal.
- C. All backfill disturbed by the removal of the sheeting shall be re-compacted to its insitu density.
- D. Proceed with backfilling as specified in these Specifications. When the level of compacted backfill reaches the location of bracing and wales, remove these items from the trench or other excavation. When the level of the backfill reaches a point three feet below the existing ground grade, remove the sheeting by approved methods and equipment.
- E. After removing the sheeting, complete backfilling in the usual manner.
- F. If the Contractor elects to leave the sheeting or any component of the temporary support system in place, the Contractor shall cut the sheeting or such component at least 4 feet below the ground surface, or as directed by the Engineer.

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CERTIFICATE OF DESIGN

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	and	CONTRACTOR			(Name)
	on	CONTRACTOR:			(Name)
	Oll	CONTRACT:			(Title)
			(Number)		(Date)
The	undersigned her	reby certify that the eng	gineer listed below:		
1.	Is licensed or reg	gistered to perform pro(loca	fessional engineering ation of Project);	g work in	the state of
2.	Is qualified by ea	ducation and training to	o design the		
	specified in Sect	ion	of subject	contract;	
3.	Has previously d	lesigned comparable ex	xcavation support sys	stems;	
		ws, regulations, rules, a	_		abject contract, including nd coordination with the
	place system to c	-	is installed and funct	ions in ac	em, will monitor the incordance with the design system.
CO	NTRACTOR				ENGINEER
By:				By: _	
	(Signature)				(Signature)
	(Name)				(Name)
	(Title)				(Engineering Discipline)
	(Date)				(Date)

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Refer to the following specifications for earthwork materials, as provided as an Appendix to this Project Manual. The content of this section supplements these requirements.
 - 1. Springfield Water and Sewer Commission Guidelines and Policies Water Infrastructure Improvements Liberty Street and Westford Circle
 - 2. Springfield Water and Sewer Commission Material Specifications Water Infrastructure Improvements Liberty Street and Westford Circle
 - 3. Springfield Water and Sewer Commission Guidelines and Policies Detail Drawings
 - 4. Springfield Department of Public Works Standard Engineering Details.

1.2 REFERENCE STANDARDS

- A. Massachusetts Department of Transportation "Standard Specifications for Highways and Bridges", dated 1988.
- B. Massachusetts Department of Transportation "Supplemental Specifications to the 1988 English Standard Specifications for Highways and Bridges", dated April 1, 2019. These supplemental specifications and 1988 Standard Specifications for Highways and Bridges will be jointly referred to as the Mass DOT Standard Specifications.

1.3 DESCRIPTION

- A. The Work described by this Section consists of all earthwork encountered and necessary for construction of the project as indicated in the Contract Documents, and includes but is not limited to the following:
 - 1. Excavation
 - 2. Backfilling and Filling
 - 3. Compaction
 - 4. Embankment Construction
 - 5. Grading
 - 6. Providing soil material as necessary
 - 7. Disposal of unsuitable materials
 - 8. Disposal of excess suitable material
- B. Related Work Specified Elsewhere: (When Applicable)
 - 1. General Requirements in Division 1
 - 2. Site Work in Division 2

1.4 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

- 1. All work shall be performed and completed in accordance with all local, state and federal regulations.
- 2. The General Contractor shall secure all other necessary permits unless otherwise indicated from, and furnish proof of acceptance by, the municipal and state departments having jurisdiction and shall pay for all such permits, except as specifically stated elsewhere in the Contract Documents.

B. Line and Grade:

1. The Contractor shall establish the lines and grades in conformity with the Drawings and maintain same to properly perform the work.

C. Testing Methods:

1. Gradation Analysis: Where a gradation is specified the testing shall be in accordance with ASTM C117 and ASTM C136 (or latest revision).

2. Compaction Control:

- a. Unless otherwise indicated, wherever a percentage of compaction for backfill is indicated or specified, it shall be the in-place density divided by the maximum density and multiplied by 100. The maximum density shall be the density at optimum moisture as determined by ASTM Standard Methods of Test for Moisture-Density Relations of Soil Using 10-lb. Hammer and 18-in. Drop, Designation D1557 (Modified Proctor), or latest revision, unless otherwise indicated.
- b. The in-place density shall be determined in accordance with ASTM Standard Method of Test for Density of Soil in Place by the Sand Cone method, Designation D1556, (or latest revision) or Nuclear method Designation D6938.
- c. Wherever specifically indicated, maximum density at optimum moisture may be determined by ASTM Standard Methods of Test for Moisture Density Relations of Soils, ASTM D6938 (Standard Proctor).
- d. An Independent Testing Laboratory will be retained by the Owner to conduct all laboratory and field soil sampling and testing, and to observe earth work and foundation construction activities. Laboratory testing will consist of sieve analyses, natural water content determinations, and compaction tests. Field testing will consist of in-place field density tests and determination of water contents.

1.5 SUBMITTALS

- A. Collection of samples and testing of all materials for submittals shall be performed by the Independent Testing Laboratory and paid for by the Contractor until the materials are approved by the Owner or Engineer.
- B. Submit test results in accordance with the procedure specified in the General and Supplementary Conditions.
- C. Submit test results (including gradation analysis) and source location for all borrow material to be used at least 10 working days prior to its use on the site. Contractor shall identify and provide access to borrow sites.
- D. Submit moisture density curve for each type of soil (on site or borrow material) to be used for embankment construction or fill beneath structures or pavement.

1.6 TESTS

- A. The Independent Testing Laboratory shall conform to the procedures and standards listed below. Submit test results in accordance with the procedure specified in the General and Supplementary Conditions.
- B. All testing shall be performed by a qualified Independent Testing Laboratory acceptable to the Engineer and Contractor at the Owner's expense unless otherwise indicated (see Section 01400 Quality Control).
- C. Field density tests on embankment materials shall be as follows:
- D. Tests shall be taken on every 200 cubic yards of embankment material.
- E. Paved Areas and Building Slab Subgrade: Make at least one field density test of subgrade for every 2,000 sq. ft. of paved area or building slab, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case less than 3 tests.
- F. Trenches: Field density test in trenches shall be taken at 75 linear foot intervals on every third lift.
- G. Foundation Wall Backfill: Take at least one (1) field density tests per lift per wall at locations and elevations as designated by the Engineer.
- H. In addition to the above tests the Independent Testing Laboratory will perform additional density tests at locations and times requested by the Engineer.
- I. Additional density testing will be required by the Engineer if the Engineer is not satisfied with the apparent results of the Contractor's compaction operation.
 - 1. If the test results fail to meet the requirements of these specifications, the Contractor shall undertake whatever action is necessary, at no additional cost to the Owner, to obtain the required compaction. No allowance will be considered for delays in the performance of the work.
 - 2. Reconciliation of re-testing costs are specified in Section 01400.

1.7 JOB CONDITIONS

A. Site Information:

- Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner and Engineer will not be responsible for interpretations or conclusions drawn there from by the Contractor. Data are made available for the convenience of Contractor.
- 2. Additional test borings and other exploratory operations may be made by Contractor at no additional cost to Owner.
- B. Existing Utilities and Structures:
 - 1. The locations of utilities and structures shown on the Drawings are approximate as determined from physical evidence on or above the surface of the ground and from information supplied by the utilities. The Engineer in no way warranties that these locations are correct. It shall be the responsibility of the Contractor to determine the actual locations of any utilities or structures within the project area.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Refer to referenced standards in Parts 1.1 and 1.2.

PART 3 - EXECUTION

3.1 <u>INSPECTION</u>

A. Examine the areas and conditions under which excavating, backfilling, filling, compaction and grading are to be performed and notify the Engineer in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 EXCAVATION

A. General:

- 1. Excavation consists of removal and disposal of all material encountered when establishing line and grade elevations required for execution of the work.
- 2. The Contractor shall make excavations in such manner and to such widths as will give suitable room for building the structures or laying and jointing the piping; shall furnish and place all sheeting, bracing, and supports; shall do all cofferdamming, pumping, and draining; and shall render the bottom of the excavations firm, dry and acceptable in all respects.
- 3. All excavation shall be classified as either earth or ledge.
 - a. Earth Excavation shall consist of the removal, hauling and disposal of all earth materials encountered during excavation including but not limited to native soil or fill, pavement (bituminous or concrete), existing sewers and manholes, ashes, loam, clay, swamp muck, debris, soft or disintegrated rock or hard pan which can be removed with a backhoe, or a combination of such materials, and boulders that do not meet the definition of "Ledge" below.
 - b. Ledge Excavation: Shall consist of the removal, hauling, and disposal of all ledge or rock encountered during excavation. "Ledge" and "rock" shall be defined as any natural compound, natural mixture that in the opinion of the Engineer can be removed from its existing position and state only by drilling and blasting, wedging, sledging, boring or breaking up with power operated tools. No boulder, ledge, slab, or other single piece of excavated material less than two cubic yards in total volume shall be considered to be rock unless, in the opinion of the Engineer it must be removed from its existing position by one of the methods mentioned above.
- 4. The Contractor shall not have any right of property in any materials taken from any excavation. Do not remove any such materials from the construction site without the approval of the Engineer. This provision shall in no way relieve the Contractor of his obligations to remove and dispose of any material determined by the Engineer to be unsuitable for backfilling. The Contractor shall dispose of unsuitable and excess material in accordance with the applicable sections of the Contract Documents.

B. Additional Excavation:

- 1. When excavation has reached required subgrade elevations, notify the Engineer and Resident Project Representative who will observe the conditions.
- 2. If material unsuitable for the structure or paved area or pipeline (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the Drawings and/or Specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted select fill, screened stone, crushed stone, or concrete as directed by the Engineer.
- 3. All excavated materials designated by the Engineer as unsuitable shall become the property of the Contractor and disposed of at locations in accordance with all State and local laws and the provisions of the Contract Documents.

C. Unauthorized Excavation:

- 1. Shall consist of removal of materials beyond indicated subgrade elevations or dimensions without specific authorization of Engineer. Unauthorized excavation, as well as remedial work required by the Engineer shall be at the Contractor's expense. Remedial work required is as follows:
- 2. Under footings, foundation bases, or retaining walls, fill unauthorized excavation with select fill or screened stone compacted to 95%. Provide 12" minimum select fill or screened stone directly under footings. Concrete fill may be used to bring elevations to proper position, when acceptable to Engineer.
- 3. If the bottom of a trench is excavated beyond the limits indicated, backfill the resulting void with thoroughly compacted screened stone, unless otherwise indicated.
- 4. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Engineer.

D. Structural Excavation:

- 1. Shall consist of the removal, hauling, disposal, of all material encountered in the excavation to permit proper installation of structures.
- 2. Excavations for structures shall be carried to the lines and subgrades shown on the Drawings.
- 3. Excavate areas large enough to provide suitable room for building the structures.
- 4. The extent of open excavation shall be controlled by prevailing conditions subject to any limits designated by the Engineer.
- 5. Provide, install, and maintain sheeting and bracing as necessary to support the sides of the excavation and to prevent any movement of earth which could diminish the width of the excavation or otherwise injure the work, adjacent structures, or persons and property in accordance with all state and OSHA safety standards.
- 6. Erect suitable fences around structure excavation and other dangerous locations created by the work, at no additional cost to the Owner.
- 7. Exposed subgrade surfaces shall remain undisturbed, protected, and maintained as uniform, plane areas and shape to receive the foundation components of the structure.

- a. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- b. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade and trim bottoms to required lines and grades to leave solid base to receive the structure.
- c. If a structure is to be constructed within the embankment, the fill shall first be brought to a minimum of 3 feet above the base of the footing. A suitable excavation shall then be made as though the fill were undisturbed earth.

E. Trench Excavation:

- 1. Shall consist of removal, hauling and disposal of all material encountered in the excavation to the widths and depths shown on the Drawings to permit proper installation of underground utilities.
- 2. Excavate trenches to the uniform width shown on the Drawings sufficiently wide to provide sufficient space for installation, backfilling, and compaction. Every effort should be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.
- 3. Trenches shall be excavated with approximately vertical sides between the elevation of the center of the pipe and an elevation one foot above the top of the pipe.
- 4. Grade bottoms of trenches as indicated for pipe and bedding to establish the indicated slopes and invert elevations, notching under pipe joints to provide solid bearing for the entire body of the pipe, where applicable.
- 5. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least two feet above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall be excavated as though in undisturbed material.
- 6. Unless otherwise specifically directed or permitted by the Engineer, begin excavation at the low end of sewer and storm lines and proceed upgrade.
- 7. Perform excavation for force mains and water mains in a logical sequence.
- 8. The extent of open excavation shall be controlled by prevailing conditions subject to any limits prescribed by the Engineer.
- 9. As the excavation progresses, install such shoring and bracing necessary to prevent caving and sliding and to meet the requirements of the state and OSHA safety standards, as outlined in the appropriate section of this Specification.

F. Protection of Persons, Property and Utilities:

- 1. Barricade open excavations occurring as part of this work and post with warning lights in compliance with local and State regulations.
- 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. Exercise extreme caution and utilize sheeting, bracing, and whatever other precautionary measures that may be required.

- 3. Rules and regulations governing the respective utilities shall be observed in execution of all work. Active utilities and structures shall be adequately protected from damage, and removed or relocated only as indicated or specified. Inactive and abandoned utilities encountered in excavation and grading operations shall be removed, plugged or capped only with written authorization of the utility owner. Report in writing to the Engineer, the locations of such abandoned utilities. Extreme care shall be taken when performing work in the vicinity of existing utility lines, utilizing hand excavation in such areas, as far as practicable.
- 4. Repair, or have repaired, all damage to existing utilities, structures, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Engineer, the utility, the property owner, and the Owner.

G. Use of Explosives:

- 1. Do not bring explosives onto site or use in work without prior written permission from authorities having jurisdiction and the Owner. Contractor is solely responsible for handling, storage, and use of explosive materials when their use is permitted.
- 2. All blasting shall be performed in accordance with all pertinent provisions of the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc.

H. Stability of Excavations:

- 1. Slope sides of excavations to comply with all codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
- 2. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

I. Shoring and Bracing:

- 1. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.
- 2. Provide trench shoring and bracing to comply with local codes and authorities having jurisdiction. Refer to Specification Section 02156.
- 3. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Install shoring and bracing as excavation progresses.

J. Material Storage:

- Stockpile excavated materials which are satisfactory for use on the work until required for backfill or fill. Place, grade and shape stockpiles for proper drainage and protect with temporary seeding or other acceptable methods to control erosion.
- 2. Locate and retain soil materials away from edge of excavations.
- 3. Dispose of excess soil material and waste materials as herein specified.

K. Dewatering:

1. To ensure proper conditions at all times during construction, the Contractor shall provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdowns) with which to intercept and/or

- remove promptly and dispose properly of all water entering trenches and other excavations (including surface and subsurface waters).
- 2. Excavations shall be kept dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged. Refer to Specification Section 02140.

L. Cold Weather Protection:

- 1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35*F.
- 2. No frozen material shall be used as backfill or fill and no backfill shall be placed on frozen material.

M. Separation of Surface Material:

- 1. The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the work.
- 2. Prior to excavation, existing pavement shall be cut where in the opinion of the Engineer it is necessary to prevent damage to the remaining road surface.
- 3. Where pavement is removed in large pieces, it shall be disposed of before proceeding with the excavation.
- 4. From areas within which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, he shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated.

N. Dust Control:

- 1. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, so as to minimize the creation and dispersion of dust. Refer to Specification Section 01562.
- 2. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the contractor shall furnish and spread the material, as directed.

3.3 BACKFILL AND FILL

A. General:

- 1. Backfilling shall consist of replacing material removed to permit installation of structures or utilities, as indicated in the Contract Documents.
- 2. Filling shall consist of placing material in areas to bring them up to grades indicated on the Drawings.
- 3. The Contractor shall provide and place all necessary backfill and fill material, in layers to the required grade elevations.
- 4. Backfill excavations as promptly as work permits, but not until completion of the following:
 - a. Acceptance by Engineer of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 - b. Inspection, approval, and recording locations of underground utilities.
 - c. Removal of concrete formwork.
 - d. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Temporary sheet piling driven below bottom of structures shall

- be removed in manner to prevent settlement of the structure or utilities, or cut off and left in place if required.
- e. Removal of trash and debris.
- f. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
- g. Density testing having results meeting requirements specified herein.
- 5. In general, and unless otherwise indicated, material used for backfill of trenches and excavations around structures shall be suitable excavated material which was removed in the course of making the construction excavation. Unless otherwise specified or allowed by the Engineer the backfill and fill shall be placed in layers not to exceed 8 inches in thickness.
- 6. All fill and backfill under structures and pavement, and adjacent to structures, shall be compacted crushed stone or select fill as specified or as indicated on the Drawings. The fill and backfill materials shall be placed in layers not exceeding 8 inches in thickness.
- 7. All structures (including manholes) shall be placed on a 6-inch mat of screened stone unless otherwise indicated.
- 8. Suitable excavated material shall meet the following requirements:
 - a. Free from large clods, silt lumps or balls of clay.
 - b. Free from stones and rock fragments with larger than 12 inch max. dimension.
 - c. Free from organics, peat, etc.
 - d. Free from frozen material.
- 9. If sufficient suitable excavated material is not available from the excavations, and where indicated on the Drawings, the backfill material shall be select fill or common borrow, unless otherwise indicated, as required and as directed by the Engineer.
- 10. Do not backfill with, or on, frozen materials.
- 11. Remove, or otherwise treat as necessary, previously placed material that has frozen prior to placing backfill.
- 12. Do not mechanically or hand compact material that is, in the opinion of the Engineer, too wet.
- 13. Do not continue backfilling until the previously placed and new materials have dried sufficiently to permit proper compaction.
- 14. The nature of the backfill materials will govern the methods best suited for their placement and compaction. Compaction methods and required percent compaction is covered in Compaction section.
- 15. Before compaction, moisten or aerate each layer as necessary to provide a water content necessary to meet the required percentage of maximum dry density for each area classification specified.
- 16. Do not allow large masses of backfill material to be dropped into the excavation in such a manner that may damage pipes and structures.
- 17. Place material in a manner that will prevent stones and lumps from becoming nested.
- 18. Completely fill all voids between stones with fine material.

- 19. Do not place backfill on or against new concrete until it has attained sufficient strength to support loads without distortion, cracking, and other damage.
- 20. Deposit backfill and fill material evenly on all sides of structures to avoid unequal soil pressures.
- 21. Keep stones or rock fragments with a dimension greater than two inches at least one foot away from the pipe or structure during backfilling.
- 22. Leave sheeting in place when damage is likely to result from its withdrawal.
- 23. Completely fill voids left by the removal of sheeting with screened stone which is compacted thoroughly.

B. Pipe Bedding, Initial Backfill and Trench Backfill:

- 1. Place bedding and backfill in layers of uniform thickness specified herein, and as shown on the Drawings.
- 2. Thoroughly compact each layer by means of a suitable vibrator or mechanical tamper.
- 3. Install pipe bedding and initial backfill in layers of uniform thickness not greater than eight (8) inches.
- 4. Deposit the remainder of the backfill in uniform layers not greater than eight inches.
- 5. Provide underground utility marking tape for new utility trenches as shown on the Drawings. Refer to Section 02650 Buried Utility Markings.
- 6. Where soft silt and clay soils are encountered the trench shall be excavated six inches below the normal bedding and backfilled with 6-inches of compacted sand.
- 7. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below the bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of adjacent footings.
- 8. Materials for pipe bedding, initial backfill, and trench backfill shall be in accordance with the applicable Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4 of the *Springfield Water and Sewer Commission Guidelines and Policies Detail Drawings* provided in the Appendix of the Project Manual.
- 9. Where pipes or structures pass through or under the impervious core of the lagoon embankments, bedding and backfill material shall consist of the impervious embankment material. Extra care should be given to properly and thoroughly compact the bedding material around the pipe.
- 10. Special bedding and backfill requirements shown on the drawings supersede requirements of this section.

C. Improper Backfill:

- 1. When excavation and trenches have been improperly backfilled, and when settlement occurs, reopen the excavation to the depth required, as directed by the Engineer.
- 2. Refill and compact the excavation or trench with suitable material and restore the surface to the required grade and condition.
- 3. Excavation, backfilling, and compacting work performed to correct improper backfilling shall be performed at no additional cost to the Owner.

D. Ground Surface Preparation:

- 1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, scarify or break-up sloped surface steeper than 1 vertical to 4 horizontal.
- 2. When existing ground surface has a density less than that specified under "compaction" for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

3.4 COMPACTION

A. General:

1. Control soil compaction during construction to provide not less than the minimum percentage of density specified for each area classification.

B. Percentage of Maximum Density Requirements:

- 1. Compact soil to not less than the following percentages of maximum dry density determined in accordance with ASTM D1557 as indicated.
 - a. Structures: Compact each layer of backfill or fill material below or adjacent to structures to at least 95% of maximum dry density (ASTM D1557).
 - b. Off Traveled Way Areas: Compact each layer of backfill or fill material to at least 90% of maximum dry density (ASTM D1557).
 - c. Walkways: Compact each layer of backfill or fill material to at least 93% of maximum dry density (ASTM D1557).
 - d. Roadways, Drives and Paved Areas: Compact each layer of fill, subbase material, and base material to at least 95% of maximum dry density (ASTM D1557).
 - e. Pipes: Compact bedding material and each layer of backfill to at least 90% maximum dry density (ASTM D1557). Where backfilling with excavated material, compact to native field density.
 - f. Embankments: Compact each layer of embankment material to at least 95% of maximum dry density (ASTM D1557).

C. Moisture Control:

- 1. Where subgrade or a layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, in quantities controlled to prevent free water appearing on surface during or subsequent to compaction operations.
- 2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
- 3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory level.

D. Embankment Compaction:

1. After each embankment layer has been spread to the required maximum 8-inch thickness and its moisture content has been adjusted as necessary, it shall be rolled with a sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips which by means

- of sufficient overlap will ensure complete coverage and uniform compaction of an entire lift. Additional passes shall not be made until the previous pass has been completed.
- 2. When any section of an embankment sinks or weaves excessively under the roller or under hauling units and other equipment, it will be evident that the required degree of compaction is not being obtained and that a reduction in the moisture content is required. If at any place or time such sinking and weaving produces surface cracks which, in the judgment of the Engineer are of such character, amount, or extent to indicate an unfavorable condition, he will recommend operations on that part of the embankment to be suspended until such time as it shall have become sufficiently stabilized. The ideal condition of the embankment is that attained when the entire embankment below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as the roller passes.
- 3. If the moisture content is insufficient to obtain the required compaction, the rolling shall not proceed except with the written approval of the Engineer, and in that event, additional rolling shall be done to obtain the required compaction. If the moisture content is greater than the limit specified, the material of such water content may be removed and stockpiled for later use or the rolling shall be delayed until such time as the material has dried sufficiently so that the moisture content is within the specified limits. No adjustment in price will be made on account of any operation of the Contractor in removing and stockpiling, or in drying the materials or on account of delays occasioned thereby.
- 4. If because of insufficient overlap, too much or too little water, or other cause attributable to defective work, the compaction obtained over any area is less than that required, the condition shall be remedied, and if additional rollings are ordered, they will be done at no cost to the Owner. If the material itself is unsatisfactory or if additional rolling or other means fails to produce satisfactory results, the area in question shall be removed down to material of satisfactory density and the removal, replacement, and re-rolling shall be done by the Contractor, without additional compensation.
- 5. Material compaction by hand—operated equipment or power-driven tampers shall be spread in layers not more than 6 inches thick. The degree of compaction obtained by these tamping operations shall be equal in every respect to that secured by the rolling operation.
- E. Compaction Methods: The Contractor may select any method of compaction that is suitable to compact the material to the required density.
 - 1. General: Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. All voids left by the removal of sheeting shall be completely backfilled with suitable materials and thoroughly compacted.
 - 2. Tamping or Rolling: If the material is to be compacted by tamping or rolling, the material shall be deposited and spread in uniform, parallel layers not exceeding the uncompacted thicknesses specified. Before the next layer is

placed, each layer shall be tamped as required so as to obtain a thoroughly compacted mass. Care shall be taken that the material close to the excavation side slopes, as well as in all other portions of the fill area, is thoroughly compacted. When the excavation width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe or structure, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar powered equipment instead of by tamping. For compaction by tamping or rolling, the rate at which backfilling material is deposited shall not exceed that permitted by the facilities for its spreading, leveling, and compacting as furnished by the Contractor.

F. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.5 GRADING:

A. General:

- 1. Grading shall consist of that work necessary to bring all areas to the final grades.
- 2. Uniformly grade areas within limits of work requiring grading, including adjacent transition areas.
- 3. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Grading Outside Building Lines:

- 1. Grade areas adjacent to building to drain away from structures and to prevent ponding.
- 2. Grade surfaces to be free from irregular surface changes, and as follows:
 - a. Lawn or Unpaved Areas: Finish grade areas to receive topsoil to within not more than 1" above or below the required subgrade elevations.
 - b. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 1/2" above or below the required subgrade elevation.
 - c. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 3/8" above or below the required subgrade elevation.

C. Grading Surface of Fill Under Building Slabs:

- 1. Grade surface to be smooth and even, free of voids, and compacted as specified, to the required elevation.
- 2. Provide final grades within a tolerance of 1/2" when tested with a 10' straight edge.

D. Compaction:

1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

E. Protection of Graded Areas:

- 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- 2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

3.6 BASE COURSE AND LEVELING COURSE

A. General:

1. Base course consists of placing the specified materials in layers to support a leveling course or paved surface, as indicated in the Drawings.

B. Grade Control:

1. During construction, maintain lines and grades including crown and cross-slope of base course and leveling course.

C. Placing:

- 1. Place base course on prepared subbase conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting base materials.
- 2. Place leveling course on prepared base course, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compaction.

D. Shaping and Compacting:

- 1. All layers of aggregate base course and leveling course shall be compacted to the required density immediately after placing. As soon as the compaction of any layer has been completed, the next layer shall be placed.
- 2. The Contractor shall bear full responsibility for and make all necessary repairs to the base leveling courses and the subgrade until the full depth of the base leveling courses is placed and compacted. Repairs shall be made at no additional cost to the Owner.
- 3. If the top of any layer of the aggregate base or leveling course becomes contaminated by degradation of the aggregate or addition of foreign materials, the contaminated material shall be removed and replaced with the specified material at the Contractor's expense.

FLOWABLE FILL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Provide and install flowable fill material in authorized excavation(s) as shown on the Drawings and/or as specified herein.
- B. Refer to the following specifications for water main and appurtenance requirements, as provided as an Appendix to this Project Manual. The content of this section supplements these requirements.
 - Springfield Water and Sewer Commission Guidelines and Policies Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020
 - Springfield Water and Sewer Commission Material Specifications Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020
 - 3. Springfield Water and Sewer Commission –Standard Details Liberty Street and Westford Circle Water Main Replacement Project *Version 4 –August 12*, 2021
 - 4. City of Springfield Manual for Occupancy of Public and Private Ways within the City of Springfield *June 5*, 2017
- C. Related Work Specified Elsewhere:
 - 1. Earthwork, excavation, backfilling, compaction, piping, manholes, testing and pavement are specified in the appropriate sections of this Division.

1.2 QUALITY ASSURANCE

A. Perform work in accordance with ACI 229, Controlled Low-Strength Materials, or as specified here-in.

1.3 **SUBMITTALS**

A. Submit Mix designs for each mixture to be provided at least 15 days prior to production.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Refer to referenced requirements in Part 1.1.

PART 3 - EXECUTION

3.1 **EXAMINATION**

- A. Flowable fill shall be produced and delivered using standard concrete construction equipment and practices.
- B. Placing flowable fill shall be by chute, pumping, or other method approved by the Engineer.

- C. The flowable fill shall be discharged directly from the mixer truck into the space to be filled.
- D. No flowable fill shall be placed on frozen ground.
- E. At the time of placement the flowable fill shall have a temperature of at least 40 degrees F.
- F. When flowable fill is placed in freezing temperatures, the material should be covered with blankets and protected from freezing until hardening.
- G. The Contractor shall provide all necessary means to confine the material within a designated space.
- H. Formed walls or other bulkheads shall be constructed to withstand hydrostatic pressure exerted by flowable fill where necessary and as determined by the Engineer.
- I. The Contractor is responsible to ensure underground utilities, including but not limited to pipes, tanks, structures, cables, etc. are secured to prevent floating.
- J. No compaction or vibration of the material is required.
- K. Where flowable fill is being used as pipe bedding it shall be placed in lifts to ensure lateral support of the pipe develops along the side of the pipe before continuing with the backfilling.
- L. When paving over flowable fill in cold weather, any frozen material on the surface shall be scraped off and removed prior to paving.
- M. The flowable fill shall be left undisturbed until the material obtains sufficient strength. Sufficient strength for paving is achieved when the flowable fill can support the weight of foot traffic without apparent deformation. Sufficient strength for supporting vehicular traffic is 2.5 tons per square foot as measured by a pocket penetrometer.
- N. Trenches shall be covered and barricaded until hardening occurs.

FILTER FABRIC

PART 1 - GENERAL

1.1 <u>DESCRIPTION</u>

- A. Work Included:
 - 1. Furnish all materials and install filter fabric of the types, dimensions and in the location(s) shown on the Drawings and specified herein.
- B. Related Work Specified Elsewhere
 - 1. Temporary Erosion Control, Riprap and Stone Ditch Protection, and Gabions and Revet Mattresses are specified in the appropriate sections of this Division.

1.2 QUALITY ASSURANCE

- A. A competent laboratory must be maintained by the manufacturer of the fabric at the point of manufacture to ensure quality control.
- B. During all periods of shipment and storage, the fabric shall be wrapped in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays, temperatures greater than 140oF, mud, dirt, dust and debris.

1.3 SUBMITTALS

A. Manufacturer shall furnish certified test reports with each shipment of material attesting that the fabric meets the requirements of this Specification

PART 2 - PRODUCTS

2.1 MATERIALS

A. Filter fabric for use in stabilization, drainage, underdrains, landscaping and beneath structures shall be formed in widths of not less than six (6) feet and shall meet the requirements of Table 1. Both woven and non-woven geotextiles are acceptable; however no "slit-tape" woven fabrics will be permitted for drainage, underdrain, and erosion control applications.

	TABLE 1	
Geotextile		Minimum
Mechanical Property	Test Method	Permissible Value
Grab Tensile Strength (both directions)	ASTM D4595-86	120 pounds
Grab Elongation	ASTM D4632-86	50 percent
Mullen Burst Strength	ASTM D3786-87	210 psi
Puncture Strength	ASTM D3787	60 pounds
Trapezoid Tear Strength	ASTM D4533-85	50 pounds
Water Flow Rate	ASTM D4491-85	120 gal/min/sf
Equivalent Opening Size (EOS)	ASTM D4751	U.S. Std. Sieve #80
Coefficient of Permeability	ASTM D4491-85	0.2 cm/sec

- The geotextile shall have property values expressed in "typical" values that meet or exceed the values stated above as determined by the most recent test methods specified above.
- B. Filter fabric for use in reinforcement shall meet the requirements of Table 2. Woven and non-woven geotextiles are acceptable.

	TABLE 2	
Geotextile		Minimum
Mechanical Property	Test Method	Permissible Value
Grab Tensile Strength (both directions)	ASTM 4595-86	195 pounds
Grab Elongation	ASTM D4632-86	20 percent
Mullen Burst Strength	ASTM D3786-87	340 psi
Puncture Strength	ASTM D3787	85 pounds
Trapezoid Tear Strength	ASTM D4533-85	85 pounds
Equivalent Opening Size (EOS)	ASTM D4751	U.S. Std. Sieve
		number(s)
		between #20
		and #100

The geotextile shall meet or exceed the "typical" values stated above as determined by the most recent test methods specified above.

- C. Filter Fabric for use under riprap shall meet the requirements as specified in Section 02271 Riprap and Stone Ditch Protection.
- D. For Silt Fence, refer to Section 02270 Temporary Erosion Control Execution

PART 3 - EXECUTION

3.1 Install filter fabric as shown on the drawings or as directed in appropriate specifications in this division or in accordance with manufacturer's instructions or as directed by the engineer.

LOAMING & SEEDING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish, place, and test topsoil, seed, lime, and fertilizer where shown on the drawings and protect and maintain seeded areas disturbed by construction work, as directed by the Engineer.
- B. Related Work Specified Elsewhere (When Applicable): Earthwork, excavation, backfill, compaction, site grading and temporary erosion control are specified in the appropriate Sections of this Division.

1.2 SUBMITTALS AND TESTING

A. Seed:

- 1. Furnish the Engineer with duplicate signed copies of a statement from the vendor, certifying that each container of seed delivered to the project site is fully labeled in accordance with the Federal Seed Act and is at least equal to the specification requirements.
- 2. This certification shall appear in, or with, all copies of invoices for the seed.
- 3. The certification shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates and certificates have been approved.
- 4. Each lot of seed shall be subject to sampling and testing, at the discretion of the Engineer, in accordance with the latest rules and regulations under the Federal Seed Act.

B. Topsoil:

- 1. Inform the Engineer, within 30 days after the award of the Contract, of the sources from which the topsoil is to be furnished.
- 2. Obtain representative soil samples, taken from several locations in the area under consideration for topsoil removal, to the full stripping depth.
- 3. Have soil samples tested by an independent soils testing laboratory, approved by the Engineer, at the Contractor's expense.
- 4. Have soil samples tested for physical properties and pH (or lime requirement), for organic matter, available phosphoric acid, and available potash, in accordance with standard practices of soil testing.
- 5. Approval, by the Engineer, to use topsoil for the work will be dependent upon the results of the soils tests.

C. Lime & Fertilizer:

1. Furnish the Engineer with duplicate copies of invoices for all lime and fertilizer used on the project showing the total minimum carbonates and minimum percentages of the material furnished that pass the 90 and 20 mesh sieves and the grade furnished.

- 2. Each lot of lime and fertilizer shall be subject to sampling and testing at the discretion of the Engineer.
- 3. Sampling and testing shall be in accordance with the official methods of the Association of Official Agricultural Chemists.
- 4. Upon completion of the project, a final check may be made comparing the total quantities of fertilizer and lime used to the total area seeded. If the minimum rates of application have not been met, the Engineer may require the Contractor to distribute additional quantities of these materials to meet the minimum rates.

1.3 <u>DELIVERY, STORAGE & HANDLING</u>

A. Seed:

- 1. Furnish all seed in sealed standard containers, unless exception is granted in writing by the Engineer.
- 2. Containers shall be labeled in accordance with the United States Department of Agriculture's rules and regulations under the Federal Seed Act in effect at the time of purchase.

B. Fertilizer:

- 1. Furnish all fertilizer in unopened original containers.
- 2. Containers shall be labeled with the manufacturer's statement of analysis.

1.4 JOB CONDITIONS

A. Topsoil: Do not place or spread topsoil when the subgrade is frozen, excessively wet or dry, or in any condition otherwise detrimental, in the opinion of the Engineer, to the proposed planting or to proper grading.

B. Seeding:

- 1. Planting Seasons: The recommended seeding time is from April 1 to September 15. The Contractor may seed at other times. Regardless of the time of seeding, the Contractor shall be responsible for each seeded area until it is accepted.
- 2. Weather Conditions:
 - a. Do not perform seeding work when weather conditions are such that beneficial results are not likely to be obtained, such as drought, excessive moisture, or high winds.
 - b. Stop the seeding work when, in the opinion of the Engineer, weather conditions are not favorable.
 - c. Resume the work only when, in the opinion of the Engineer, conditions become favorable, or when approved alternate or corrective measures and procedures are placed into effect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seed:

- 1. Provide the grass seed mixture approved by the Engineer, having the following composition:
 - a. Park Mixture:
 - 50 percent Creeping Red Fesque
 - 30 percent Kentucky Bluegrass

- 20 percent Annual Ryegrass
- b. Roadside Mixture:
 - 50 percent Creeping Red Fescue
 - 15 percent Kentucky Bluegrass
 - 5 percent White Clover
 - 2 percent Red Top
 - 3 percent Birdsfoot Trefoil
 - 25 percent Annual Ryegrass
- 2. Do not use seed which has become wet, moldy, or otherwise damaged in transit or during storage.

B. Topsoil:

- 1. Fertile, friable, natural topsoil typical of the locality, without admixture of subsoil, refuse or other foreign materials and obtained from a well-drained site. Mixture of sand, silt, and clay particles in equal proportions.
- 2. Free of stumps, roots, heavy of stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, weeds, sticks, brush or other deleterious matter.
- 3. Not less than 4 percent nor more than 20 percent organic matter.
- 4. Topsoil depth shall be 4-inches, unless otherwise indicated.

C. Lime:

- 1. Provide lime which is ground limestone containing not less than 85% of total carbonate and of such fineness that 90% will pass a No. 20 sieve and 50% will pass a No. 100 sieve.
- 2. Coarser materials will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing a No. 100 sieve. No additional payment will be made to the Contractor for the increased quantity.

D. Fertilizer:

- 1. Provide a commercial fertilizer approved by the Engineer.
- 2. Provide fertilizer containing the following minimum percentage of nutrients by weight:

10% Available phosphoric acid

10% Available potash

10% Available nitrogen (75% of the nitrogen shall be organic)

PART 3 - EXECUTION

3.1 PREPARATION

A. Equipment:

- 1. Provide all equipment necessary for the proper preparation of the ground surface and for the handling and placing of all required materials.
- 2. Demonstrate to the Engineer that the equipment will apply materials at the specified rates.
- B. Soil: Perform the following work prior to the application of lime, fertilizer or seed.
 - 1. Scarify the subgrade to a depth of 2 inches to allow the bonding of the topsoil with the subsoil.
 - 2. Apply topsoil to a depth of 4 inches or as directed on areas to be seeded.

- 3. Trim and rake the topsoil to true grades free from unsightly variations, humps, ridges or depressions.
- 4. Remove all objectionable material and form a finely pulverized seed bed.

3.2 <u>PERFORMANCE</u>

A. Grading:

- 1. Grade the areas to be seeded as shown on the Drawings or as directed by the Engineer.
- 2. Leave all surfaces in even and properly compacted condition.
- 3. Maintain grades on the areas to be seeded in true and even conditions, including any necessary repairs to previously graded areas.

B. Placing Topsoil:

- 1. Uniformly distribute and evenly spread topsoil on the designated areas.
- 2. Spread the topsoil in such a manner that planting work can be performed with little additional soil preparation or tillage.
- 3. Correct any irregularities in the surface resulting from topsoiling or other operations to prevent the formation of depressions where water may stand.
- 4. Thoroughly till the topsoil to a depth of at least 3 inches by plowing, harrowing, or other approved method until the condition of the soil is acceptable to the Engineer. The surface shall be cleared of all debris and or stones one inch or more in diameter.

C. Placing Fertilizer:

- 1. Distribute fertilizer uniformly at a rate determined by the soils test over the areas to be seeded.
- 2. Incorporate fertilizer into the soil to a depth of at least 3 inches by discing, harrowing, or other methods acceptable to the Engineer.
- 3. The incorporation of fertilizer may be a part of the tillage operation specified above.
- 4. Distribution by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time will be acceptable.

D. Placing Lime:

- 1. Uniformly distribute lime immediately following or simultaneously with the incorporation of fertilizer.
- 2. Distribute lime at a rate determined from the pH test, to a depth of at least 3 inches by discing, harrowing, or other methods acceptable to the Engineer.

E. Seeding:

1. Fine rake and level out any undulations or irregularities in the surface resulting from tillage, fertilizing, liming or other operations before starting seeding operations.

2. Hydroseeding:

- a. Hydroseeding may be performed where approved and with equipment approved by the Engineer.
- b. Sow the seed over designated areas at a minimum rate of 5 pounds per 1000 square feet.
- c. Seed and fertilizing materials shall be kept thoroughly agitated in order to maintain a uniform suspension within the tank of the hydroseeder.

d. The spraying equipment must be designed and operated to distribute seed and fertilizing materials evenly and uniformly on the designated areas at the required rates.

3. Drill Seeding:

- a. Drill seeding may be performed with approved equipment having drills not more than 2 inches apart.
- b. Sow the seed uniformly over the designated areas to a depth of 1/2 inch and at a rate of 5 pounds per 1,000 square feet.

4. Broadcast Seeding:

- a. Broadcast seeding may be performed by equipment approved by the Engineer.
- b. Sow the seed uniformly over the designated areas at a rate of 5 pounds per 1,000 square feet.
- c. Sow half the seed with the equipment moving in one direction and the remainder of the seed with the equipment moving at right angles to the first sowing.
- d. Cover the seed to an average depth of 1/2 inch by means of a brush harrow, spike-tooth harrow, chain harrow, cultipacker, or other approved devices.
- e. Do not perform broadcast seeding work during windy weather.

F. Compacting:

- 1. Seeded areas must be raked lightly after sowing unless seeding is to be directly followed by application of an approved mulch.
- 2. Compact the entire area immediately after the seeding operations have been completed.
- 3. Compact by means of a cultipacker, roller, or other equipment approved by the Engineer weighing 60 to 90 pounds per linear foot of roller.
- 4. If the soil is of such type that a smooth or corrugated roller cannot be operated satisfactorily, use a pneumatic roller (not wobbly wheel) that has tires of sufficient size to obtain complete coverage of the soil.
- 5. When using a cultipacker or similar equipment, perform the final rolling at right angles to the prevailing slopes to prevent water erosion, or at right angles to the prevailing wind to prevent dust.

3.3 PROTECTION & MAINTENANCE

A. Protection:

- 1. Protect the seeded area against traffic or other use.
- 2. Erect barricades and place warning signs as needed.

B. Maintenance:

- At the time of the first cutting, set mower blades two inches high. All lawns shall receive at least two mowing's before acceptance. Coordinate schedule for mowing with Engineer.
- 2. Maintenance shall also include all temporary protection fences, barriers and signs and all other work incidental to proper maintenance.
- 3. Maintain grass areas until a full stand of grass is indicated, which will be a minimum of 45 days after all seeding work is completed, and shall not necessarily related to Substantial Completion of the General Contract.

4. Protection and maintenance of grass areas shall consist of watering, weeding, cutting, repair of any erosion and reseeding as necessary to establish a uniform stand for the specified grasses, and shall continue until Acceptance by the Engineer of the work of this section. It shall also include the furnishing and applying of such pesticides as are necessary to keep grass areas free of insects and disease. All pesticides shall be approved by Engineer prior to use.

3.4 <u>ACCEPTANCE</u>

A. At final acceptance of the project all areas shall have a close stand of grass with no weeds present and no bare spots greater than three inches (3") in diameter over greater than five percent (5%) of the overall seeded area.

CEMENT CONCRETE SIDEWALKS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: This work shall consist of the construction of new cement concrete sidewalks and driveways in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the Drawings or established by the Engineer.
- B. Related Work Specified Elsewhere: (When Applicable) Earthwork, aggregate base and subbase, bituminous concrete paving and granite curbs are specified in the appropriate sections in this Division.

1.2 <u>RELATED DOCUMENTS</u>

- A. Springfield Department of Public Works Standard Engineering Details.
- B. Accessible routes, parking spaces, ramps (including water bypass ramps), sidewalks, and walkways shall be constructed in conformance with the federal Americans with Disabilities Act (ADA); and state and local laws and regulations (whichever are more stringent).

1.3 QUALITY ASSURANCE

- A. Materials: Use only materials furnished by a bulk cement concrete producer regularly engaged in the production of portland cement concrete.
- B. Submittals: A certificate of compliance shall be furnished to the Engineer that the materials supplied comply with the specification requirements.

1.4 SUBMITTALS

A. Refer to Division 3 for required material submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The portland cement concrete shall conform to the requirements of AASHTO M85 Type II with a moderate heat of hydration and with the following exceptions:
 - 1. The autoclave expansion shall be limited to a maximum of 0.20 percent.
 - 2. There will be no requirements for tensile strength.
 - 3. Only one brand of cement shall be used on any one contract unless otherwise permitted, in writing, be the Engineer.
- B. The welded wire fabric for reinforcement shall conform to the requirements of AASHTO M 55/M 55, unless otherwise specified.
- C. The premolded expansion joint material shall be non-extruding and resilient bituminous type and shall conform to the requirements of AASHTO M213.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavation shall be to the depth and width that will permit the installation and bracing of the forms. The foundation shall be shaped and compacted to a firm even surface conforming to the section shown on the plan. All soft and yielding material shall be removed and replaced with acceptable material.

3.2 FORMS

A. Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be true, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.

3.3 PLACING CONCRETE

A. The foundation shall be thoroughly moistened immediately prior to placing the concrete. The proportioning, mixing and placing of the concrete shall be in accordance with good construction practices, as stated in the requirements of the MDOT specifications Section 502 - Structural Concrete.

3.4 FINISHING

- A. The surface shall be finished to produce a broom like pattern.
- B. No plastering of the surface with mortar will be permitted.

3.5 JOINTS

- A. Joints shall be located as shown on the plans. Slabs shall be placed alternately and the joints coated with an approved bituminous material before placing the adjacent slab.
- B. When a concrete sidewalk is constructed adjacent to a curb, building, retaining wall, light pole base or other fixed structure, a 1/4 inch thick premolded joint filler shall be used between the slab and the structure.

3.6 CURING

A. Concrete shall be cured for at least 72 hours. Curing shall be by moist burlap or mats, white pigmented curing compound or by other approved methods. During the curing period, all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as may be directed.

BITUMINOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included:
 - 1. Furnish all plant, labor, equipment and materials required to install bituminous concrete pavement courses, including sidewalks, driveways, temporary and permanent trench paving and restoration of pavement markings as shown on the Drawings and as specified herein.
 - 2. Remove bituminous asphaltic and/or Portland cement pavement, and replace bituminous asphaltic pavement, base, binder courses and surface courses, including temporary pavement, within the area(s) shown on the Drawings and as directed by the Engineer.
 - 3. Keep pavement removal to a minimum width suitable for the required construction.
 - 4. Apply pavement markings to the permanent paving as specified.
- B. Work Not Included: Removal and replacement of paving for the convenience of the Contractor will not be considered for payment.
- C. Related Work Specified Elsewhere (When Applicable):
 - 1. Excavation, backfill, aggregate base and subbase.

1.2 REFERENCE STANDARDS

- A. Springfield Department of Public Works Standard Engineering Details.
- B. Massachusetts Department of Transportation "Standard Specifications for Highways and Bridges", dated 1988.
- C. Massachusetts Department of Transportation "Supplemental Specifications to the 1988 English Standard Specifications for Highways and Bridges", dated April 1, 2019. These supplemental specifications and 1988 Standard Specifications for Highways and Bridges will be jointly referred to as the Mass DOT Standard Specifications.
- D. Massachusetts DEP Policy Memorandum No. CG-8: Pavement. See the Appendices.
- E. Accessible routes, parking spaces, ramps (including water bypass ramps), sidewalks, and walkways shall be constructed in conformance with the federal Americans with Disabilities Act (ADA); and state and local laws and regulations (whichever are more stringent).

1.3 OUALITY ASSURANCE

- A. Materials: Use only materials furnished by a bulk bituminous concrete producer regularly engaged in the production of hot mixed, hot laid bituminous concrete.
- B. Equipment: Provide, maintain and operate pavers, dump trucks, tandem, 3-wheel and pneumatic tired rollers well suited to the mixtures being placed. Provide, maintain and operate hand equipment as required. When applicable, provide, maintain and operate trimming equipment and materials.

C. Mix Requirements, Method of Placement and Compaction: The Commonwealth of Massachusetts, Department of Transportation Standard Specifications - Highways and Bridges, 1973 hereinafter called Massachusetts DOT Standards, for mixing, placing and compacting bituminous concrete surfaces are applicable to this work.

1.4 SUBMITTALS

- A. A certificate of compliance shall be furnished to the Engineer that the materials supplied comply with the specification requirements.
- B. Delivery slips shall be furnished with each load of mix delivered to the project. Information shall include:
 - 1. Vehicle identification.
 - 2. Date.
 - 3. Project.
 - 4. Identification of material.
 - 5. Gross, tare and net weights.
 - 6. Signed by the bituminous concrete producer.
 - 7. Stamped by a licensed public weighmaster.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bituminous concrete pavement (hot mix asphalt) shall conform to Mass DOT Standard Specifications.
- B. The following products shall conform to the MASS DOT Standard Specifications:
 - 1. Mineral Fillers
 - 2. Tack Coats
 - 3. Thermoplastic Reflectorized Pavement Markings

PART 3 - EXECUTION

3.1 GENERAL

- A. Furnishing and installation of Bituminous concrete pavement (hot mix asphalt) shall conform to the Mass DOT Standard Specifications.
- B. Grade Control:
 - 1. The Contractor shall establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations.
- C. Trench areas shall receive initial paving as the work progresses where trenches are in paved streets. Not more than 300 linear feet of backfill trench shall be left unpaved.
- D. Reset all existing manholes to finished grade as required at no additional cost to the Owner.

3.2 PAVEMENT REMOVAL

A. General:

1. Exercise extreme care in the removal of pavement so that pavement will not be unnecessarily disturbed or destroyed.

2. Mechanically cut pavement to be removed to a straight line, unless otherwise directed by the Engineer.

3.3 SURFACE PREPARATION

- A. Tack coats shall conform to the Mass. D.O.T. Standard Specifications.
- B. Tack Coat:
 - 1. Apply to contact surfaces of previously constructed asphalt or portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Distribute at rate of 0.05 to 0.15 gallons per square yard of surface.

3.4 PLACING THE MIX

A. General:

1. Place asphalt concrete mixture on prepared surface. Minimum allowable temperature for placing is 250°F. Maximum shall be 325°F. Place in areas inaccessible to paving machine and small areas by hand. Place each course to required grade, cross-slope and compacted thickness.

B. Protection:

1. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened to the extent that the pavement will not be damaged.

3.5 TEMPORARY PAVING

- A. Install the equivalent full thickness of the required permanent pavement restoration.
- B. Temporary paving is to remain in place for a 90-day consolidation period before proceeding with permanent paving.
- C. Refer to Supplemental Details of the Contract Drawings for additional information.
- D. Temporary paving shall be installed for every 300-feet of water main installed or by the end of day every Friday.

3.6 PERMANENT PAVING

A. Refer to the 'Springfield DPW standard Engineering Details – Detail ID #0054A and Detail ID #0055A' in the Appendix of the Project Manual.

3.7 PAVEMENT MARKINGS

- A. Material, approved by the Engineer, is to be furnished and applied after the installation of permanent paving.
- B. Apply pavement markings in accordance with existing markings. Match paint color, marking dimensions, layout and other details with existing markings in the vicinity of the project.

GRANITE CURBS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: This work shall consist of furnishing and installing curb or edging, or removing and relaying existing curbing or edging in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the Drawings or established by the Engineer. The types of curbs are designated as follows:
 - Type 1 Vertical granite curb
 - Type 5 Sloped granite edging
- B. Related Work Specified Elsewhere: Excavation and Embankment, Aggregate Base and Subbase, Bituminous Concrete Paving and Landscaping are specified in the appropriate Sections of this Division.

1.2 REFERENCE STANDARDS

A. Springfield Department of Public Works – Standard Engineering Details.

1.3 SUBMITTALS

- A. Submit shop drawings in accordance with the applicable sections of Division 1, and the General Conditions of the Specifications.
- B. Provide dimensional information, layout diagrams, and source of materials.
- C. Submit mortar mix design.
- D. Submit masonry contractor's qualifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General:
 - 1. The stone for curbing and edging shall be hard, durable, quarried granite.
 - 2. It shall be gray in color, free from seams, cracks or other structural defects and shall be of smooth splitting character.
 - 3. The curb may contain natural color variations that are characteristic of the granite source.
 - 4. The dimensions, shape and other details shall be as shown on the Drawings.

B. Source:

- 1. The Contractor shall submit for approval the name of the quarry which is the proposed source of the granite for curb materials.
- 2. Samples shall be submitted for acceptance by the Engineer when requested.
- C. Finish and Surface Dimensions:
 - 1. Vertical Curb, Type 1:
 - a. The individual curb stones shall conform to the dimensions indicated on the Drawings.

- b. Individual stones shall be furnished in minimum lengths of 6 feet, unless otherwise specified.
- c. The exposed face of the stone curb shall be free from indications of drill holes. Half drill holes not larger than 3/4 inches diameter will be permitted in the arris line in the plane of the back.
- d. The top surface shall be sawed or dressed to an approximately true plane with no depression or projection on that surface of over 1/8 inch.
- e. The top front arris line shall be pitched straight and true with no variations from a straight line greater than 1/4 inch.
- f. The top back arris line shall meet the same requirement as the top front arris except that indentations of a maximum of 3/8 inch will be allowed.
- g. There shall be no projection or depression on the back face which would exceed a batter of 1 horizontal on 3 vertical for a distance from the top of 3 inches.
- h. The front face shall be at right angles to the top and shall be smooth split and have no projections greater than one inch or depressions greater than 1/2 inches, measured from the vertical plane of the face through the top arris line, for a distance down from the top of 8 inches. The remainder of the face shall have no projections or depressions greater than one inch measured in the same manner.
- i. The ends of the curb shall be approximately square with the planes of the top, back and face and so finished that when the sections are placed end to end with the required minimum spacing of 1/4 inch no more than 5/8 inch space shall show in the joint for the full width of the top surface and for the entire exposed front face. The remainder of the end may extend back no more than 8 inches from the plane of the joint.
- j. The bottom surface may be sawn or split.
- k. Drill holes through the curb will be allowed providing they are at least 9 inches below the top and are mortared full with portland cement mortar before placing the stone.
- 2. When curbing is specified on the Drawings with a radius of 60 feet or less, it shall be cut on the specified radius.
- 3. Curb Inlets: Inlets used at catch basins shall conform to the applicable requirements of Vertical Curb, Type 1, and to the shape, dimensions and details as shown on the Drawings.
- 4. Sloped Edging, Type 5:
 - a. The individual edging stones shall conform to the dimensions indicated on the Drawings.
 - b. Individual stones shall be furnished in minimum lengths of two (2) feet, unless otherwise specified.
 - c. The exposed face shall be smooth split to an approximate true plane having no projections or depressions which will allow over one (1) inch to show between a two (2) foot straightedge and the face when the straightedge is placed as closely as possible on any part of the face.
 - d. Half drill holes not more than three (3) inches in length and 3/4 inch in diameter will be permitted along the bottom.

- e. The arris line, top front shall be straight and true with no variation from a straight line greater than 1/8 inch.
- f. The arris lines at the bottom of the face shall be straight and true so that not over one (1) inch shall show between the stone and a straightedge for the full length of the stone.
- g. The ends shall be square to the length at the face and so finished that when the stones are placed end to end, no space more than 1 1/2 inches will show in the joint for the width of the face.
- h. When sloped edging is specified on the Drawings with a radius of thirty (30) feet or less, it shall be cut on the specified radius.
- 5. Terminal curb, Type 1: Shall meet the requirements of Vertical Curb, Type 1 as contained herein.

D. Joint Mortar:

- 1. Shall consist of one (1) part portland cement and two (2) parts sand and mixed with sufficient water to form a plastic composition.
- 2. The portland cement shall conform to AASHTO M85, Type II-A.
- 3. The sand shall consist of the following gradation:

100% Passing the No. 8 sieve
15-40% Passing the No. 50 sieve
0-10% Passing the No. 100 sieve
0-5% Passing the No. 200 sieve

PART 3 - EXECUTION

3.1 <u>REMOVAL OF CURBING</u>

- A. The Contractor shall carefully remove, store and clean curb specified on the Drawings or designated for resetting.
- B. Curbing damaged or destroyed, as a result of the Contractor's operations or because of his failure to store and protect it in a manner that would prevent loss or damage, shall be replaced with curbing of equal quality at the Contractor's expense.

3.2 EXCAVATION

- A. Excavation shall be made to the required depth and base material upon which the curb is to be set shall be compacted to a firm, even surface.
- B. All soft and unsuitable material shall be removed and replaced with suitable material which shall be thoroughly compacted.

3.3 <u>INSTALLATION</u>

- A. The curb and sloped edging shall be set so that the front top arris line is in close conformity to the line and grade required.
- B. All space beneath the curbing shall be filled and thoroughly tamped with material meeting the requirements of the bed course material.

3.4 JOINTS

- A. The required spacing between stones shall be a minimum of 1/4 inch and a maximum of 5/8 inch for Type 1 curb.
- B. The required spacing between stones shall be a maximum of 1/2 inch for Type 5 curb.

C. Joints between stones shall be carefully filled with mortar along the back portion of the joint to prevent loss of backfill material.

3.5 BACKFILLING

A. After the joints have set, any remaining excavated areas shall be filled and tamped with approved material placed in eight (8) inch layers.

3.6 <u>CURB INLETS</u>

A. Curb placed adjacent to curb inlets shall be installed with steel dowels cemented into each stone with epoxy grout.

TEMPORARY WATER MAIN

PART 1 - GENERAL

1.1 SUMMARY

- A. Refer to the following specifications for water main and appurtenance requirements, as provided as an Appendix to this Project Manual. The content of this section supplements these requirements.
 - Springfield Water and Sewer Commission Guidelines and Policies Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020
 - Springfield Water and Sewer Commission Material Specifications Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020
 - 3. Springfield Water and Sewer Commission –Standard Details Liberty Street and Westford Circle Water Main Replacement Project *Version 4 –August 12*, 2021
 - 4. City of Springfield Manual for Occupancy of Public and Private Ways within the City of Springfield *June 5*, 2017

1.2 SCOPE OF WORK

- A. 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.
- B. The Contractor shall provide temporary water service to all water customers currently connected to mains to be shut off in order to facilitate the work, by means of temporary hose connections.
- C. The Contractor shall furnish all work and fittings and make all necessary connections required to supply the bypass pipes (including service, supply lines and fire protection hydrants) with water from existing 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.
- D. The work of relocating existing service and of furnishing and installing temporary water pipe, temporary customer services and other branches, maintaining the same, providing suitable safety precautions and removal of the temporary water pipe system shall be the sole responsibility and expense of the Contractor.
- E. No temporary water bypass piping shall be in service between November 15th and April 15th without approval from SWSC.
- F. Contractor shall coordinate all shutdowns and temporary connections with SWSC.

1.3 SUBMITTALS

A. Shop drawings shall be submitted to the Engineer for review in accordance with Section 01300.

B. The Contractor shall submit to the Engineer for approval, a detailed work plan for the installation of temporary water bypass system. The detailed work plan shall include at a minimum the location of all valving and piping; the proposed sequence and schedule of installation; and the proposed sequence and schedule for disinfection and testing.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Temporary water mains, valves, fittings, water service hose, and hose fittings shall be in accordance with Section 6.1 of SWSC Material Specifications.
- B. 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.
- C. Temporary water mains, valves, water service hose, and hose fittings shall be suitable for potable water, and certified to NSF 61 standards.
- D. 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.
- E. All materials shall be rated for 250 PSI.
- F. 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:
 - 1. PVC shall be 1120 defined as type 1, grade1, class 12454-B
 - 2. Tensile strength: 7,000-PSI minimum
 - 3. Modulus of Elasticity: 400,000-PSI minimum
 - 4. Impact Strength (Izod): 0.65-ft-lbs per 1-inch of notch
 - 5. Deflection Temperature: 158-degrees F minimum
 - 6. Flammability: self-extinguishing
- G. All joints shall be non-permanent restrained- either groove and spine or Victaulic, unless otherwise approved by the Engineer or SWSC. Glued joints are not allowed unless approved by the Engineer or SWSC. All joints shall be water tight.
- H. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron and Steel (AIS) as follows:
 - 1. North America shall mean the United States, Canada, and Mexico,
 - 2. Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,
 - 3. Incidental parts may be purchased/obtained from other counties to provide a finished product, in accordance with the Springfield Water and Sewer Commission Material Specifications, and
 - 4. Assembled shall mean castings and sourced parts are put together to build a finished product, or
 - 5. The finished product shall meet all the requirements of the AIS language guidance issued by the EPA in 2014 and 2015. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
- I. 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 ensure 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.
- J. 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 the Springfield Water and Sewer Commission Material Specifications to include the applicable AWWA Standards.

2.2 TEMPORARY WATER MAINS

- A. Temporary water mains, connections, and branches 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.
- B. Temporary water mains shall be a minimum of 4-inch diameter when connected to a permanent hydrant, providing water to temporary hydrants, and providing water to permanent fire services, other large diameter water services, or as required by the Engineer or SWSC.
- C. 2-inch temporary water mains are allowed when supplying water for ¾-inch through 2-inch water services only, unless otherwise approved by the Engineer or SWSC.

2.3 <u>TEMPORARY VALVES</u>

- A. The same make and model of valves shall be utilized throughout the project to facilitate the Springfield Fire Department and the SWSC's operation of temporary valves with a single type of tool.
- B. All valves shall be provided with removable handles.
- C. Temporary valves for PVC water mains shall be butterfly valves rated for 250- PSI.
- D. 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.
- E. The vane/disc shall be enclosed in ductile iron housing in accordance with ASTM A-536, grade 65-45-12.
- F. The vane/disc shall be ductile iron in accordance with ASTM A-536, grade 65- 45-
- G. The vane/disc shall be rubber encapsulated with grade T nitrile compound conforming to ASTM D-2000, designation 5BG615A14B24.

2.4 <u>TEMPORARY HYDRANTS</u>

- A. Temporary hydrants shall be made of the same materials as temporary water mains and valves.
- B. Temporary hydrants shall be provided with one (1) 4-inch valve, 4-inch by 4-inch tee, 4-inch pipe, two (2) 90-degree bends and one (1) 45-degree bend and a 4-1/2-inch National Standard Thread (NST) nozzle. A 4-1/2-inch by 2-1/2-inch tee and two (2) 2-1/2-inch NST nozzles may be allowed if the SFD and SWSC approve. Requests for the 2-1/2-inch nozzle shall be provided in writing to the Engineer and SWSC during the submittal process.

2.5 TEMPORARY WATER HOSE, WATER SERVICE HOSE, AND HOSE FITTINGS

- A. Temporary water hose, water service hose, and hose fittings shall be inert material that will not impart a taste into the water.
- B. No garden hose, hydraulic hose, or air hose is allowed.
- C. Barbed fittings made of brass are allowed to connect the hose to the temporary water shut off valve and spigot of meter valve.
- D. Temporary water service hose, and hose fittings shall be rated for 200 PSI.

2.6 TEMPORARY WATER SERVICE SHUT-OFF VALVE

- A. Temporary water service valves shall be 3/4-inch to 2-inch brass ball valve corporations with removable handles.
- B. Temporary water service valves shall have AWWA corporation cock (CC) taper thread inlet and outlet threads

2.7 TAPPING SADDLES

A. As specified in Section 02665 – Water Piping, Valves and Appurtenant Work and in accordance with Springfield Water and Sewer Commission – Material Specifications, 4.3 – Tapping Saddles.

PART 3 - PART 3 EXECUTION

3.1 INSTALLATION

- A. Temporary water pipe shall not be installed without the prior approval of the Engineer and Owner.
- B. A recommended layout of the temporary water pipe and connections to the existing distribution system has been provided in the Contract Drawings. The Contractor may propose an alternate layout, but must submit plans as indicated below:
 - 1. The Contractor shall submit a plan for the proposed layout of the temporary water pipe and connections to the existing distribution system for the Engineer's approval. This plan shall be drawn on a clean set of project drawings and the temporary water pipe layout shall be consistent with the Contractor's proposed sequence of operations. Proposed changes in the layout of temporary water piping that the Contractor wishes to make as the work proceeds shall also be submitted for the Engineer's approval. The plan shall also address how pipe will be laid at catch basins and driveways, address how pipe will cross intersections, provide the make and model of all valves to be utilized, provide the type of temporary water piping to be utilized, address pedestrian safety issues (including but not limited to the brass sampling tap locations), and confirm the Contractor's intent to follow disinfection procedures described herein.
- C. 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.
- D. Temporary water pipe is to be laid in the gutter line as shown on the drawings. At street and driveway intersections, the Contractor shall cut a straight line in the existing bituminous paving and lay the temporary water pipe in a shallow trench covered with temporary surfacing, as shown on the drawings.

- E. The Contractor will be required, where necessary, to ramp over all by-pass piping to provide for wheelchair access on affected sidewalks. Ramping shall be in accordance with ADA (American with Disabilities Act) regulations.
- F. At the Engineer's option, the Contractor may be allowed to use hose to come around bend, 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.
- G. Sanitary precautions shall be satisfactory to the Engineer 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 chlorinated prior to its use in accordance with AWWA C651 and the SWSC's requirements as described in Section 02665.
- H. All temporary pipes shall have valves installed that meet the approval of the Engineer. A valve shall be provided at each hydrant connection and each tap hole connection. Main line valves shall be located no further than 500-ft apart when directed by the Engineer. Handles shall be removed from temporary hydrants. Main line temporary valves may require the handles be removed at the discretion of the Engineer and/or SWSC.
- I. Sample taps shall be furnished and installed on temporary water pipe in the same manner specified in Section 02665 for permanent water mains.
- J. 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.

3.2 TEMPORARY CONNECTION TO EXISTING WATER MAINS

- A. At some locations, as directed or approved by the Engineer or the SWSC, it may be necessary to fill the existing water mains from hydrant with BFP in order to supply the temporary water piping with water service.
- B. 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.
- C. An alternative connection to an existing water main may be allowed, but requires approval of the Engineer and SWSC 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.
- D. At locations, as approved or directed by the SWSC, where connections for temporary water piping are to be made underground to the existing water mains with corporation stops or wet taps, the Contractor 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 Contractor 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 the SWSC, backfill the excavation and install temporary bituminous pavement. When the need

for the temporary water service has ceased, the Contractor 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.

E. Payment for corporation stops and accessories, and all labor for connecting the temporary bypass pipe to the existing water main shall be included in the unit price for Temporary Water Pipe bid on the bid form.

3.3 TEMPORARY FIRE HYDRANTS

- A. Where fire hydrants are bypassed, the Contractor shall furnish, install, maintain, and remove temporary hydrants. The temporary hydrant shall be placed within 10 feet and on the same side of the street as the hydrant to be out of service, unless otherwise directed by the Engineer or SWSC. 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 2-1/2-inch nozzles, if approved by the Engineer or SWSC, for fire hose attachment. Nozzles shall be threaded for cap and grooved for fire hose attachment, using National Standard Thread.
- B. Temporary hydrants shall be staked to the ground with a 1-inch diameter steel rebar approximately 4-feet long. The rebar shall be 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.
- C. 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 Contractor shall test all temporary hydrants and valves to be sure that they are in proper working order.
- D. The same type of temporary hydrant, which include uniform wrenches and nuts, shall be utilized throughout the project.
- E. Once put into use, the temporary hydrants shall be maintained by the Contractor until the existing hydrants and or new hydrants are restored to service.
- F. Any existing hydrants that are out of service shall be "bagged" by the Contractor and reported to the Fire Department as being out of service.
- G. Payment for temporary hydrants and all labor shall be included in the unit price for Temporary Water Pipe bid on the bid form.

3.4 TEMPORARY WATER SERVICE TO BUILDINGS

- A. Temporary water service connections shall be made to the temporary water pipe with a tap of the appropriate size.
- B. 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.

- C. The temporary hoses shall generally be laid up the side of driveways, and shall be as inconspicuous as possible for their entire length.
- D. 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.
- E. In cases where a temporary service connection needs to be made on a 4 or 6-inch service, two 2-inch corporation stops with saddles shall be tapped into the existing service pipe.
- F. The Contractor 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.
- G. Contractor shall flush and disinfect each individual temporary water service per SWSC's Guidelines and Policies.
- H. Payment for temporary water services to buildings and all labor shall be included in the unit price for Temporary Water Pipe bid on the bid form.

3.5 TEMPORARY BYPASS SYSTEM SEQUENCE AND REQUIREMENTS

- A. Contractor shall connect onto the 4-1/2-inch pumper connections on existing and new hydrants at locations shown on the Contract Drawings.
- B. Contractor shall install temporary hydrants after at each connection to new hydrants or existing hydrant used as part of the temporary bypass system.
- C. Contractor shall install a 4-inch valve and BFP/meter after each temporary hydrant.
- D. Contractor shall install temporary bypass piping, valves and fittings at the locations shown on the Contract Drawings and in accordance with the Contract Documents.
- E. Contractor 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.
- F. Contractor 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.
- G. Contractor 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.
- H. Contractor 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 bypass piping.
- I. Contractor shall provide a minimum 2-inch valves and or taps as required to flush the temporary bypass piping, unless otherwise approved by the Engineer or SWSC.
- J. Contractor shall flush and disinfect entire by-pass system before connecting individual water services per SWSC's Guidelines and Policies.
- K. Contractor shall provide all material (including, but not limited to pipe, valves and fittings), labor, and equipment to perform above.
- L. SWSC to provide bacteria sampling service.

- M. The Contractor shall connect, flush, and disinfect each individual temporary water service to each home to be out of service as described above.
- N. The Contractor shall maintain temporary water piping at all times. The Contractor shall provide to the SWSC, the local DPW, local police department, and the local fire department a 24-hour emergency contact person with a cell phone number that can be available on site within 30 minutes. The Contractor's emergency staff shall have vehicles, equipment, tool and parts to maintain the temporary water pipe if it is broken or out of service for any reason.
- O. Upon completion of the new replacement water main and services, the Contractor shall remove all temporary water piping and restore site to original condition.
- P. Temporary bypass piping shall be disinfected and sample in the same manner as permanent water piping.
- Q. A flushing device as shown on the **Flushing Device Detail (W-10) in the Appendices** shall be adapted onto the temporary bypass piping.

SECTION 02665

WATER MAINS AND APPURTENANCES

PART 1 - GENERAL

1.1 **SUMMARY**

- A. Refer to the following specifications for water main and appurtenance requirements, as provided as an Appendix to this Project Manual. The content of this section supplements those requirements.
 - Springfield Water and Sewer Commission Guidelines and Policies Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020
 - Springfield Water and Sewer Commission Material Specifications Liberty Street and Westford Circle Water Main Replacement Project - Version 4 – November 1, 2020
 - 3. Springfield Water and Sewer Commission –Standard Details Liberty Street and Westford Circle Water Main Replacement Project *Version 4 –August 12*, 2021
 - 4. City of Springfield Manual for Occupancy of Public and Private Ways within the City of Springfield *June 5*, 2017

1.2 SUBMITTALS

A. Submit shop drawings and product data in accordance Section 01340 - Submittals.

1.3 INSPECTION AND TESTING

- A. All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Engineer certificates of such tests.
- B. Pipes and fittings shall be subjected to a careful inspection and a hammer test just before being laid or installed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Refer to referenced requirements in Part 1.1.

PART 3 - EXECUTION

3.1 GENERAL

- A. Refer to referenced requirements in Part 1.1.
- B. Trenchless replacement or pulling of water mains and water services will not be allowed unless approved by Owner
- C. All proposed water main connections to the existing water distribution system shall be visually inspected for leaks at static pressure prior to backfilling. Prior to the Owner re-energizing the existing water main, the new connection shall be properly thrust restrained with all new joints and fittings outside of the hydrostatic test limits

exposed for leak inspection.

3.2 ABANDONMENT OF EXISTING WATER MAINS

- A. Refer to the Contract Drawings for water mains to be abandoned.
- B. The Contractor shall not commence with cutting, plugging, and abandonment work until a replacement water main with all service connections has been installed, pressure tested, disinfected and accepted for use by the Owner.
- C. Contractor shall dewater the existing water main to be abandoned in its entirety. Once the main has been dewatered, the Contractor shall check for potential sources feeding the abandoned main prior to deactivation.
- D. Once the water main has been dewatered and all potential sources feeding the abandoned water main have been eliminated, the Contractor shall cut and cap the main at the locations indicated on the Contract Drawings. Capping of the main shall include the installation of a plug and clamp in a manner approved by the Owner. The Contractor shall encase each end cap in a minimum of 6" of 3,000-psi concrete to eliminate potential penetration by groundwater.
- E. All water main appurtenances, such as hydrants, valves, valve boxes and curb stops shall be removed by the Contractor. The Contractor is responsible to dispose of all appurtenances removed unless directed otherwise by the Owner.
 - 1. Closing valves, removing the valve stem and backfilling will not be permitted. All valves, valve stems and associated valve boxes shall be removed in their entirety.
 - 2. The Owner shall bag all hydrants in the project area that become non-usable during the abandonment procedures. The Contractor shall report to the Springfield Fire Department all hydrants that are out of service. Hydrants shall remain "bagged" until the hydrant(s) are physically removed from the project area.
 - 3. Hydrant laterals shall be cut, capped and removed to within 6" of the connection with the abandoned main.
- F. All excavations shall be backfilled in accordance with Section 02200.
- G. All surface restorations shall be in accordance with Section 02513.
- H. Placement of flowable fill within pipelines 12" or smaller in diameter is not required for abandonment.

END OF SECTION

SECTION 02751

SEWER FLOW CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: During the television inspection of sewers (sanitary and storm), the Contractor shall maintain and control flow around the pipe segment(s) or structure(s) that are temporarily out of service. Existing sewer services shall remain live at all times during the progress of the Work. All temporary pumping equipment shall meet the requirements outlined in local noise regulations.
- B. Additional Requirements Specified Elsewhere:
 - 1. Summary of Work: Section 01010
 - 2. Submittals: Section 01340
 - 3. Sewer Line Cleaning: Section 02752
 - 4. Television Inspection of Sewers: Section 02753

1.2 SUBMITTALS

- A. In accordance with the requirements of Section 01340. Additional specific information required is listed below.
 - 1. Proposed schedule, sequence of construction, duration of activities and description of sewer control methods to be utilized for each element of the project.
 - 2. Technical data (including capacity and fuel tank size) of any portable temporary pumping equipment to be used during normal Contractor work hours.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.1 COORDINATION OF WORK

- A. Provide all labor and equipment necessary to coordinate work of this section and maintain communications.
- B. Notify all personnel, including but not limited to the Owner, Engineer, and Utility Companies seven days in advance of any temporary bypass pumping work. The Owner will identify personnel to be notified in addition to those identified by the Contractor.
- C. Contractor shall coordinate temporary bypass pumping operations with the Owner and Engineer on a daily basis.

3.2 <u>PERFORMANCE</u>

A. General

- 1. The Contractor shall install and test all sewer flow control methods to the satisfaction of the Owner and Engineer prior to proceeding with the Work.
- 2. The Contractor shall be solely responsible for clean-up, repair, property damage costs and claims resulting from failure of the diversion system.

B. Plugging or Blocking:

- 1. Insert plug at a manhole upstream of line to be inspected and tested.
- 2. Plug shall be so designed that all or any portion of the flows can be released.
- 3. Flows shall be shut off or substantially reduced during line testing.

C. Pumping and Bypassing:

- 1. When required, supply the necessary pumps, conduits and other equipment (including standby equipment) to divert the flows around the line in which work is being performed.
- 2. If required, furnish the necessary labor and 24-hour supervision to set up, test and operate the pumping and bypassing system.
- 3. Any temporary pumps, piping, fuel storage, or other appurtenances associated with the portable temporary pumping equipment shall be either located above the 100-year flood elevation or protected against flotation or other damage which would be caused by a flood event.

END OF SECTION

SECTION 02752

SEWER LINE CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Provide all equipment necessary for the proper cleaning of the sewers (sanitary and storm) prior to the closed circuit television inspection.
- B. Related Work Specified Elsewhere: Closed circuit television inspection are specified in this Division.

PART 2 - PRODUCTS

2.1 <u>MATERIALS</u>

- A. High Velocity Hydro-Cleaning Equipment shall:
 - 1. Have a minimum of 400 feet of high pressure hose.
 - 2. Have multiple high velocity nozzles, as follows:
 - a. Standard 35 degree nozzle with multiple rear jets and one front jet.
 - b. Sand nozzle capable of transporting sand and gravel to the downstream manhole; and
 - c. Rotating nozzle for removal of grease and scale.
 - 3. Include a high velocity gun for washing and scouring manhole walls and floor.
 - 4. Be capable of producing flows from a fine spray to a long distance solid stream.
 - 5. Include a water tank, auxiliary engines and pumps, and a hydraulically driven hose reel.
 - 6. Have equipment operating controls located above ground.

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Select cleaning equipment based on the conditions of the lines at the time the work commences.
 - 1. Light cleaning (small amounts of debris exist within the sewer line): Use high pressure water jetting equipment, brushes and swabs.
 - 2. Heavy cleaning (large deposits of debris or heavy root growth exist within the sewer line): Use high pressure water jetting equipment specifically designed for the intended use.
- B. Use selected equipment to remove all dirt, grease, rock and other deleterious materials and obstructions.
- C. Protect existing sewer lines from damage caused by improper use of cleaning equipment.
- D. Take precautions to avoid damage or flooding to public or private property being served by the line being cleaned.
- E. Removal of Materials:
 - 1. Remove all solids and semi-solids at the downstream manhole of the section being cleaned.

- 2. Passing material from one section of a line to another will not be permitted.
- F. Disposal of Materials: Remove from the site and dispose of all solids or other waste materials recovered during the cleaning operations in an approved manner.

3.2 FIELD QUALITY CONTROL

A. Acceptance of this portion of the work may be made upon completion of subsequent television inspection and shall be to the complete satisfaction of the Engineer.

END OF SECTION

SECTION 02753

TELEVISION INSPECTION OF SEWERS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish all necessary labor, materials, supervision and equipment to satisfactorily inspect gravity sewer lines, sewer laterals, and combined sewer overflows (CSOs) after installation of water lines and services in the vicinity of the sewers by means of a closed circuit television (CCTV) system. Sewer mains and sewer laterals to be inspected are specified in tables 1 and 2, at the end of this Section.
- B. Related Requirements:
 - 1. Section 01570 Traffic Regulation
 - 2. Section 02751 Sewer Flow Control
 - 3. Section 02752 Sewer Line Cleaning

1.2 SUBMITTALS

- A. Records and Reports:
 - 1. Printed records shall be provided, reflecting location of defects, service connections, etc., and shall be recorded per PACP standards and stored to a NASSCO-certified digital reporting software:
 - a. Keep records and supply to the Engineer when the work has been completed.
 - b. Show the exact location in relation to adjacent manholes, of each infiltration point discovered by the television camera.
 - c. Show locations of laterals, unusual conditions, roots, break-in storm sewer connections, collapsed sections, presence of scale and corrosion, and other discernible features.
 - 2. Inventory the houses and apparent empty lots bordering each section of sewer line that is inspected and compare results to the number and location of house services found during the inspection. Log inconsistencies and report them to the Engineer.
 - 3. Database
 - a. One copy of the NASSCO PACP Exchange database shall be provided database in digital format (MS Access).
 - 4. Video / Photographs:
 - a. Two copies of the video shall be provided in DVD format, downloaded or output from a NASSCO certified software: one copy to the Engineer and one copy to the Owner.
 - b. The video shall be digitally recorded, indexed by pipe section (labeled by manhole number or other means acceptable to Engineer) and allow for printing of still photographs.
 - c. Photographs shall be printed at Engineer's request and shall be identified on the back as follows:

Date	; Section: MH#	to MH#	
Diameter of Sewer	; Distance from MH#	is	LF
Description of item ph	otographed		

1.3 COORDINATION

- A. Coordinate all work with the Springfield Water and Sewer Commission prior to the start of work.
- B. CCTV work shall be done after installation of a segment of water line and backfill, but prior to paving of that section.

1.4 QUALITY ASSURANCE

A. CCTV work shall be completed and delivered per the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) standards. Operators of CCTV equipment shall be NASSCO PACP certified.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. The cameras shall be designed and constructed for sewer line inspection work. The mechanical design of the lens shall allow it to turn and rotate 360 degrees to provide a close up view of sewer pipe walls and sewer service pipes. The camera shall be designed to maintain proper orientation of the picture while the lens is turning and rotating.
- B. The cameras shall be operative in 100% humidity conditions.
- C. The lighting for the cameras shall be suitable to allow a clear picture of service pipes and the entire periphery of the mainline sewer pipe, such that joints, root intrusions, cracks, offset joints, deposits, etc. can be seen and identified by the Engineer.
- D. The lens focus and rotational capabilities and the light intensity will be remotely controlled from an above ground television "studio".
- E. The cameras shall produce a continuous, full color picture with a quality acceptable to the Engineer.

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Flow Control:
 - 1. A minimum of 75% of the periphery of the sewer line shall be visible at all times.
 - 2. The Engineer may require that the line be plugged so that the entire periphery can be inspected.
- B. Sewer Cleaning:
 - 1. Conduct sewer cleaning by means of jetting the main lines.
- C. Operation:
 - 1. Perform inspection of sewer lines and laterals after lines have been suitably cleaned.

- 2. Lines shall be suitably isolated from the remainder of the sewer line as required.
- 3. Move the cameras through the line in either direction at a moderate rate, not to exceed 30 feet per minute, as recommended by NASSCO.
- 4. The Engineer may require Contractor to pull cameras back to get a second view of a section of the pipe.
- 5. Use manual winches, power winches, television cable reel powered rewinds, high-pressure hose and reels on jet-cleaning trucks, or a flexible pole, to move the camera through the sewer.
- 6. If, during the inspection operation, the camera will not pass through the entire pipe section, the Contractor shall set up the equipment so that the inspection can be performed from the opposite manhole on the pipe segment.
- 7. The screen monitor and winch operators shall be in full communication at all times.
- 8. Remove all wires, screens, sand bags, etc. used in the television inspection process from the sewers at the completion of inspection of each sewer section.

D. Measurement:

1. Measurement for location of defects, service connections, etc., shall be accurate to two tenths (0.2) of a foot over the length of the section being inspected.

TABLE 1
CCTV AND CLEANING OF MAIN LINE SEWERS

Street	Pipe Material & Size	Manhole # Start	Manhole # End
Westford Circle	12" VCP	SMH #111A	SMH #1116
Westford Circle	10" VCP	1102	1116
Westford Circle	10" VCP	1112	110C
Westford Circle	10" VCP	1104	1112
Westford Circle	10" VCP	1106	110E

TABLE 2 CCTV INSPECTION LOCATIONS

Main Line Sewer Cleaning	g & Inspection
Street	Property Address
Massachusetts Ave	141
Westford Circle	46-48
Westford Circle	62-64
Westford Circle	68-70
Westford Circle	72-74
Westford Circle	98-100
Westford Circle	102-104
Westford Circle	114-116
Westford Circle	118-120
Westford Circle	124-126
Westford Circle	128-130
Westford Circle	134-136

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Westford Circle	152-154
Westford Circle	158-160
Westford Circle	72-74
Westford Circle	114-116
Westford Circle	118-120
Westford Circle	124-126
Westford Circle	128-130
Westford Circle	134-136
Westford Circle	152-154
Westford Circle	158-160
Westford Circle	192-194
Westford Circle	202
Westford Circle	206-208

END OF SECTION

SECTION 03300A

CAST-IN-PLACE CONCRETE (SHORT FORM)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cast-In-Place Concrete indicated on the Contract Drawings
- B. Formwork
- C. Concrete finishing, curing, modifications and repairs
- D. Concrete testing

1.2 RELATED SECTIONS

- A. Section 01340 Submittals
- B. Section 01400 Quality Control

1.3 REFERENCE STANDARDS

- A. Springfield Department of Public Works Standard Engineering Details.
- B. Massachusetts Department of Transportation "Standard Specifications for Highways and Bridges", dated 1988.
- C. Massachusetts Department of Transportation "Supplemental Specifications to the 1988 English Standard Specifications for Highways and Bridges", dated April 1, 2019. These supplemental specifications and 1988 Standard Specifications for Highways and Bridges will be jointly referred to as the Mass DOT Standard Specifications.

1.4 REFERENCES

- A. This section contains references that are applicable to this Specification Section. The applicable edition of the indicated references shall be the version that was the most current at the time of the Advertisement of Bids. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, whether or not the document has been superseded by a version with a later date, discontinued, or replaced.
- B. ACI 117/117M Specifications for Tolerances for Concrete Construction and Materials and Commentary
- C. ACI 301/301M Specifications for Structural Concrete
- D. ACI 302.1R Guide to Concrete Floor and Slab Construction
- E. ACI 304.2R Guide to Placing Concrete by Pumping Methods
- F. ACI 306.1 Standard Specification for Cold Weather Concreting
- G. ACI 306R Guide to Cold Weather Concreting
- H. ACI 308.1/308.1M Specification for Curing Concrete
- I. ACI 318/318M Building Code Requirements for Structural Concrete and

- Commentary
- J. ACI 347R Guide to Formwork for Concrete
- K. ACI 350/350M Code Requirements for Environmental Engineering Concrete Structures
- L. ACI 355.2 Qualification of Post-Installed Mechanical Anchors in Concrete & Commentary
- M. ACI 355.4/355.4M Qualification of Post-Installed Adhesive Anchors in Concrete and Commentary
- N. ACI SP-066 ACI Detailing Manual
- O. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- P. ASTM A675/A675M Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties
- Q. ASTM A706/A706M Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- R. ASTM A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- S. ASTM C31/C31M Standard Practice for Making and Curing Concrete Test Specimens in the Field
- T. ASTM C33/C33M Standard Specification for Concrete Aggregates
- U. ASTM C39/C39M Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- V. ASTM C40 Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
- W. ASTM C42/C42M Standard Test Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- X. ASTM C88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- Y. ASTM C94/C94M Standard Specification for Ready-Mixed Concrete
- Z. ASTM C131/C131M Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- AA. ASTM C150C150M Standard Specification for Portland Cement
- BB. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete
- CC. ASTM C172 Practice for Sampling Freshly Mixed Concrete
- DD. ASTM C231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- EE. ASTM C260/C260M Standard Specification for Air-Entraining Admixtures for Concrete
- FF. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- GG. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete
- HH. ASTM C535 Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- II. ASTM C595/C595M Standard Specification for Blended Hydraulic Cements
- JJ. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

- KK. ASTM C881/C881M Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
- LL. ASTM C989/C989M Standard Specification for Slag Cement for Use in Concrete and Mortars
- MM. ASTM C1059/C1059M Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete
- NN. ASTM C1077 Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- OO. ASTM C1157/C1157M Standard Performance Specification for Hydraulic Cement
- PP. ASTM C1240 Standard Specification for Silica Fume Used in Cementitious Mixtures
- QQ. ASTM C1260 Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
- RR. ASTM C1293 Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
- SS. ASTM C1315 Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
- TT. ASTM C1567 Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
- UU. ASTM C1602/C1602M Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
- VV. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension
- WW.ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- XX. ASTM E1155 Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers
- YY. AWS D1.4/D1.4M Structural Welding Code Reinforcing Steel
- ZZ. Concrete Reinforcing Steel Institute -10-MSP Manual of Standard Practice
- AAA. Concrete Reinforcing Steel Institute Placing Reinforcing Bars
- BBB. ICC-ES AC58 Acceptance Criteria for Adhesive Anchors in Masonry Elements
- CCC. ICC-ES AC308 Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301/301M, ACI 117/117M ACI 306.1 and ACI 308.1/308.1M, except as modified here-in.
- B. All curing, finishing and repair materials shall meet all Federal and State regulations pertaining to Volatile Organic Compounds (VOC) Compliance.
- C. Contractor performing flatwork finishing of concrete slabs shall provide at least one (1) flatwork finisher certified as an ACI Concrete Flatwork finisher.
- D. Expansion and epoxy anchors shall meet the following requirements:
 - 1. Expansion anchors shall be qualified for earthquake loading (use in cracked concrete) in accordance with ACI 355.2.
 - 2. Epoxy anchors shall be qualified for earthquake loading (use is cracked concrete) in accordance with ACI 355.4.

- 3. Epoxy anchors installed shall be qualified in accordance with ACI 355.4 requirements for sensitivity to installation direction.
- 4. Epoxy anchors shall be installed by personnel certified by an applicable certification program that includes written and performance tests in accordance with ACI/CRSI Adhesive Anchor Installation Certification program

1.6 QUALIFICATIONS OF INDEPENDENT TESTING LABORATORY

- A. Independent Testing Laboratory shall conform to concrete testing requirements of ASTM C1077 and ASTM E329.
- B. Key personnel must be qualified and experienced in concrete quality assurance.
- C. Perform concrete field quality control testing with personnel certified as an ACI Concrete Field-Testing Technician, Grade 1 according to the American Concrete Institute (ACI).

1.7 SUBMITTALS

- A. Submit shop drawings for concrete and masonry reinforcement prior to fabrication, showing bar bends, details and placement and certified copies of Mill Test Reports for the reinforcing steel materials analysis. Conform to ACI SP-066. Details shall include:
 - 1. Sizes, dimensions, and locations for reinforcement and supports
 - 2. Bending diagrams and schedules
 - 3. Splices
 - 4. Cover and clearances
 - 5. Class designation and details for bar supports
 - 6. Pertinent reinforced concrete details with dimensions and elevations
 - 7. Embedded items furnished by other trades and/or under other sections of the specification that are to be cast in concrete where interference with reinforcing steel bars may occur
 - 8. Show reinforcement on plan views of slabs, wall elevations and sections, beam elevations and details. Provide plan details at wall intersections and openings.
- B. Submit Concrete Mix designs including field performance test results which meet the criteria specified in ACI 301, Section 4. Mix design shall include:
 - 1. Proportions for all ingredients, 28-day design compressive strength, water to cementitious materials ratio, admixture dosages, slump, and air content.
 - 2. Cement Manufacturer's Certificates of conformance with ASTM C150 taken during the last 90 days.
 - 3. Supplementary Cementitious Materials: Source and test reports with certificates of conformance with ASTM C618 for fly ash and ASTM C989/C989M for slag cement for actual material to be used in the Work taken during the last 90 days.
 - 4. Aggregate: data not older than 90 days, except test data for soundness, abrasion, alkali reactivity not older than 12 months. Fine and coarse aggregate data shall include:
 - a. Sources
 - b. Specific Gravity
 - c. Sieve analyses per ASTM C33/C33M, including fineness modulus of fine aggregate
 - d. Organic impurities for fine aggregate per ASTM C40

- e. Potential alkali reactivity (except not required if a cement containing less than 0.60% alkalis is used, per ASTM C33/C33M), per ASTM C1260, ASTM C1293, or ASTM C1567
- f. Soundness per ASTM C88
- g. Abrasion for coarse aggregate per ASTM C131/C131M and ASTM C535
- 5. Product data and material safety data sheets for concrete admixtures.
- 6. Test reports by testing agencies meeting ASTM E329:
 - a. Field test data used to determine the standard deviation used for establishing the required average design strength, and field test data documenting that the proposed concrete proportions will produce an average compressive strength equal or greater than the required average compressive strength, shall be from within the previous 12 months.
 - b. Laboratory trial batch data shall be from with the previous 24 months.
- C. Submit product data and material safety data sheets for concrete accessories.
- D. Submit sample concrete mix delivery slip that shall include the following information:
 - 1. Serial number of ticket
 - 2. Date and project location
 - 3. Name and location of ready mixed concrete plant
 - 4. Truck number, time loaded, cubic yards delivered
 - 5. Mixture design
 - 6. Quantities of admixtures, with brand names
 - 7. Quantities and types of cement, fly ash and/or slag
 - 8. Quantity of water including quantity of water withheld
 - 9. Quantities of fine and coarse aggregate including moisture content, nominal maximum aggregate size
 - 10. Quantity of water added subsequent to plant batching
 - 11. Unloading time and location
- E. Submit product data and material safety data sheets for form release agent.
- F. Submit product data for epoxy adhesive anchors. Data shall include:
 - 1. Material properties of anchors and epoxy adhesive
 - 2. ICC-ES AC58 (creep test) report
 - 3. ICC-ES AC308 report
 - 4. Allowable and ultimate loads of the anchor system
 - 5. Storage requirements
 - 6. Installation requirements including:
 - a. Drilling method (diamond drill bit shall be prohibited)
 - b. Drill bit diameter and depth of hole for each size anchor
 - c. Hole cleaning procedure and required condition of hole
 - d. Requirements for discarding initial discharge to ensure proper mixing
 - e. Hole filling procedure
 - f. Time period when anchor cannot be contacted or otherwise disturbed
 - g. Gel and cure times as a function of temperature
 - h. Installation temperature requirements for cartridges and base material
- G. Submit product data and sample for form ties.

- H. Submit a conduit layout plan under the appropriate sections of Division 16 prior to submitting reinforcing steel shop drawings.
- I. Submit methods to be used to protect the concrete during cold weather placements. The Engineer's review shall be for information only as the Contractor is responsible for the means and methods of protection of concrete placed during cold weather.
- J. Submit methods to be used to protect the concrete during hot weather placements. The Engineer's review shall be for information only as the Contractor is responsible for the means and methods of protection of concrete placed during hot weather.
- K. Submit product data and material safety data sheets for curing compounds, floor sealers and floor hardeners. Indicate the intended use and location for all products.
- L. Submit product data and material safety data sheets for repair materials. Indicate the intended use and location for all products.
- M. Submit curing methods.
- N. Submit qualifications of flatwork finisher.
- O. Independent Testing Laboratory will submit one copy each of all test reports to each of the following: Engineer, Resident Project Representative, Contractor and concrete supplier. Reports shall indicate the following information:

Project Name Air content

Placement Location Cure box min/max temps

General Contractor Cylinder Nos Cylinder weights Concrete supplier Technician Date of breaks Break type Date cast Break load Date picked up Design strength Break strength Air temp Truck Arrival Time Concrete temp Truck Unload Time Lab/Field cured Cylinder size

Final slump

- P. Independent Testing Laboratory will submit reports within 5 days of testing or inspection.
- Q. Independent Testing Laboratory will telephone the Engineer within 24 hours if tests indicate deficiencies.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Undamaged smooth form facing materials such as plywood, hardboard, metal and plastic that will produce a smooth form finish with fins and offsets not exceeding 1/8 inch. Surfaces shall be clean, free of scratches, mars and discolorations.
- B. Steel: Minimum 16 ga. sheet, well matched, tight fitting, stiffened to resist loads without excess deflection.
- C. Aluminum: Forms with unoxidized surfaces shall be pretreated with a calcium hydroxide and water paste followed by repeated water rinsing until hydrogen bubbles no longer form.
- D. Chamfer Corners: Chamfer, Wood Strip Type; ¾" x ¾" minimum, maximum possible length.

E. Form Ties:

- 1. Exterior backfilled walls of below grade spaces: Factory fabricated adjustable length assembly providing a minimum 1.5 inch break back dimension with a minimum 1 inch diameter tapered wood or plastic cones to leave a uniform hole for patching on both sides of the wall. All ties require a tightly fitted waterstop washer at the midpoint. Tie systems that use plug style waterstops inserted into tie holes after removal of forms are not permitted
- 2. Non-liquid retaining structures: Snap-off type, galvanized metal, adjustable lengths designed to break back at least 1 inch from finished surface or ties as indicated above.
- F. Form release agent: Non-staining colorless, compatible with finishes.
 - 1. Bio Strip WB, SpecChem by HD Supply White Cap
 - 2. StarSeal EF Bio-Release by Vexcon
 - 3. Q-2 Form Release by Dayton Superior
 - 4. Farm Fresh XL by Dayton Superior
 - 5. Clean Strip by Dayton Superior
 - 6. or equivalent

2.2 REINFORCING STEEL

- A. "Reinforcing Steel" shall include all bars, anchorages, stirrups, dowels, ties, tie-wire, chairs and other steel supports, and spacers, as noted on the Contract Drawings, specified herein, and as required for the proper completion of the Work.
- B. Bars: ASTM A615 Grade 60; deformed new materials. Cold-bent in accordance with CRSI 10-MSP
- C. Welded wire fabric: ASTM A1064/A1064M. Flat sheets are required, rolls are not permitted
- D. Tie wire: ASTM A1064/A1064M, annealed. Provide epoxy coated for epoxy-coated reinforcing and galvanized for architectural concrete.
- E. Bolsters, chairs, spacers and other supports to properly position reinforcement shall conform to the "Bar Support" recommendations of CRSI 10-MSP, and shall be of adequate strength and design to prevent displacement of reinforcement and discoloration of concrete. Where concrete surfaces are exposed to view, weather and/or moisture supports shall be Class 1 Plastic, Plastic Protected, or epoxy-coated. Supports for bottom reinforcement for slabs placed on soil or on a mud mat with no more than 3 inches of cover shall be Class 3 chairs with integral plates or precast concrete blocks not less than 4 inches square.

2.3 FABRICATION OF REINFORCING STEEL

- A. Conform to CRSI Code of Standard Practice-Fabrication.
- B. Cold bend bars.
- C. Bend bars around revolving collar of recommended size.

2.4 EXPANSION ANCHORS

- A. Approved for use in cracked concrete in accordance with ACI 355.2.
- B. Stainless steel AISI Type 316 for galvanized and aluminum fabrications; cadmium plated for painted steel fabrications.
 - 1. Hilti Kwik-Bolt TZ or Hilti HSL, by Hilti Fastening Systems

- 2. Tru Bolt Stud Anchor by Ramset Fastening System
- 3. Power-Stud by Powers Fasteners
- 4. Or equivalent

2.5 CAST-IN-PLACE CONCRETE

- A. Concrete Materials:
 - 1. Portland cement: ASTM C150/C150M; Type II. Cement shall be furnished from one source during the project.
 - 2. Blended cements: ASTM C595/595M. Do not use blended cements conforming to ASTM C595/595M if they contain cements conforming to ASTM C1157/C1157M.
 - 3. Supplementary Cementitious Materials:
 - a. Ground Granulated Blast Furnace Slag: ASTM C989 Grade 100 or 120.
 - b. Silica Fume: ASTM C1240
 - c. Fly Ash: ASTM C618 Type F
 - 4. Aggregates:
 - a. Prohibited: crushed hydraulic cement concrete for aggregate.
 - b. Fine aggregate shall consist of washed inert natural sand, free from mineral or other coatings, soft particles, clay, loam, organic or other deleterious materials conforming to the requirements of ASTM C33/C33M and the following requirements:

SIEVE NO.	PERCENT PASSING
4	95 to 100
8	80 to 100
16	50 to 85
30	25 to 60
50	5 to 30
100	0 to 10

The Fineness Modulus shall be between 2.3 to 3.1. The percentage retained between any two consecutive sieves shall not exceed 45%. Color of supernatant liquid above test sample tested in accordance with ASTM C40 shall not be darker than organic plate No. 3.

c. Coarse aggregate shall consist of a well graded crushed stone or a washed gravel conforming to the requirements of ASTM C33/C33M and the following requirements:

		PERCEN	T PASSING								
SIEVE	NO. 8 (3/8")	NO. 67 (3/4")	NO. 67 (3/4") NO. 57 (1") NO. 467 (1 1/2								
1-1/2 inch	-	-	100	95-100							
1 inch	1	100	95-100	-							
¾ inch	-	90-100	-	35-70							
½ inch	100	-	25-60	-							
3/8 inch	85-100	20-55	-	10-30							
No. 4	10-30	0-10	0-10	0-5							

No. 8	0-10	0-5	0-5	-
No. 16	0-5	-	-	-
No. 50	-	-	-	-

The limits of deleterious substances and physical property requirements shall be listed in ASTM C33/C33M, Table 4, for severe weathering regions.

- d. Aggregate reactivity testing:
 - i. Perform testing on the aggregate in accordance with ASTM C1260 (Rapid Mortar-Bar Test).
- e. Do not use aggregate having a 14 day expansion greater than 0.10% (considered potentially reactive), except if additional testing is performed as follows:
 - i. ASTM C1567 (Accelerated Mortar-Bar Test): The 14 day expansion is not greater than 0.10%, or if tested per
 - ii. ASTM C1293 (Concrete Prism Test): The 2-year expansion of concrete prisms is not greater that 0.04%,
 - iii. Cement containing less than 0.60% alkalis is used per ASTM C33/C33M
- f. Evidence of a satisfactory service record in lieu of testing for alkali reactivity is not permitted.
- 5. Water: Potable from municipal water supply or shall meet the requirements of ASTM C1602.

B. Admixtures:

- Low Range Water Reducer: MasterPozzolith 210 by BASF; WRDA with HYCOL by W.R. Grace & Company; or equivalent meeting ASTM C494 Type A.
- 2. High Range Water Reducer (superplasticiser): MasterRheobuild 1000 or MasterGlenium 3030 by BASF; Daracem 100 or ADVA 140M by W.R. Grace & Company; or equivalent meeting ASTM C494 Type F.
- 3. Water reducing-retarding agents: for use when ambient temperature is above 70°F, replace water reducing agent in whole or in part with water reducing-retarding agent meeting ASTM C494 Type D. Use amounts to produce concrete with a set time equal to that at 70°F without the retarder.
- 4. Air entraining agent: MasterAir AE 200 by BASF, DAREX II AEA by W.R. Grace & Company; or equivalent meeting ASTM C260.
- 5. Non-corrosive non-chloride accelerator: MasterSet FP 20 by BASF; PolarSet by W. R. Grace; or equivalent meeting ASTM C494 Type C or E.
- 6. Not permitted: Calcium chloride, thiocyanates or admixtures containing chloride ions.
- 7. All admixtures used for each mix design shall be from one common manufacturer.

C. Concrete Mix Design

- 1. Concrete Class:
 - a. Class A: Reinforced concrete structures

- b. Class B: Concrete Fill, Conduit and Pipe Encasements and topping for prestressed precast concrete plank
- 2. Mix Design:
 - a. Class A: f'c = 4,500 psi, max w/cm = 0.42
 - b. Class B: f'c = 3,000 psi, max w/cm = 0.50
- 3. Maximum nominal aggregate size:
 - a. Coarse aggregate shall conform to the grading given in Table 2 of ASTM C33/C33M for sizes (i.e., nominal maximum aggregate sizes) No. 67 (3/4") and No. 8 (3/8").
 - b. Class A: No. 67 (3/4")
 - c. Class B: No. 8 (3/8")
 - d. Concrete Fill:
 - i. ½": minimum thickness less than 2 ¼ inches and fills screeded into place by process equipment,
 - ii. 3/4": minimum thickness from 2 1/4 inches to less than 6 inches,
 - iii. 1 1/2": minimum thickness of 6 inches or greater
 - e. Electrical Ductbanks: 3/8"
 - f. Topping of prestressed precast concrete plank: ½"
- 4. Air entrainment:
 - a. All concrete, except as noted below, shall be air entrained in accordance with the nominal maximum aggregate size, with a tolerance of plus or minus 1.5%:
 - b. No. 8 (3/8) 7.5%
 - c. No. $67 (\frac{3}{4}) 6.0\%$
 - d. Interior concrete slabs to be hard troweled shall have a maximum air content of 3.0%. After the curing period (at which time they are protected), such slabs shall be protected from freezing temperatures for a minimum of 8 weeks. Thereafter, and for the duration of the Contract if such slabs might be subject to freezing temperatures, they shall be fully sheltered from rain, snow and all other water sources.
- 5. Cement: The proposed mix design shall contain cementitious materials in the following proportions:
 - a. Portland Cement No less than 75% of the total by weight.
 - b. Ground Granulated Blast Furnace Slag No greater than 25% of the total by weight.
 - c. Fly Ash No greater than 15% of the total by weight.
- 6. The slump shall be 3" with a 1" plus or minus tolerance at the point of delivery, without use of a high range water reducer. When a high range water reducer is used, the slump shall be as stated above before it is added, and a maximum of 8" at the point of delivery after it is added.
- 7. Water:
 - a. The amount of water carried on the aggregate and the effect of admixtures is included in the water content. Provide that water carried on the aggregate is determined periodically by test and the amount of free water on the aggregate is subtracted from water added to the mixture.

- b. Maximum amount of water: that required to produce a plastic mixture of the strength and water to cementitious materials ratio specified and the required density, uniformity and workability. Consistency of the mixture: that required for the specific placing conditions and methods.
- 8. High Range Water Reducing admixtures shall be used for all concrete to be pumped or with a specified water/cement ratio below 0.50. High range water reducer shall be added either at the concrete batch plant or on site to obtain the slumps as indicated above.
- 9. Concrete shall be furnished from one supplier and batch plant during the project.
- 10. The Concrete producer shall select the concrete mix proportions on the basis of past field performance or the use of trial mixes, both in accordance with ACI 301, Section 4, "Concrete Mixtures".

2.6 CURING MATERIALS

- A. Curing and Sealing Compound:
 - 1. Conform to ASTM C309 Type 1 Class B.
 - 2. Acceptable products:
 - a. Harris Emulsion Kurseal 309 by A.H. Harris & Sons, Inc.
 - b. Aqua-Cure VOX by Euclid Chemical Company
 - c. Starseal EF Cure by Vexcon Chemicals
 - d. Or equivalent.
- B. Curing/Hardening Compound:
 - 1. Sodium Silicate Type
 - 2. Acceptable products:
 - a. Eucosil by Euclid Chemical Company
 - b. Harris AsSuper KurHard by A.H. Harris & Sons, Inc.
 - c. Or equivalent.
- C. Curing, Sealing and Hardening Compound:
 - 1. Acrylic water based compound
 - 2. Acceptable products:
 - a. Ashford Formula by Curecrete
 - b. Starseal EF Medium Gloss by Vexcon Chemicals
 - c. Harris Super Kurseal 800 Emulsion by A.H. Harris
 - d. Or equivalent.
- D. Curing Water: Water shall be potable from a municipal water supply or shall meet the requirements of ASTM C1602, and shall be free of materials that have the potential to stain concrete. The temperature of the curing water shall not be lower than 20°F cooler than the surface temperature of the concrete at the time the water and concrete come in contact.
- E. Curing Blanket: ASTM C171. Cellulose fabric sheets with an impervious layer on one side. Conkure by Raven Industries, UltraCure by Sika Industries or equivalent.
- F. Curing Paper: ASTM C171, regular or white waterproof paper.

2.7 FINISHING MATERIALS

- A. Slab Sealer:
 - 1. Silane or Siloxane based 96% chloride ion screen

- 2. Do not apply to surfaces cured with curing compounds
- 3. Acceptable products:
 - a. Euco-Guard-100 by Euclid Chemical
 - b. SikaGard 701W by Sika Corporation
 - c. Starseal EF Weather Seal Plus by Vexcon Chenicals
 - d. Or equivalent

B. Slab Hardener:

- 1. Fluorosilicate water based.
- 2. Acceptable products:
 - a. Ultrasil 7 by Euclid Chemical??
 - b. Lapidolith by Sonneborn
 - c. Fluohard by L&M Construction Chemicals, Inc.
 - d. Or equivalent

C. Evaporation Retardant:

- 1. Water based polymer liquid evaporation retardant
- 2. Acceptable products:
 - a. E-CON as manufactured by L&M Construction Chemicals, Inc.
 - b. SikaFilm by Sika Corporation
 - c. MasterKure ER 50 by Master Builders (Caribbean??)
 - d. Or equivalent.

2.8 STORAGE OF MATERIALS

- A. Protect materials from ground and the elements.
- B. Maintain cement in dry condition.
- C. Store reinforcement and all other embedded items on skids.
- D. Keep surface applied waterstops dry.
- E. Remove defective materials from site. Do not store on site.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Conform to ACI 301.
- B. Verify lines, levels and measurements before proceeding.
- C. Erect plumb and straight. Maintain rigid. Brace sufficiently.
- D. Allow no concrete leakage. Provide continuous, straight, smooth exposed surfaces.
- E. Treat forms with form release agent prior to erecting forms. Do not apply form release agent at formed surfaces of construction joints designed with continuous reinforcement or remove all traces from formed joint prior to subsequent concrete placement. Protect reinforcing from contact with form release agent. Any and all form release agent that contacts reinforcing shall be thoroughly removed.
- F. Earth forms not permitted for below grade walls, slabs and footings.
- G. Camber formwork as necessary.
- H. Chamfer all exposed outside corners and edges 0.75 inch unless otherwise noted.
- I. Clean out inside of forms of all foreign materials prior to concrete placement.
- J. Install reinforcing steel spacers as required.
- K. Maintain specified tolerances.
- L. Maintain vertical forms and shores supporting the cast concrete for the time periods

indicated below:

- 1. Walls and Vertical Surfaces: 36 hours
- 2. Forms may be unlocked after 24 hours but shall remain in place for the indicated time periods
- 3. Time period listed above represents cumulative number of hours during which the temperature of the air surrounding the concrete is above 50°F and the concrete has been damp and no loss of moisture has occurred.
- M. Reshore as required.
- N. Form pressures increase with the use of concrete with High Range Water Reducers. Design forms accordingly.
- O. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form release agent as specified for new formwork.

3.2 <u>REINFORCING STEEL</u>

- A. Conform to the CRSI Code of Standard Practice.
- B. Do not weld reinforcement unless the Engineer takes no exceptions in writing. When permitted, welding shall be in accordance with AWS D1.4/D1.4M.
- C. Splicing reinforcing steel:
 - 1. Welded wire fabric: Install in longest sheets practical. Welded wire fabric shall be lapped 1½ wire spacings or 12 inches and securely tied at maximum 24 inches on center. Offset end laps in adjacent sheets.
 - 2. Reinforcing bars: Splices shall be located as shown on the Contract Drawings. Where not shown, splices shall be located away from areas of maximum stress, and shall be reviewed, with no exceptions taken, by the Engineer. Minimum splice lengths shall be as indicated on the Contract Drawings.
- D. Provide bar supports: on grade use concrete brick; elsewhere use manufactured wire supports.
- E. Reinforcement shall be securely tied at intersections with tie wire or clips in a manner that will keep all metal away from exposed concrete surfaces.
- F. Cutting, heating and bending of reinforcement embedded in the concrete will not be allowed
- G. All reinforcement within an area of a continuous concrete placement shall be installed, supported, and secured before beginning concrete placement.

3.3 PLACING CONCRETE

- A. Notify Engineer and Independent Testing Laboratory 24 hours' minimum prior to each placement.
- B. All reinforcement within the area of one day's concrete placement shall be tied in place, and observed by the Engineer, prior to commencing concrete placement.
- C. All concrete delivery trucks at each placement shall be tested for slump and air content.
- D. Assure placement and proper location of all embedded items.
- E. Provide concrete Delivery Slip prepared at batch plant with each truck load of concrete showing the information listed under Submittals in this Section.
- F. Water: additional water added to the mix shall be carefully monitored as follows:

- 1. Residual, wash, and/or other water in drums: completely discharged prior to concrete batching (drums backed out).
- 2. Slump adjustment: additional water shall not be added from the time of batching to the point of delivery at the Project site.
- 3. Water added after arrival at Project site: accurately metered and recorded on the delivery ticket. The amount of water withheld from batching shall be clearly indicated on the delivery slip. The total water added at the site shall include water added for the truck and water added to the drum from any initial washdown.
- G. Place concrete from mixing truck to final location quickly and without segregation.
- H. Place all concrete from the delivery truck within 90 minutes of addition of water to cement, or cement to aggregate, whichever occurs first. When air temperature is 90°F and above, this time shall be reduced to 60 minutes. These times may be exceeded only upon review with no exceptions taken by the Engineer, and only if all tests for air content, slump and temperature are also within specified limits.
- I. Standing water shall be removed from all forms (except as permitted during hot weather placements) and excavations and the Work shall be kept dry during concrete placement. No water shall be thrown on, allowed to flow over, or rise upon the concrete until it is thoroughly set.
- J. Runways shall be provided for wheeled concrete handling equipment. Runways shall not be supported upon placed reinforcement.
- K. Concrete truck chute shall conform to the following:
 - 1. Minimum slope: 3 horizontal to 1 vertical. Maximum slope: 2 horizontal to 1 vertical. Between these limits the chute slope shall be such to ensure continuous flow without segregation.
 - 2. Provide baffle at end of chute to prevent segregation. If the end of the chute is more than 3 feet above the surface of deposit, a spout is to be used. The spout is to be kept full of concrete with the end kept as near as practical to the surface of the deposit.
 - 3. The chute shall be steel or steel-lined. Aluminum chutes are not permitted. Sections of the chute shall have the same slope throughout.
 - 4. The chute is to be thoroughly flushed with water before and after each use with the water discharged outside the forms.
- L. Freefall from concrete truck discharge chute, pump hose and hopper hose: 4 feet maximum.
- M. The accumulation of concrete on the forms and/or reinforcement above the level of placement shall be avoided. The splashing of concrete upon formwork that is set for a subsequent concrete placement shall be prevented due to the resulting marks on the finished concrete.
- N. Concrete placements shall be carried out in a continuous operation until the placement of the entire section between construction joints is complete. Place against plastic concrete only.
- O. Do not place partially hardened concrete. Re-tempering is not permitted.
- P. Compacting and vibrating concrete:
 - 1. Concrete may be deposited in one or multiple layers. Consolidate each layer by mechanical internal vibrating equipment supplemented by hand spading,

rodding, and tamping as required. The depth of each layer shall not exceed the smaller of 20 inches and the depth that can be properly vibrated with the equipment used. When deposited in multiple layers, the vibrator shall penetrate the preceding layer approximately 6 inches to blend layers. Ensure that initial setting of the previous layer doesn't occur prior to placement of subsequent layer.

- 2. Do not use vibrator to move fresh concrete within the forms. Insert vibrator at approximately 18 inch intervals, and over-vibration resulting in segregation shall be prevented.
- 3. Concrete shall be thoroughly consolidated around reinforcement, embedded items and into corners of forms.
- 4. Vibratory screeds are acceptable for slabs up to 8 inches thick, however internal vibration is required in areas of load-transfer dowels and electrical conduit. Internal vibration is required for slabs thicker than 8 inches.
- Q. Placing concrete in cold weather:
 - 1. Conform to ACI 306.1 for concrete placements in cold weather as defined below. When freezing temperatures may occur during periods not defined as cold weather, concrete surfaces shall be protected against freezing for at least the first 24 hours after placement.
 - 2. Cold Weather:
 - a. Cold weather is defined as any and all periods when for more than three consecutive days the average daily outdoor temperature drops below 40°F. (The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight.) When temperatures higher than 50°F occur during more than half of any 24-hour duration, the period shall not be regarded as cold weather.
 - b. When freezing temperatures may occur during periods not defined as cold weather, concrete surfaces shall be protected against freezing for at least the first 24 hours after placing.
 - 3. Concrete shall conform to the following temperature limitations when delivered to the project site:

		Co	ncrete Thick	kness	
	Air	Less than			Greater than
Item	Temperature	12 in	12-36 in	36-72 in	72 in
	Minimum co	ncrete temper	rature as place	ed and mainta	ined
1		55°F	50°F	45°F	40°F
Mi	nimum concrete	temperature a	as mixed for i	ndicated air t	emperature
2	Above 30°F	60°F	55°F	50°F	45°F
3	0 to 30°F	65°F	60°F	55°F	50°F
4	Below 0°F	70°F	65°F	60°F	55°F

- 4. The concrete mixing temperature shall not be higher than the minimum concrete placement temperature (Items 2-4 in the table above) by more than 15°F.
- 5. An Accelerator may be used in the mix design when placing concrete in air temperatures below 50°F.

- 6. All material and equipment required for cold weather placement, protection and curing shall be available at the project site before commencing concrete placement.
- 7. Any enclosure for weather and climate protection shall be in place before depositing any concrete. Heating within the enclosure shall maintain the temperature specified with a reasonable degree of uniformity in all parts of the enclosure. All exposed concrete surfaces within the enclosure shall be kept sufficiently moist to prevent drying. Heating appliances shall not be placed in a manner so as to damage the enclosure, forms, supports, or expose any area of concrete to drying out or to excessive temperatures.
- 8. All snow, ice and frost shall be removed from the surfaces against which the concrete is to be placed including subgrade and reinforcement.
- 9. Do not place concrete on frozen ground. Insulate or heat subgrade to ensure temperature of subgrade material is above 32°F when concrete is placed.
- 10. All embedded items having a cross sectional area of 1.00 square inches or greater, including #9 and larger reinforcing steel bars shall be at a temperature not less than 10°F at time of concrete placement.
- 11. Cover, insulate and/or heat as required to protect concrete and provide frost protection beneath structure. Thermal protection shall be provided immediately after concrete placement. Except when supplemental heat is provided, the R-value of the insulation shall be per the recommendations of Chapter 9 of ACI 306R.
- R. Placing concrete in hot weather:
 - 1. Hot Weather: Job-site conditions that accelerate the rate of moisture loss or rate of cement hydration of freshly mixed concrete, including an ambient temperature of 80°F or higher, and an evaporation rate that exceeds 1 kg/m2/h.
 - 2. Temperature of concrete when placed shall not exceed 90°F. When the air temperature is 90°F and above, procedures to cool mixture ingredients shall be employed. These include:
 - a. Providing shaded storage for aggregate,
 - b. Frequent sprinkling or fog spraying of coarse aggregate,
 - c. Using chilled batch water and/or ice.
 - 3. Forms and reinforcement shall be sprinkled with cold water just prior to concrete placement. When possible, placement of slabs should be scheduled accordingly in order to minimize problems associated with direct sunlight and/or drying winds.
- S. Pumping: The inside diameter of pipes and hoses used to convey the concrete shall be a minimum of three times the maximum size aggregate of the mixture. In order to minimize altering the concrete properties, long vertical sections at the end of the pump line is prohibited. A horizontal hose run, a hose loop, or a slide gate at the end of the hose is to be used to reduce loss of entrained air.
- T. Thoroughly moisten subgrade materials prior to placing slabs on grade.
- U. When placing new concrete directly against existing concrete, clean the surface of all contamination and debris, and roughen by steel shot-blasting, abrasive (sand) blasting, or water-jetting (hydrodemolition). Use of scabblers, scarifiers, bush hammers, or pneumatic hammers is not permitted. The prepared surface shall be

- water-saturated for a minimum of six hours, and the excess water shall be removed immediately prior to placement of concrete. Apply epoxy bonding agent to the prepared surface to bond to new concrete.
- V. Provide concrete pads and foundations for all equipment as shown on Drawings or as required by the equipment manufacturer. Set anchor bolts for equipment with templates at correct elevations using manufacturer's shop drawings reviewed by the Engineer with no exceptions taken unless otherwise indicated. All equipment pads shall be sized by the Contractor and equipment supplier.
- W. Contractor shall coordinate concrete truck wash-out area with Owner.

3.4 TESTING CAST-IN-PLACE CONCRETE

- A. An Independent Testing Laboratory, selected and paid for by the Owner and directed by the Engineer and/or Resident Project Representative, shall test and sample Class A concrete for strength, slump and air content as indicated herein.
- B. The General Contractor shall notify the Independent Testing Laboratory of proposed upcoming concrete placements as follows.
 - 1. The General Contractor shall notify the Testing Laboratory of proposed concrete placements on a weekly basis.
 - 2. The General Contractor shall notify the Testing Laboratory of specific placements a minimum of 24 hours in advance.
- C. Obtain 5 standard test cylinder samples measuring 6"Ø x 12" or 8 test cylinders measuring 4"Ø x 8" for each class of concrete placed in any one day at the following frequency:
 - 1. For each 100 cubic yards of placed concrete, or
 - 2. For each placement less than 100 cubic yards
- D. Concrete cylinders shall be tested as follows:
 - 1. 6"Ø x 12" cylinders:
 - a. Test 2 cylinder at 7 days; two cylinders at 28 days
 - b. Hold one cylinder for later testing (if required)
 - 2. 4" Ø x 8" cylinders:
 - a. Test 3 cylinders at 7 days; three cylinders at 28 days.
 - b. Hold two cylinders for later testing (if required)
- E. Perform slump tests and air entrainment tests at the project site on each truck and at each sampling. Perform slump and air entrainment tests for each condition if applicable:
 - 1. Before addition of high range water reducer (when the high range water reducer is added on site instead of the batch plant)
 - 2. After addition of additional mix water withheld at the batch plant (when the high range water reducer is added on site)
 - 3. After addition of high range water reducer (all concrete).
- F. Sample concrete for testing of air and slump at the discharge end of the truck. When concrete is pumped, concrete taken for test cylinders shall be at the discharge end of the pump hose. All concrete sampled for testing shall be taken from the beginning of the concrete truck discharge. No concrete shall be placed until the testing is complete. All concrete sampled for casting of cylinders shall be taken from the middle third of the concrete truck discharge.
- G. Perform strength, slump and air entrainment tests at other times when directed by the

- Resident Project Representative.
- H. Additional testing and sampling required as a result of deficient results or improper curing shall be paid for by Owner. The cost of resampling and retesting will be determined by Engineer, and Owner will invoice Contractor for this cost. If unpaid after 60 days, this invoice amount will be deducted from the Contract Price.
- I. Contractor shall provide and maintain an insulated, heated concrete cylinder curing box, 4 foot square minimum, with a min.-max. thermometer and maintain the temperature between 60°F and 80°F. Contractor to coordinate the location and specific details of the curing box with the Resident Project Representative and Independent Testing Laboratory.
- J. Contractor shall provide access to the site at all times for the Independent Testing Laboratory Personnel.
- K. Additional concrete tests:
 - 1. Independent Testing Laboratory shall provide additional testing of in-place concrete that does not comply with the requirements of the Contract Documents or is considered substandard as directed by Engineer. Additional tests may consist of non-destructive testing, cores drilled from the area in question or load tests. Costs of additional testing will be paid by Owner. The cost of the additional testing will be determined by Engineer and Owner will invoice Contractor for that cost. If unpaid after 60 days, the invoice amount will be deducted from the Contract Price.
 - 2. When the concrete strength is substandard as defined in this Section, concrete core specimens shall be obtained and tested from the affected area. A minimum of three (3) cores shall be taken for each sample in which the strength requirements were not met. The drilled cores shall be obtained and tested in conformance with ASTM C42. Engineer will determine the size and location of the required core samples.

3.5 FINISHES

- A. Repair all defects and allow repair material to properly cure prior to finishing concrete.
- B. Clean all exposed concrete surfaces and adjoining work stained by leakage of
- C. Finish concrete surfaces as scheduled.

3.6 CURING

A. Curing: Curing shall begin immediately following the initial set of concrete or after slab surface finishing has been completed when it will not mar, erode or stain the concrete surface and shall continue after form removal. All concrete shall be cured to attain strength and durability by one of the following methods for a minimum of seven consecutive days immediately after placement:

1. Moist Cure

- a. Ponding or continuous sprinkling. Intermittent wetting and drying is not an acceptable curing method.
- b. Application of curing blankets kept continuously wet.
- c. Application of curing paper kept continuously wet. Use wet methods for the first 24 to 30 hours. Lap side joints 4 inches, and end joints 6 inches.

Tape joints or weigh down paper to prevent displacement. Repair any and all tears during the curing period. Apply paper no earlier than 24 hours, and no later than 30 hours, after finishing. The slab surface shall be maintained in a wet condition beneath the paper at all times.

- d. Contractor shall provide additional heat as required to maintain moist curing.
- 2. Application of concrete curing compounds.
 - a. For slabs, apply immediately following the disappearance of the surface water sheen after the final finishing pass. For formed concrete, apply immediately after form removal.
- B. Moisture loss from surfaces placed against wooden or metal forms exposed to heating by the sun shall be minimized by keeping the forms wet until they can be safely removed.
- C. After form removal of vertical elements, the concrete shall be cured as indicated for the balance of time remaining as specified above. All exposed concrete (tops of walls) within vertical forms shall begin moist curing within 24 hours of placement, regardless of the duration that the forms will remain in place.
- D. Cold Weather:
 - 1. Unless otherwise superseded by more stringent requirements within this Specification, conform to ACI 306.1 for placement of concrete in cold weather as defined in Part 3.6.
 - 2. Thermal protection must be provided immediately after concrete placement. Procedures for covering, insulating, housing and/or heating concrete shall be prearranged. Except when supplemental heat is provided, the R-value of the insulation shall be in accordance with the recommendations of Chapter 9 of ACI 306R.
 - 3. Concrete structures shall be covered, insulated and heated as required to prevent frost penetration beneath the structures.
 - 4. Maintain concrete at the following minimum temperature (measured at concrete surface) for a minimum protection period of 7 days:
 - a. Sections of less than 12 inch minimum dimension: 55°F
 - b. Sections of 12 to 36 inch minimum dimension: 50°F
 - c. Sections of 36 to 72 inch minimum dimension: 45°F
 - d. Sections greater than 72 in minimum dimension: 40°F
 - 5. Protect concrete from damage due to concentrated heat sources to minimize local carbonation of the concrete surfaces. Combustion heaters shall be located so they do not apply heat directly to the concrete surfaces.
 - 6. For those surfaces requiring curing compounds, reapply curing compounds every two days during heating period or at greater frequencies as required by the manufacturer.
 - 7. The temperature shall be monitored at the surface of the concrete, including corners and edges, which are more vulnerable to low temperature. The concrete surface temperature shall be recorded a minimum of twice per each 24 hour period.

- 8. Slabs, regardless of air content, shall not be exposed to freezing temperatures when exposed to rain, snow or other water sources, prior to reaching a compressive strength of 3500 psi.
- 9. Concrete shall be cooled gradually at the end of the protection period. The maximum allowable temperature drop at the concrete surfaces during the first 24 hours after the end of the curing period shall not exceed 5°F in any 1 hour and shall not exceed the following total gradual temperature drop in the first 24 hours:
 - a. Sections of less than 12 inch minimum dimension: 50°F
 - b. Sections of 12 to 36 inch minimum dimension: 40°F
 - c. Sections of 36 to 72 inch minimum dimension: 30°F
 - d. Sections greater than 72 in minimum dimension: 20°F

E. Hot Weather:

- 1. Unless otherwise superseded by the requirements within this Specification, conform to ACI 308.1 for curing of concrete in hot weather as defined in Part 3.6.
- 2. Protect concrete from plastic shrinkage cracking and rapid evaporation of water
- 3. Shade concrete from direct sun and protect from wind.

3.7 DEFECTIVE CONCRETE

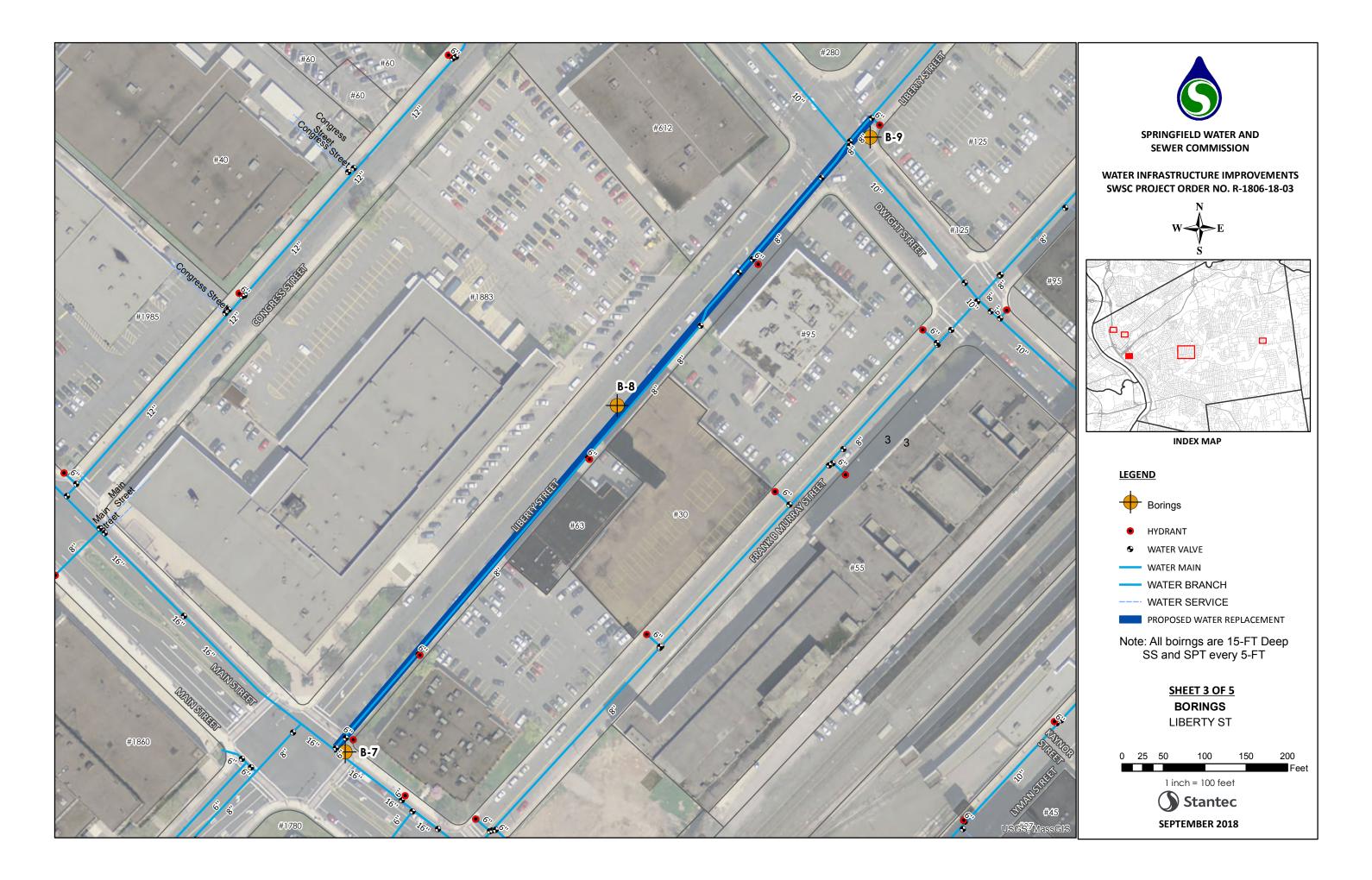
- A. Concrete work will be considered deficient if it does not conform to strength and material durability requirements (including water-to-cementitious materials ratio), location, elevation, dimension, shape, alignments, and/or appearance as required in the Contract Documents. Specific examples of deficient concrete include (but are not limited to):
 - 1. Concrete containing reinforcement that does not meet the requirements of the Contract Documents for size, quantity, strength, position, or arrangement.
 - 2. Concrete which differs from the required dimensions or locations in such a manner as to reduce the strength.
 - 3. Concrete surfaces not finished or cured in accordance with this Section.
 - 4. Concrete work in hot or cold weather that doesn't meet the requirements of the Contract Documents.
 - 5. Formed surfaces larger or smaller than specified dimensional tolerances. If the Engineer permits the Contractor to correct the error, such correction shall be as directed and in such a manner as to maintain the strength, function and appearance of the structure.
 - 6. Concrete members cast in the wrong location may be rejected and shall be removed at no additional cost to the Owner if the strength, appearance or function of the structure is adversely affected.
 - 7. Concrete exposed to view with defects which adversely affect the appearance of the specified finish shall be repaired. If, in the opinion of the Engineer, the defects cannot be repaired, the concrete may be accepted or rejected in accordance with the decision of the Engineer.
 - 8. Concrete work damaged from accidents, poor construction practices or fire.
- B. Any deficient concrete may be subject to rejection and replacement at no additional cost to the Owner if the Engineer deems necessary.

3.8 PROTECTION

- A. In addition to providing protection against hot and cold weather, provide the following additional protective measures for freshly placed concrete:
 - 1. Protect concrete against vibration until concrete has attained 33% of its 28-day strength. Do not compact soil [drive piles or blast ledge] within 100 feet of freshly placed concrete until concrete has attained 33% of its 28-day strength.
 - 2. Protect concrete against premature loads until the concrete has been in place for 28 days and the design strength has been attained (unless otherwise indicated). Premature loads include but are not limited to:
 - a. Backfilling
 - b. Loading slabs
 - c. Building CMU walls atop slabs
 - d. Installing equipment on slabs
 - e. Installing equipment atop slabs prior to completion of backfilling

END OF SECTION

APPENDIX A
Boring Logs



BOREHOLE LOG

B-7

CLIENT	Springfie	ld Water and Sewer Comm	ission		 PROJECT No. 195	5150603
LOCATION -	Main Str	eet and Liberty Street, Spr	ingfield, MA		 EXPLORATION No.	B-7
EXPLORATION	ON DATE	10/15/2018 to 10/15/2018	WATER LEVEL	Not encountered	 DATUM	

ЕУ	KPLORAT	ION DATE10/15/2018 to 10/15/2018	WA	TEF	R LEVI	EL .	Not o	encoun	<u>tered</u>		_		DAT	'UM	_				
	(ft)		F			SA	MPL	.ES								rength			
DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyı	iter C	c Pene	t & At	n Tes	rg Limi st, blow st, blov	its vs/foo		─
							in.				ı					50 6			90
- 0 -		12-inches Asphalt pavement.																	-
		Medium dense, tan coarse to fine SAND, little Silt, little Gravel. (SM)			SS	1	13	18 11 7 9	18										-
- - - - 5 -																			
- 		Medium dense, tan medium to fine SAND, little Silt. (SM)			SS	2	17	11 5 6 7	11			•							-
- - - - - 10 -																			-
		Medium dense, grayish brown medium to fine SAND, little Silt. (SM)			SS	3	15	4 5 5 6	10										
																			-
- 15 - - 		Loose, brown medium to fine SAND, little Silt. (SM)			SS	4	10	3 3 6 6	9										
 		Boring terminated at 17 feet. No refusal.																	-
- 20 -		er: Seaboard Drilling Inc Springfield, MA; Supervisor: Type: Mobile B-53 Truck Rig; Hammer: Safety Hammer				SA, 2"	Split	Spoon	Samp	bler		Fiel	ld Van	e Tes	t	ssion T	Remo	olded	

BOREHOLE LOG

B-8

PROJECT No. **195150603 Springfield Water and Sewer Commission** LOCATION 1883 Liberty Street, Springfield, MA EXPLORATION No. B-8

EXPLORATION DATE10/15/2018 to 10/15/2018			TEI	R LEVI	EL -	8.5						DAT	UM	_				
(#)		F	ير		SA	MPL	ES					draine			trengt		f	
DEPTH (ft) ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyr	ter C	onten	t & A	on Te	st, blo	ows/fo	oot .	4
						in.				l		d Pen 20 3						80
0	12-inches Asphalt pavement.																	
	Dense, gray/brown coarse to fine SAND, trace Silt, little coarse to fine Gravel.			SS	1	10	21 25 15 12	40						•				
- - - - 5 -																		
`	No recovery.			SS	2	0	14 13 9 8	22				•						
-	Medium dense, brown fine SAND and SILT, trace dark brown Organics.		⊋	SS	3	22	3 2 1 2	3		•								
0 -	Very loose, brown fine SAND and SILT. (SM)			SS	4	13	1 1 2 2	3		•								
5-	Loose, brown medium to fine SAND, some to little Silt, trace fine Gravel. (SM)			SS	5	13	3 4 3 5	7		•								
	Boring terminated at 17 feet. No refusal.																	

B-9

X Pocket Penetrometer / Torvane

CLIENT Springfield Water and Sewer Commission

LOCATION Dwight Street and Liberty Street, Springfield, MA

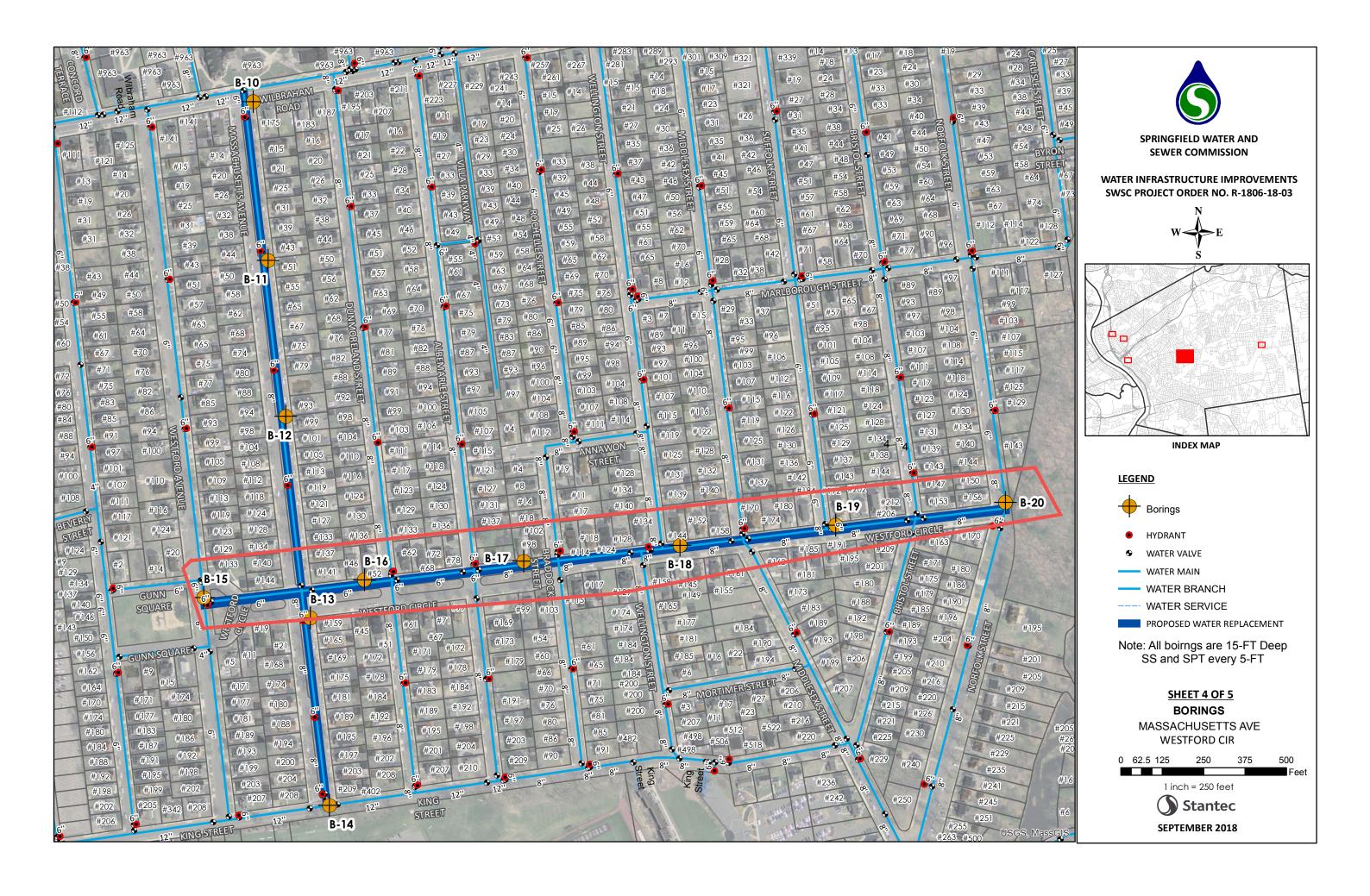
EXPLORATION DATE 10/15/2018 to 10/15/2018 WATER LEVEL 10

DATUM 195150603

EXPLORATION No. 195150603

EXPLORATION DATE DATUM

WATER LEVEL DATUM SAMPLES Undrained Shear Strength - tsf ELEVATION (ft) STRATA PLOT **WATER LEVEL** PID Reading (PPM) SPT N-Value RECOVERY DEPTH (NUMBER lows / MATERIAL DESCRIPTION TYPE W_{l} Water Content & Atterberg Limits SPT Dynamic Penetration Test, blows/foot Standard Penetration Test, blows/foot 20 30 40 50 60 80 90 0 13-inches Asphalt pavement. Medium dense, reddish brown coarse to fine SAND, 24 little Silt, some coarse to fine Gravel. 14 12 28 1 14 13 5 No recovery. 2 2 2 0 4 2 2 Red brick. 6 Very dense, reddish brown fine SAND, little Silt. 20 SS 3 50 37 ∇ - 10 Medium dense, brown medium to fine SAND, trace 4 Silt, trace Brick. 5 SS 4 10 5 6 15 Medium dense, brown coarse to fine SAND, trace Silt. 5 5 8 12 8 Boring terminated at 17 feet. No refusal. 20 Driller: Seaboard Drilling Inc.- Springfield, MA; Supervisor: Brian Foley △ Unconfined Compression Test Rig Type: Mobile B-53 Truck Rig; Hammer: Safety Hammer; 4.25" diam. HSA, 2" Split Spoon Sampler ☐ Field Vane Test Remolded



B-15

CLIENT	Springfield Water and Sewer Commission	PROJECT No.	195150603
LOCATION _	Westford Circle and Westford Avenue, Springfield, MA	EXPLORATION	No. B-15
EXPLORATION	N DATE10/18/2018 to 10/18/2018 WATER LEVEL4	DATUM	

	Œ		TC	□□		SA	AMPL	ES .					Iraine 1		ar St 2	rength	n - tsf 3		1
DEPIH (II)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyı	ter C	onten	t & At	terbe	rg Lim st, blov st, blov	nits ws/foc	ot :	
o							in.							30 4					30
Ţ		Medium dense, dark brown medium to fine SAND		1				3											
4		and SILT, trace Organics. Medium dense, tan coarse to fine SAND, trace Silt.	n_4	1	SS	1	18	5 7	12			•							:::
4		inedian dense, tan coarse to fine SAND, trace Sitt.						7											: : : : : :
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4		M. F. J. J. J. G. GAND Full		<u>.</u>		-										: : : : :			
4		Medium dense, tan/gray medium to fine SAND, little Silt, trace coarse Sand.						7											:::
-		3.3, 2.4.3 2.4.3			SS	2	15	7 9	16			•							:::
1								8											
1																			
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				:															: : :
4																			: : :
-																			
1		Medium dense, tan/gray medium to fine SAND, trace				-													
1		Silt, trace Gravel.						3 4											:::
1					SS	3	20	6	10) :::::							
]				:				7											
1																			:::
4																			: : : : : :
1																			
-																			
1																			:::
1		Medium dense, tan/gray medium to fine SAND, trace						5											:::
		Silt, trace Gravel.			SS	4	18	7	15										
1								8 10					:::::					:::::	
+		Boring terminated at 17 feet. No refusal.		-			\vdash												: : : : : :
-		Borning terminated at 17 feet. No refusal.																	
1														::::					
1																			: : :
]																			
							1				::::	::::	1::::	::::	::::	: : : :	::::	::::	1:::

B-16

CLIENT	Springfie	eld Water and Sewer Commissi	on		 PROJECT No.	195	150603
OCATION _	52 Westf	ord Circle, Springfield, MA			 EXPLORATION	No.	B-16
EVDI OD ATIO	NDATE	10/17/2018 to 10/17/2018	WATED LEVEL	11	DATIM		

EXPLORA	TION DATE	10/17/2018 to 10/17/2018	WA	TEI	R LEVI	EL -	11						DAT	UM	_				
- F			 -	یر		SA	MPL	.ES				Und	Iraine	d She	ear S	trengtl	n - tsf		
DEPTH (II)		MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyı	namic	Pene	t & At	n Te	erg Lin st, blo est, blo	nits ws/foo	ot ·	4
							in.				ı								3 0 9
0	some Silt, t	ense, dark brown medium to fine SAND, race Organics. ense, brown medium to fine SAND, little			SS	1	9	2 5 5	10										
-	Silt. (SM)	ase, brown medium to fine SAND, fittle						7											
- - 5 -																			
	Medium de (SP)	ense, tan medium to fine SAND, trace Silt.			SS	2	16	5 7 8 11	15			•							
0 –	Medium de (SP)	ense, tan medium to fine SAND, trace Silt.			SS	3	20	5	13										
-				-	33	3	20	7 10	13										
- - -																			
- - 5 -																			
	Medium de trace Grave	nse, tan medium to fine SAND, trace Silt, el. (SP)			SS	4	22	3 7 8 10	15			•							
	Boring tern	ninated at 17 feet. No refusal.																	
-																			
1												::::		: : : :	:::		: : : :		

B-17

✗ Pocket Penetrometer / Torvane

CLIENT	Springfic	eld Water and Sewer Commissi	ion		 PROJECT No.	195	<u>150603</u>
LOCATION _	98 West	ford Circle, Springfield, MA			 EXPLORATION	No.	B-17
EXPLODATE.	NID ATTE	10/17/2019 to 10/17/2019	WATER LEVEL	10	D. A. TITLIN A		

	ORATI	ION DATE _	10/17/2018 to 10/17/20)18	WA	TER	LEVE	EL -	10				_		DAT	UM	_				_
á	£				Ļ	ш		SA	MPL	ES				Und	Irained			rength			
Ĭ	ELEVATION (ft)	Ŋ	MATERIAL DESCRIPTION		STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyr	iter Co	Pene	t & At	n Te	rg Lim st, blov st, blo	iits ws/foo	ot 7	4 // ⊗— *
									in.				1	0 2	20 3	0 4	10	50 6	60 7	0 8	80 9
-			nse, dark brown medium to fine ace Organics.	SAND	H J		SS	1	4	2 8 7 6	15										
- - - -			nse, grayish brown coarse to fin ace fine Gravel. (SP)	e SAND,			SS	2	14	4 4 7 5	11			•							
) - - - -		Medium der trace Gravel	nse, reddish brown fine SAND a l. (SM)	and SILT,		Σ	SS	3	10	7 8 11 12	19										
-																					
- - -		Medium der Clay. (ML)	nse, reddish brown SANDY SII	LT, trace			SS	4	10	5 6 6 5	12			•							
-		Boring term	inated at 17 feet. No refusal.																		

B-18

✗ Pocket Penetrometer / Torvane

CLIENT	Springfield Water and Sewer Commission	PROJECT No.	1951	50603
LOCATION _	144 Westford Circle, Springfield, MA	EXPLORATION	No.	B-18
	10/17/2019 to 10/17/2019 WARD VEY Not observed			

ЕУ	KPLORAT	ION DATE10/17/2018 to 10/17/2018	WA	TEI	R LEVE	EL -	Not o	bserve	d				DAT	TUM						
	(ft)		TC	П		SA	MPL	ES				Und	draine		ear Str	ength	- tsf			
DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyr	namio	Pen	it & Af	2 	t, blov	nits ws/foo	ot 7	# 	% L
							in.				l				40 5				80 9	90
- 0 - -		Loose, dark brown medium to fine SAND, some Silt,trace Organics.			aa		1.4	1 2												
		Loose, brown coarse to fine SAND, some Silt. (SM)			SS	1	14	4 4	6											
																				_
- - 5 -		M.F. J. J. J. J. G. GAND																		
		Medium dense, brown medium to fine SAND, trace Silt. (SP) Medium dense, reddish brown fine SAND and SILT.		· · ·	SS	2	16	6 11 16	27											_
		(SM)		-		-		16												_
																				_
 -																				_
- 10 - -		Medium dense, reddish brown SILT and fine SAND. (ML)						9 10												_
					SS	3	5	10 14	20				•							_
																				_
																				_
- - 15 –		Medium dense, brown/reddish brown SILT. (ML)																		
		Medium dense, brown/reddish brown St. 1. (ML)			SS	4	18	20 11 15	26											_
-		Boring terminated at 17 feet. No refusal.						14												
-]																				
-]																				
- 20 -	w- 100		D :										::::		<u> </u>					L
		er: Seaboard Drilling Inc Springfield, MA; Supervisor: Type: Mobile B-53 Truck Rig; Hammer: Safety Hammer				A, 2"	Split	Spoon	Samp	oler			confin d Van		ompres st		Test Rem	olded		

B-19

X Pocket Penetrometer / Torvane

CLIENT Springfield Water and Sewer Commission PROJECT No. 195150603

LOCATION 192 Westford Circle, Springfield, MA

EXPLORATION DATE 10/17/2018 to 10/17/2018

WATER LEVEL Not encountered PATLINA

ЕХ	KPLORAT	ION DATE10/17/2018 to 10/17/2	018	WA	TER	R LEVE	EL -	Not o	encoun	tered				DAT	UM					
	£			 -	_		SA	MPL	ES				Unc	Irained	d She	ar Str	ength	- tsf		
DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION		STRATA PLOT	WATER LEVEL	TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value	PID Reading (PPM)	Dyr	namic	1 ontent Pene	t & Atternatio	n Test	t, blov	its vs/foo		⊢ –1¯
								in.				l			0 4			0 7		90
- 0 -		3-inches Asphalt pavement.		·= · _:										T::::						
LJ		Coarse gravel road base.		19.13 19.13 19.13												:::::				::::E
		Medium dense, brown medium to fine SAN Silt, trace Gravel. (SM)	ND, little			SS	1	8	14 8 5 9	13			•							-
- - 5 -																				
 		Loose, tan medium to fine SAND, trace Si coarse Sand. (SP)	lt, trace			SS	2	17	2 3 6 6	9										-
																				-
- 10 - - 		Dense, tan coarse to fine SAND, trace Silt.	(SP)			SS	3	8	12 16 15 17	31					•					-
- - - - -																				-
- 15 - - 		Dense, tan medium to fine SAND, trace Si Dense, orange medium to fine SAND, little (SM)				SS	4	14	4 11 21 23	32					•					-
 		Boring terminated at 17 feet. No refusal.																		-
– 20 –		er: Seaboard Drilling Inc Springfield, MA; S Type: Mobile B-53 Truck Rig; Hammer: Safe					A, 2"	Split	Spoon	Samp	ler		Field	onfine d Vane	e Tes	t		Rem	olded	

B-20

✗ Pocket Penetrometer / Torvane

CLIENT	Springfie	eld Water and Sewer Commiss	ion		 PROJECT No.	195	150603
LOCATION _	Westfor	d Circle and Norfolk Street, S	pringfield, MA		 EXPLORATION	No.	B-20
EVDI OD ATIO	NIDATE	10/18/2018 to 10/18/2018	WATER LEVEL	Not encountered	DATINA		

EX	PLORAT	ION DATE10/18/2018 to 10/18/2018	WA	TEI	R LEVE	EL -	Not e	ncount	ered		_]	DAT	UM					
	(£)		SAMPLES									Und	rained		ar St 2	rength			4
DEPIH (II)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT WATER LEVEL TYPE NUMBER RECOVERY SPT blows / 6" SPT N-Value PID Reading (PPM)				Dyr	namic	Pene	& At	terbe	rg Lim	its vs/foc	t r	₩ ' ★				
							in.				l	11ua1u 0 2				50 6			80 9
0		Loose, brown medium to fine SAND, little Silt, trace		1				1											
-		Organics. Loose, brownish tan medium to fine SAND, little	/ :.:. 		SS	1	16	2 2	4		•								
-		Silt, trace fine Gravel. (SM)						2											
				<u>:</u>															
4																			
-																			
-																			
1																			
· -		Medium dense, grayish tan medium to fine SAND,						5											
4		trace Silt. (SP)			SS	2	20	7 8	15			•					:::::		::::
1								9											
-																			
1																			
4																			
-																			
-																			
) –		Medium dense, grayish tan medium to fine SAND,						8							::::				
]		trace Silt. (SP)			SS	3	20	9	18										
4						5		9 8	10			::::							
_				:		_													
1																			
1																			
1																			
4																			
;-		Medium dense, tan fine SAND, little Silt, little		-															
1		medium Sand. Iron staining. Moist at bottom. (SM)						5 8											
1					SS	4	22	9	17			•							
1			:					11											
1		Boring terminated at 17 feet. No refusal.																	
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1																			
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APPENDIX B SWSC Guidelines and Policies

SPRINGFIELD WATER AND SEWER COMMISSION



GUIDELINES AND POLICIES

Version 4 – November 1, 2020

William E. Leonard, Commissioner Vanessa Otero, Commissioner Daniel Rodriguez, Commissioner

Guidelines and Policies

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Guidelines and Policies

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 $4.5 \ge 4$ -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



- 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.



- 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



- 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



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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



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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



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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 accourdance 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.



- 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 \geq 45-degrees.



Springfield Water and Sewer Commission Guidelines and Policies



Guidelines and Policies

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



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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



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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.



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- (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



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- 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)



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CHAPTER 3 DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in these Guidelines and Policies shall be as follows:

- 1. <u>Abutter</u> means one who holds titles to real property within the limits of a Sewer Improvement Area and his/her successors in title.
- 2. <u>Additional Meter</u> 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. <u>Applicant</u> shall mean any Owner or duly authorized Owner's agent applying for any services provided by the Commission.
- 4. <u>Application Fee</u> 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. <u>Application Fee to Review Crossing Commission Property</u> shall mean the fee charged to review plans, specifications, and easements and inspect the crossing of Commission owned property.
- 6. <u>Appurtenances</u> 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. <u>As-Built Plan Fee</u> 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. <u>Authorized Field Representative</u> 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. <u>Automatic Meter Reading Device (AMR)</u> shall mean a device(s) used for reading a water meter without having to enter a premise.
- 10. <u>Auxiliary Meter</u> 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



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the Owner and are subject to Commission inspection in accordance with the Commission's Rules and Regulations.

- 11. <u>Backflow Prevention Device (BFP)</u> shall mean an approved mechanical device designed to prevent Backflow.
- 12. <u>Backflow</u> 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. <u>Best Management Practices (BMP)</u> 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. <u>Building Drain</u> 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. <u>Building Sewer</u> 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. <u>Categorical Industrial User</u> shall refer to industrial users subjected to EPA categorical pretreatment standards.
- 18. <u>Charges</u> 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. <u>Combined Service</u> shall mean a service pipe that is used to provide both Water Service and private fire protection service.
- 21. <u>Combined Sewer</u> means a Sewer receiving and conveying both sanitary Wastewater and surface runoff from storms.



- 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. <u>Commission Approved Contractor Application Renewal Fee</u> 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. <u>Commission Approved Contractor</u> 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. <u>Commission Construction Crew</u> 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. <u>Commission</u> 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



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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. <u>Commissioners</u> refers to a board of three appointed members who shall govern the Commission as set forth in MGL 40-N.
- 29. <u>Critical Valves</u> 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. <u>Customer</u> 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. <u>Customer Water Service</u> 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. <u>Developed Property</u> means property that generates wastewater.
- 34. <u>Discontinuance</u> 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. <u>Domestic Wastewater</u> 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. <u>Drain</u> For the meaning of "Drain," see "Storm Drain."
- 37. <u>Dry Industry</u> 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



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for cleaning, or for which total annual wastewater production is less than one hundred thousand (100,000) cubic feet.

- 38. <u>Easement</u> shall mean an acquired legal right for the specific use of land owned and maintained by others, whether recorded or by prescription.
- 39. <u>EPA</u> means United States Environmental Protection Agency.
- 40. <u>Executive Director</u> means the Executive Director of the Commission or his/her Authorized Field Representatives.
- 41. <u>Facilities</u> 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. <u>Fire Department Permit to shut off sprinkler system</u> 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. <u>Fire Flow Test</u> 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. <u>Fire Service Pipe</u> 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. <u>Guidelines and Policies</u> 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. <u>Hydrant</u> 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. <u>Industrial</u> 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. <u>Industrial User</u> means an Industry discharging Industrial Wastewater to a Public Sewer.



- 49. <u>Industrial Wastewater</u> means the liquid Wastes from industrial manufacturing processes, laboratories, trades or businesses which predominate as distinct from Domestic Wastewaters.
- 50. <u>Industry</u> 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. <u>Institutional</u> 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. <u>Interceptor Sewer</u> 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. <u>Leak</u> 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. <u>License Agreement</u> 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. <u>Lot</u> means real property, which is described by deed, or filed subdivision plan, as a single entity and cannot be the further subdivided.
- 56. <u>Main Extension Application</u> 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. <u>Master Meter</u> 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. <u>Material Specifications</u> 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.



- 61. <u>Meter</u> 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. <u>Parcel</u> means real property consisting of one (1) Lot, or two (2) or more contiguous Lots, under one (1) ownership.
- 66. <u>Person(s)</u> 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. <u>Plumber</u> shall mean a person with a current and valid license as a plumber by the Commonwealth of Massachusetts.
- 68. <u>Potable Water</u> shall mean water fit for human consumption in conformance with the regulations of the MDEP.
- 69. <u>Premise / Property</u> 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. <u>Private Drain</u> means any Drain located on private property and not under the full care and control of the Commission or the City of Springfield.
- 71. <u>Private Fire Protection</u> 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. <u>Private Hydrant</u> shall mean a hydrant installed and maintained by an Owner for the purpose of private fire protection/suppression at a particular Premise.



- 73. <u>Private Sewer</u> 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. <u>Public Drain</u> 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. <u>Public Fire Protection</u> 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. <u>Public Sewer</u> 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. <u>Public Water Main</u> 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. <u>Public Water Supply</u> shall mean the water and/or ground water that is provided to the public for human consumption.
- 80. <u>Public Water System</u> shall mean a system for the provision to the public of piped water for human consumption. The Commission is a Public Water System.
- 81. <u>Remote Meter Device</u> 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.



- 83. <u>Residential</u> 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. <u>Sanitary Sewer</u> means a Sewer, which carries domestic, and/or Industrial Wastewaters and to which surface runoff from storms and groundwater is not intentionally admitted.
- 85. <u>Service Application</u> 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. <u>Service Area</u> 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. <u>Sewer Facilities</u> 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. <u>Shut Off</u> shall mean to temporarily stop Water Service or to terminate Water Service, in accordance with the Commission's Rules and Regulations.
- 90. <u>Storm Drain</u> 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. <u>Tapping Main Charge (Basic)</u> 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.



- 93. <u>Tapping Main Charge (Complete)</u> 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. <u>Turn-On</u> 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. <u>Undeveloped Property</u> means property that is void of any buildings, does not have Wastewater facilities, and does not require a connection to the Public Sewer.
- 96. <u>User</u> shall mean a Person who receives water and/or Sewer service(s) from the Commission within the Commission's Service Area.
- 97. <u>Wastes</u> mean substances in liquid, solid or gaseous form that can be carried in water.
- 98. <u>Wastewater</u> 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. <u>Wastewater Works or Wastewater Treatment Works</u> 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. <u>Water and Sewer Service</u> 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. <u>Water Facilities</u> will mean Meters, Backflow Prevention Devices, water valves, water mains, Water Service Pipes, Fire Service Pipes, and water hydrants.



- 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. <u>Water Service Connection</u> 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. <u>Water Service Pipe</u> 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. <u>Water Service</u> 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. <u>Water Users</u> or <u>Water Consumers</u> 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. <u>Watershed lands, Reservoir lands, Roads and Trails, and Waterways</u> 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;



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- (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.



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- 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.



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- 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

- 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, <u>Automobile Public Liability Insurance</u> 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:



- (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.



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- (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.



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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;
- (1) 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;



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- (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;



- (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;



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- 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
- 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:



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- 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.

(1) 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.



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- 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;



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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) 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 asbuilt 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:



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- 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.



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- 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.



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- 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



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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.



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- 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



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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



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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.



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Section 4.4 Inspections for 1-inch to 2-inch Water Service (by Installers)

4.4.1 Installer Responsibilities at the Installation

- 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.



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- (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:



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- (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.



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(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 treebelt.
- 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.



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- 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.



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- (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,



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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.



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- (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;



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(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.



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- (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.



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- (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.



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- 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.



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- 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.



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- (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



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- 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.

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- (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:



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- (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.
 - <u>Caution:</u> 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.



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- *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 counterclockwise (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.



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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.



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- 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.



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- (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,



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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.



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- (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	Deflection Angle	Maximum Allowable
(Diameter in inches)	(in degrees)	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).



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- (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.



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- 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.



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(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 -30° F (-34° 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



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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.
 - (i) 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.



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- (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, 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.



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- (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



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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	Deflection Angle
(in inches)	(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



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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



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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.



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- 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

 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.



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- 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. Retorque 15-minutes after to ensure the BJC is properly tightened.

6.2.12 Friction Clamps

- 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) ³/₄-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
 - ³/₄-inch and larger bolts shall be tightened to 75-foot-pounds.
 - (b) Fabricated steel harnesses shall be tightened according to the manufacturer's recommendations.



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- 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



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- 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) ³/₄-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) 3/4-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.



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- (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.



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- (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

- 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.



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- (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

- 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 cutin. 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.



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- (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.



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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.



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- 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.



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- 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.



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- 3. Slide the gland, Grip Ring, and M.J. gasket on to pipe end. <u>Make sure the tapered</u> 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.



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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.



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- 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.



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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 exceeding 12-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.



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(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.



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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



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(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



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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



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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.



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- 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.



- 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



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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



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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)					1	NOM	INAL	PIPE	DIA	МЕТЬ	ER (in	inche	es)				
	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 ³/₄-inch with a brass bushing. This side of the tee shall be used for water quality sampling.
 - (g) A ³/₄-inch nip shall be used to connect a ³/₄-inch by ¹/₂-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.



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- (i) On the other side of the tee, which shall be used for flushing, it shall be either bushed down to ³/₄-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.
- (1) 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.



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- (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.



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- 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.



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	1-1/2 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



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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.



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- 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

	Approximate Length of Water Service							
Diameter of Copper Tube Pipe	30FT.	60FT.	90FT.	120FT.				
3/4**	1 oz.	1 ½ oz.	2 ¼ oz.	3 oz.				
1"	1 ½ oz.	2 ½ oz.	4 oz.	5 oz.				
1 1/4"	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.



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- 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. <u>IMPORTANT REMINDER</u>: 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 preflushed with chlorine solution (household bleach) and main water, and there will be no water in the trench at the level of the ferrule connection.



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- 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.



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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

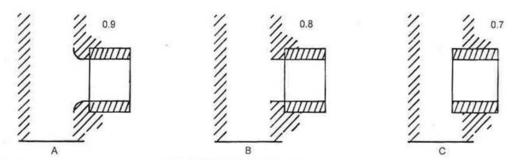
- 1. In order to obtain valuable flow test data, flow and pressure readings need to be taken accurately and all necessary data recorded. Calibrated gauges are required and shall be checked regularly and recalibrated as necessary. Preprinted Fire Flow Test Form(s), attached in Section 15.1.9 of these 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":
 - $Q-20 = Q*((S-20)^{5.4}/(S-R)^{5.4})$
 - 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.



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- (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 ($\frac{3}{4}$ ") – NO LONGER ALLOWED, one-inch (1"), one-and-one-half-inch ($1-\frac{1}{2}$ ") and two-inch (2") copper tube water service pipes. Sizes $\frac{3}{4}$ -inch and $1-\frac{1}{4}$ -inch services have been eliminated and replaced with standard sizes 1-inch, $1-\frac{1}{2}$ -inch, and 2-inch. On occasion and as directed by the Commission, the eliminated $\frac{3}{4}$ and $1-\frac{1}{4}$ -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**



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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.



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- 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.
- 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.



- 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 90° 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 ³/₄ 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 90° Angle: 1-inch Quick joint x ³/₄ 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.
 - <u>Note</u>: This is a Curb Stop with brass handle used as an inside cellar meter valve.



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- 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.



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- 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.



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- 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 ³/₄-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.
 - <u>Note</u>: 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 90° 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 ³/₄ 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 90° Angle: 1-inch Quick joint x ³/₄ 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.



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- (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



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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 ³/₄-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.



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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:
- 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 ³/₄-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



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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.



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- 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



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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 ³/₄-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 90° 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.



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- 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.



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- (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 ³/₄-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.



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- 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.



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- 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.



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- 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.



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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.



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- 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.



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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



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installed to assist in securing proper alignment and adequate compaction of the base and surface courses.



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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,



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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



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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



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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.



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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



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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



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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



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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.



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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,



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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



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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

SEWER MANHOLE FRAME AND COVER INSTALLED



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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;



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- 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.

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- 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:



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- (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.



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- 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.



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CHAPTER 11 <u>SEWER MAINS AND APPURTENANCES</u>

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



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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.



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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

- 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.



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- 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.



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- (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



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maintained below pipe bedding and foundation of the trench to provide a stable trench bottom. Use, as appropriate, sump pumps, well points, deep wells, geofabrics, 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.



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- 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).



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- 2. Pipe Bedding Material shall meet Class I ASTM D2321 embedment material that shall be ³/₄-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.



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- (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%.



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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.



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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,



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- 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.



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(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 ³/₄-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-inplace 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.



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- 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.



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- (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.



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- 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.



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- (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.



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- 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.



Guidelines and Policies

CHAPTER 13 <u>SEWER PUMP STATIONS</u>

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.



Guidelines and Policies

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 Precast 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.



Guidelines and Policies

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.



Guidelines and Policies

- 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.



Guidelines and Policies

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.



Guidelines and Policies

- 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.



Guidelines and Policies

- 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

- 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).



Guidelines and Policies

14.1.5 Terminal Flushing Structure

- 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.



Guidelines and Policies

- 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.



Guidelines and Policies

14.2.4 LPSS Service Lateral Curb Stop and Check Valve Assembly

 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.



Springfield Water and Sewer Commission Guidelines and Policies

CHAPTER 15 FORMS



Guidelines and Policies

15.1.1 Commission Approved Contractor - Application Form

1.	Date Application Submitted:			
2.	Type of Work to be Performed by Applicant: \square Water \square Sewer \square 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: \$\Begin{array}{cccccccccccccccccccccccccccccccccccc			
	Renewal Fee: \$\Begin{align*} \text{\$100.00} & \text{Received by:} \text{\$\text{\$\text{\text{\text{\text{\text{\text{\text{\text{Received by:}}}}}}}			
4.	Applicant's Company Name:			
	Owner:			
	Business Address:			
	Office Contact:			
	Telephone Number:			
	Fax Number:			
	Email Address:			
5.	Applicant's Responsible Supervisors:			
	Name <u>Cellular Phone Number</u>			



Guidelines and Policies

6. Please provide a narrative description of the following:

}.	Briefly, discuss the Applicant's procedure and equipment for pressure testing was and sewer mains that indicate the Applicant's company has the proper equipment a
	method of work to successfully pressure test said mains and services in proje Hiring of a subcontractor to perform the pressure test is allowed provided spec information about the subcontractor, such as Name, Company, Company's c business, address, phone number, name of responsible supervisor is submitted.
	method of work to successfully pressure test said mains and services in proje Hiring of a subcontractor to perform the pressure test is allowed provided spec information about the subcontractor, such as Name, Company, Company's c
	method of work to successfully pressure test said mains and services in proje Hiring of a subcontractor to perform the pressure test is allowed provided spec information about the subcontractor, such as Name, Company, Company's c
	method of work to successfully pressure test said mains and services in proje Hiring of a subcontractor to perform the pressure test is allowed provided spec information about the subcontractor, such as Name, Company, Company's c



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C .	and services that method of work of a subcontracted about the subcontracted ab	the Applicant's procedure and equipment for disinfecting water at indicate the Applicant's company has the proper equipme to successfully disinfect said mains and services in projects. For to perform the disinfecting is allowed provided specific informatractor, such as Name, Company, Company's core business, as name of responsible supervisor is submitted. (Required for water	nt and Hiring mation ddress,		
D.		ble licenses (MA Master or Journeyman Plumber or Drinking ribution 2 or higher License)	Water		
E.	Proof of Required Bonding				
	Bonding Company				
	Telephone Number				
	Contact Person				
		If the Applicant does not have MA Master/Journeyman Pl License or a Drinking Water Operator – Distribution 2 or License the Bond Amount shall be \$10,000.00			



Guidelines and Policies

		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 Require	ed 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.	
C	0' 1.1.		

G. Sign and date the form titled "Indemnity" attached in the Form Section of these Guidelines and Policies.



Guidelines and Policies

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:

١.	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:



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:



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:



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.

	(PRINT FULL NAMI	Ξ)	
Contractor Signature:		Date	

Contractor Name:



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.



Guidelines and Policies

LICENSE AGREEMENT SANITARY SEWER MAIN EXTENSION AND/OR

WATER MAIN EXTENSION

Revised October 3,2007

	day of2008 by and between to as a AND SEWER COMMISSION (hereinafter referred to as a	the
"COMMISSION"), a bo	y politic incorporate and political subdivision of the Commonwea s offices at the 250 M St. Ext., Agawam, MA 01001, and	
of Massachuseus, with h	offices at the 250 W St. Ext., Agawam, WA 01001, and	
(herein after referred to a	s "OWNER").	
WHEREAS, the Owner following;	has applied to the Commission for permission to construct to	the
-	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 ofinch diameter Sanitary Sewer Main,	
and associated structures	as shown on the Plan and Profile entitled:	
		٠٠ <u>,</u>
Scale: 1 inch = feet	Date:, 200_, revision,	
Prepared by:		2
	said Plan and Profile being on file with the Commission.	
WHEREAS, the Owner following,	has applied to the Commission for permission to construct to	the
	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 ofinch 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:		<u>.</u>
	said Plan and Profile being on file with the Commission.	



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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.



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 const	ruction period until all mains approved), in the amount of dollars.
Bond No.	- Company.
(Bond Num	er & Surety Company)
Descr	ption of Surety
Maintenance Bond (after construction period one-year minimum), in the amount of	rom time of all main approvals until end of warranty period –
	dollars.
± (Bond Num	per & Surety Company)

NOTE: Originals of sureties shall be attached as part of this License Agreement for the Commission.



- 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.



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 Print Name and Title Print Date Print Address Print Telephone Number	Executive Director Signature				
Print Name and Title	Print Name				
Print Date	Print Date				
Print Address	250 M Street Extension, Agawam, MA 01001 Print Address				
Print Telephone Number	413-787-6256 Print Telephone Number				



Springfield Water and Sewer Commission Guidelines and Policies

15.1.5 Inspection Form

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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.	Minimum Time	Length for Min. Time	Time for Various Length		Specifi	cation Tim	e for Lengt	h (L) Show	n (in m	in:sec)	
(in.)	(min:sec)	(ft.)	(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

_	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
<u>Passed</u> (actual time > allowable time)	<u>Failed</u> (allowable time > actual time)





Guidelines and Policies

15.1.7 Standard Method for Sewer Manhole Vacuum Test Form

Location		 	
Test Date			
Installed By			
Test Performed B	у		
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.

				Diar	neter (in Inc	ches)			
Depth	30	33	36	42	48	54	60	66	72
(in Feet)				Tir	ne (in secon	ds)			
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

<u>Passed</u> (actual time > allowable time) _____ <u>Failed</u> (allowable time > actual time) ____



Guidelines and Policies

15.1.8 Application for Crossing Water Transmission Mains

Applicant Name:	Date:
Celephone Number: Cellular Number: Cellular Name: Celephone Number: Celephone Number: Cellular Number: Cellular Number: Cellular Number:	
Telephone Number:	Fax Number:
Cellular Number:	Other Number:
Project Engineer Name:	
Address:	
	Fax Number:
	Other Number:
Address:	
Type of Crossing:	
	15.25



Attachments:	Yes		<u>No</u>
Signed/Stamped Plans:			
Location Maps:			
Project Description:			
Material Specifications:			
Permitting Requirements:			
Other:			
By Commission:			
Reviewer's Name:		Date:	
	<u>Y</u>	es	<u>No</u>
Crossing less than 18-inches below Grade	e (\$1,500)		
Crossing greater than 18-inches below Gr	rade (\$5000)		
Crossing Under Transmission Main (\$10,	.000)		
Reviewer's Comments:			



ast Modified: 04/11/2024 at 12:57PM E

Springfield Water and Sewer Commission

Guidelines and Policies

15.1.9 Fire Flow Test Form

STATIC & RESIDUAL H	YDRANT	:			D	ATE		
HYD#: TYPE:		N	IAIN SIZ	E:		IME		
STREET NAME					†	EMP		
LOCATION						VEATHER		
PRESSURE	GAUGI	E	OBSER	VER		WO #		
STATIC					_			
RESIDUAL					-			
FLOW HYDRANT(S):								
HYDRANT NUMBER, TYPE STREET NAME, AND LOCATION		GAUGE NUMBER	NOZZLE SIZE IN INCHES	NUMBER OF NOZZLES	NOZZLE COEFFICIENT (0.9, 0.8, OR 0.7)	READING	FLOW IN GPMS	OBSERVER
FLOW DURING TO AVAILABLE @ 2 REMARKS:	0 PSI		_ in GPM in GP	M T	IME FLOWEI	ED	in ga	



15.257

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



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



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



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	<u>2-3/8-inch</u>	2-7/16-inch	<u>2-1/2-inch</u>	2-9/16-inch	<u>2-5/8-inch</u>	4-1/2-inch
Pitot Gauge	0.075	0.4075	0.5	0.5005	0.005	4.5
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



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



Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	2-1/2-inch	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
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					



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				



Diameter of	0.0/0.1	0.7/10.1	0.4/0.1	0.0/40 11	0.5/0.1	4.4/0.11
Nozzle	2-3/8-inch	2-7/16-inch	<u>2-1/2-inch</u>	2-9/16-inch	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
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				



Diameter of Nozzle	<u>2-3/8-inch</u>	2-7/16-inch	2-1/2-inch	2-9/16-inch	<u>2-5/8-inch</u>	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
\mathbf{C}	= 0.7					



15.1.13 Values for Pressures 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



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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.



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- 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.



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- 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



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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.



- (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



APPENDIX C SWSC Material Specifications

SPRINGFIELD WATER AND SEWER COMMISSION



MATERIAL SPECIFICATIONS

Version 4 – November 1, 2020

William E. Leonard, Commissioner Vanessa Otero, Commissioner Daniel Rodriguez, Commissioner

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.



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)



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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.



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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.



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- 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 A21.15/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.



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- 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/ft³ (35 to 48 kg/m³) 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/in² (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-ft²-°F (0.020 to 0.026 W/m-°C), and
- 9. The service range shall be -49° F to 185° F (-45° C to 85° 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 -49° F (-45° C),
- 13. The minimum installation temperature shall be -30° F (-34° 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).



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- 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 prefabricated 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



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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,



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- (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 -49° F to 185° 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



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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.



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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,



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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 Specification.



- 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



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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.



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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



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- (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



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- 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.



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- 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



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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



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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.



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- 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



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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,



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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).



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- 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.



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- 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 orings 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.



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- 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).



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- 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.



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- 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, 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.



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- 2. Corporations may rotate 360 degrees in either direction or rotate ½ turn only and **OPEN LEFT**, counter-clockwise.
- 3. One-inch or Two-inch 90-degree elbows: may be brass 85-5-5, 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 \(\frac{1}{4} \) turn only and \(\frac{\text{OPEN LEFT}}{\text{term}} \), counter-clockwise.
- 6. One-inch and/or Two-inch Nip: may be brass 85-5-5, 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, 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, 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, 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 ½ 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.



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- 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, 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 ½ 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

<u>1-inch</u> <u>2-inch</u>

(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



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- (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.



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- 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:



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- (a) A belled base and have an inside diameter of 5-1/4"
- (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 5-1/4".
 - (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 $5-\frac{1}{4}$ ".
 - (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:



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- (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

(1) 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



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- (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)
- (1) 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)
 - (1) 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,



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- (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



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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),



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- (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 \(\frac{1}{4} \)-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 Oring 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



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"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.



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- 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 <u>ASTM</u> 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

- 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.



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- (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 heavyduty 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 anticorrosion 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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3.11.14Hydrant 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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3.11.17 Vandal 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



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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



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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



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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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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.



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- (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.



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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.



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- 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.
 - (1) 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 ³/₄" 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.



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- 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.,



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- (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



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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



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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:



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- 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.

3.13.10Coupling 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.



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- 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.

3.13.11Coupling 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



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- (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 than 16-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



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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.



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- 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



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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: ³/₄-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,



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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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3.14.11Bent 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: ³/₄-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 ³/₄"SST747 or ³/₄"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: ³/₄-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)
³ / ₄ " Threaded Rod	13/16	2	.122177
1" Threaded Rod	1	2-1/2	.136192



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- 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



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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



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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



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- 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 ³/₄" 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.



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- 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 ³/₄" 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.



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(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)



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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.



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- 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



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- (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 CorTen steel. Tee head bolts made of high strength, low alloy, corrosion resistant, CorTen 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



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(g) P x T min. (psi x T°F):

(1) P x T min. (psi x T°F):

(c) Hardness (Durometer) (Shore A) +/-5:	75
(d) Minimum Tensile Strength (ASTM D142):	700-psi
(e) Compression Set at 158°F (ASTM Method B):	22-hrs. 40% maximum
(f) Pressure Rating max.:	250-psi

- 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, Gs (ROTT):	20-psi

- 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 3/4-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 ³/₄-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



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- 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 anticorrosion 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



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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,



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- 4. SF3300 manufactured by Flexitallic, Ltd, Deer Park, Texas, or
- 5. Equal provided the Flange Gaskets are manufactured as per these specifications.

3.16.10Gasket 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



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- (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:



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- (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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- 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
 - (1) 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.



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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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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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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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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



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 Percent by Weight

Designation	Passing Square Mesh Sieve
½ inch	50 - 85
No. 4	40 - 55
No. 50	8 - 28
No. 200	0 - 10



Material Specifications

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.



Material Specifications

3.20.6 Crushed Stone 3/4-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.



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.



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	Percent by Weight
Designation	Passing Square Mesh Sieve
2 inch	100
1-1/2 inch	70 - 100
³ / ₄ inch	50 - 85
No. 4	30 - 55
No. 50	8 - 24
No. 200	3 - 10



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	Percent by Weight
Designation	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



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.



Material Specifications

3.20.11Non-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.



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.



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 ³/₄-inch
- 4. Concrete shall have clean water free from oils, acid, and organic matter.



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.



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 ³/₄-inch, 1-inch, 1-1/4-inch, 1-1/2-inch, and 2-inch diameter.
 - (a) Please note ³/₄-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) ³/₄-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,



Material Specifications

- (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:



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



Material Specifications

- 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.



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.



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.



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:



Material Specifications

- (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.



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



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 ½ turn only and **OPEN LEFT**, counter-clockwise.
- 9. Curb Stop Valves shall rotate \(\frac{1}{4} \) 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



Material Specifications

- (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	MUELLER
TOOL SIZE	PART NUMBER
3/4"	680600
1"	680601
11/4"	
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.



Material Specifications

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).



Material Specifications

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.
- 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.



Material Specifications

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.



SECTION ITEM SIZE IN # & OUT				NOTES				
	1		FORD	RED HED	MUELLER	MCDONALD	CAMBRIDGE	COMB CORP & CURB STOP CC x Q
4.2.2			FB1000-4-Q-TA-NL	RHSB4382	B25008N	4104BQ 1"	311-A4H4	
	3		FB1000-5-Q-TA-NL	NA	NA	NA	NA	CC x Q
	3	1½"	FB1000-6-Q-TA-NL	RHSB4382 4	B25008N 1½"	4104BQ 1½"	311-А6Н6	CC x Q
	4	2"	FB1000-7-Q-TA-NL	RHSB4382 5	B25008N 2"	4104BQ 2"	311-A7H7	CC x Q
4.2.3	5	1"	B44-444-Q-NL	RHSB4151	B25209N	6100Q 1"	202-Н4Н4	CURB STOP Q x Q
	6	11/4"	B44-555-Q-NL	RHSB4151	NA	6100Q 1 ¹ / ₄ " x 1"	202-H5H5	QxQ
	7	1½"	B44-666-Q-NL	RHSB4151 4	B25209N 1½"	6100Q 1½"	202-Н6Н6	QxQ
	8	2"	B44-777-Q-NL	RHSB4151 5	B25209N 2"	6100Q 2"	202-Н7Н7	QxQ
4.2.4	9	1"	B41-444-Q-NL	RHSB4081	B25172N	6102Q 1"	202-H4F4	CURB STOP FIP x Q
	10	11/4"	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 ³ / ₄ "	B43-342W-Q-NL	NA	B24350N	6100MWQ 1"	NA	STR. METER VALVE Q x SWIVEL
	14	1½ x 1"	B43-454W-Q-NL	NA	B24350N	NA	NA	Q x SWIVEL
	15	1½"	BF43-666W-QNL	NA	B24335N 1½"	6100MWQ 1½"	212-Н6МF6Н	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 ³ / ₄ "	BA43-342W-QNL	NA	B24258N	4602BQ 1 x	210-Н4Т3Н	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



SECTION	ITEM #	SIZE IN & OUT	CATALOG NUMBER					NOTES
NUMBER			FORD	RED HED	MUELLER	MCDONALD	CAMBRIDGE	
4.2.8	21	1"	C44-44-ONL	RED HED RH41212	H15403	4758O 1"	119-H4H4	COUPLING Q
4.2.0	21	1	C44-44-QNL	КП41212	П13403	4/36Q 1	119-114114	x Q
	22	11/4"	C44-55-QNL	RH41213	H15403N	4758Q 11/4"	119-H5H5	QxQ
	23	1½"	C44-66-QNL	RH41214	H15403N 1½"	4758Q 1½"	119-H6H6	QxQ
	24	2"	C44-77-QNL	RH41215	H15403N 2"	4758Q 2"	119-H7H7	QxQ
	21		CTT // QTTE	10111213	1113 1031 (2	1730Q 2	117 11/11/	Q n Q
4.4.9	28	3/4" & 1"	HB34	NA	B-20298	6120B 1"	NA inc. w/ valve	Brass Handle
-	29	11/4"	HH67S	NA	B-20298	6120B 1 ¹ / ₄ "	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
7.7.11	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 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 valve
	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



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- (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.



- 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)



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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.



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- 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



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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.



- 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 ³/₄-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.



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- 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 ³/₄-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.



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- (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 ³/₄-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 ³/₄-inch w/ MTE: T-10 Pro Read Register,



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- (b) 1-inch w/ MTE: T-10 Pro Read Register,
- (c) 5/8-inch by 3/4-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,



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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 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



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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 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.



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(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 ³/₄-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 ³/₄-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;



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 25 ft); length at customer's request				



		LCD Cellular Network equipped register with mounting bracket and housing only with wired remote antenna (15 to
35	universal ****	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 ³/₄-inch: Male Thread Ends (MTE)
 - (b) 1-inch: MTE
- 7. Coupling connections shall be easing 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.



- 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.



- 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.



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- (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	Maximum	Allowable	Minimum allowable Capacity		
Size	Indication of I	nitiai Diai	of Register (In million cubic- feet and million gallons)		
	Cubic Feet	Gallons	Cubic Feet	Gallons	
5/8-inch X ³ / ₄ -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.



- 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 ³/₄-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



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(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



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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.



- (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;



Table 1

24 INCH
24 INCH
24 INCH
24 INCH
24 INCH
24 INCH
24 DIGH
24 INCH
24 INCH
2.11.011
24 INCH
A4 DIGH
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.



- 7. Cellular devices shall include ten (10) years of pre-paid cellular service.
- 8. Coupling connections shall be easing 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.



- 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

- 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.



Material Specifications

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 v8.1 or 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



Material Specifications

- 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, Master Meter Octave and other "Sensus Protocol" Meters
- 15. Warranty: 100% for minimum of 10 years



Material Specifications

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 ³/₄-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.



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- 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.



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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.

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



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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).



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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 pickholes on each opposite side and one (1) 1-1/4-inch diameter penetrating pickhole 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:



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- 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.



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- 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 ½-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 ½-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 approximately 11-1/2-inches in diameter.
- (c) Top lids shall be plastic.
- (d) Top lids shall be approximately 12-1/2-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



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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 5.1.1 and 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 <u>may</u> 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



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- (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,



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- (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,



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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.



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- (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	Actual Outside Minimum Wall		Weight	
Diameter	Diameter	Thickness	in lbs/foot	
in inches	in inches	in inches		
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:



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- (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.



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- 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

(1) 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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(z) 4-inch 45-degree bend:



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(aa)	6-inch 45-degree bend:	
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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



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- (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.



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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.



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- 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



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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



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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



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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



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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.



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- 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.



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- 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 pickholes on each opposite side and one (1) 1-1/4-inch diameter penetrating pickhole 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



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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 ½-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 ½-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:



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- 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.



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- 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
 - (1) 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



Material Specifications

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.



Material Specifications

8.1.2 Submersible Sewage Pumps – Quality Criteria

- 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.



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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.



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- (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 restarting 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.



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- 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 <u>ASTM</u> 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.



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- 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.



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- 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

- 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:



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(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.



Material Specifications

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.



Material Specifications

- 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.



Material Specifications

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:



Material Specifications

- (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 standars, 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.



Material Specifications

- 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.



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 ³/₄-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.



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
 - (i) Top layer of virgin PET printability value of 45 dynes
 - (k) Rated for direct burial
 - (1) Proline part #103123083 or approved equal



Material Specifications

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.



APPENDIX D SWSC Standard Details

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

Standard Detail Drawings

WATER DETAILS

- 1. (W-01.0) UTILITY SEPERATION DETAIL
- 2. (W-02.0) NON-PAVED AREA TRENCH DETAIL
- 3. (W-02.1) TRENCH BACKFILLING-METHOD 1 FOR LUDLOW ROADWAYS
- 4. (W-02.2) TRENCH BACKFILLING-METHOD 2 FOR LUDLOW ROADWAYS
- 5. (W-02.3) TRENCH BACKFILLING-METHOD FOR ARTERIAL STREETS IN SPRINGFIELD
- 6. (W-02.4) TRENCH BACKFILLING-METHOD FOR RESIDENTIAL STREETS IN SPRINGFIELD
- 7. (W-02.5) TEMPORARY TRENCH BACKFILLING METHOD FOR ALL STREETS IN SPRINGFIELD AND LUDLOW EXCEPT ARTERIAL STREETS IN SPRINGFIELD
- 8. (W-02.6) TEMPORARY TRENCH BACKFILLING METHOD FOR ARTERIAL STREETS IN SPRINGFIELD
- 9. (W-03.0) STANDARD AIR VALVE ASSEMBLY DETAIL
- 10. (W-03.1) AIR VALVE ONE PIECE ASSEMBLY DETAIL 1
- 11. (W-03.2) AIR VALVE ONE PIECE ASSEMBLY DETAIL 2
- 12. (W-04.0) END OF MAIN
- 13. (W-04.1) END OF MAIN DETAIL
- 14. (W-05.0) STANDARD TEE INSTALLATION
- 15. (W-05.1) ALTERNATE 1 TEE INSTALLATION
- 16. (W-06.0) REPAIR TO EXISTING WATER MAINS
- 17. (W-06.1) INSTALL VALVE OR FITTING AT A DEAD END OF A WATER MAIN



Standard Detail Drawings

18.	(W-06.2) OR FITTING	CUTTING-INTO EXISTING WATER MAIN TO REPLACE VALVE
19.	(W-06.3) VALVE	CUTTING-INTO EXISTING WATER MAIN WITH BELL FACING
20.	(W-06.4) AWAY FROM	CUTTING-INTO EXISTING WATER MAIN WITH BELL FACING M VALVE
21.	(W-06.5) FOUND	CUTTING-INTO EXISTING WATER MAIN WITH NO BELL
22.	(W-06.6)	CONCRETE THRUST COLLAR
23.	(W-06.7)	SOCKET CLAMP DETAIL
24.	(W-06.8)	THREADED ROD DETAIL AND CONNECTION TO MJ DETAIL
25.	(W-07.0)	STANDARD FIRE HYDRANT ASSEMBLY
26.	(W-07.1)	ALTERNATE 1 FIRE HYDRANT ASSEMBLY
27.	(W-07.2)	ALTERNATE 2 FIRE HYDRANT ASSEMBLY
28.	(W-07.3) BACK)	RELOCATION OF FIRE HYDRANT ASSEMBLY (STRAIGHT
29.	(W-08.0)	VALVE BOX
30.	(W-08.1)	REPLACE, RAISE, OR RESET VALVE BOX
31.	(W-08.2)	RAISE VALVE BOX WITH RISER
32.	(W-09.0)	DUCTILE IRON TAPPING SLEEVE
33.	(W-09.1)	STAINLESS STEEL TAPPING SLEEVE
34.	(W-10.0)	FLUSHING DEVICE
35.	(W-11.0)	NEW WATER SERVICE
36.	(W-11.1)	REPLACEMENT WATER SERVICE
37.	(W-11.2)	WATER METER SEALING DETAIL
38.	(W-11.3)	PLASTIC METER PIT FOR 5/8" – 1" METERS



Standard Detail Drawings

39.	(W-11.4)	PLASTIC METER PIT FOR 1-1/2" – 2" METERS
40.	(W-11.5)	TYPICAL YARD HYDRANT
41.	(W-12.0)	TYPICAL SERVICE BOX DETAIL IN PAVED AREAS
42.	(W-12.1)	TYPICAL SERVICE BOX DETAIL IN NON-PAVED AREAS
43.	(W-12.2)	REPLACE, RAISE, OR RESET SERVICE BOX DETAIL
44.	(W-12.3)	RAISE SERVICE BOX WITH RISER DETAIL
45.	(W-13.0)	METER VAULT PIPING
46.	(W-13.1)	LARGE METER INSTALLATION
47.	(W-13.2) PIPE	STANDARD METER PIT FOR DUCTILE IRON WATER SERVICE
48.	(W-13.3) PIPE	OVERSIZE METER PIT FOR DUCTILE IRON WATER SERVICE
49.	(W-13.4) FOUNDATIO	TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH ON WALL
50.	(W-13.5) CONCRETE	TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH FLOOR
51.	(W-13.6)	32 X 8-INCH FRAME ONLY
52.	(W-13.7)	32-INCH STANDARD WATER COVER
53.	(W-13.8)	24-INCH REPLACEMENT WATER COVER
54.	(W-13.9)	26-INCH REPLACEMENT WATER COVER
55.	(W-13.10)	32-INCH COMPOSITE LOCKING COVER
56.	(W-13.11) FOUNDATIO	
57.	(W-13.12) CONCRETE	
58.	(W-13.13)	TYPICAL DUCTILE IRON FIRE SERVICE DETAIL IN A HOT



BOX

Standard Detail Drawings

- 59. (W-13.14) TYPICAL DIP COMMERCIAL & INDUSTRIAL SERVICE DETAIL THROUGH FOUNDATION WALL
- 60. (W-13.15) TYPICAL DIP COMMERCIAL & INDUSTRIAL SERVICE DETAIL THROUGH CONCRETE FLOOR
- 61. (W-14.0) THRUST BLOCK BEHIND FITTING
- 62. (W-14.1) THRUST BLOCKS
- 63. (W-15.0) RELATION OF VERTICAL DATUMS TO SPRINGFIELD CITY BASE DETAIL
- 64. (W-16.0) RECORD SKETCH DETAIL
- 65. (W-16.1) WATER SERVICE CARD DETAIL
- 66. (W-17.0) SEASONAL WATER SERVICE DETAIL
- 67. (W-17.1) SEASONAL WATER SERVICE BASE DETAIL
- 68. (W-17.2) SEASONAL WATER SERVICE COVER DETAIL

SEWER DETAILS

- 69. (S-01.0) TRENCH DETAIL FOR SEWER PIPES
- 70. (S-02.0) PRECAST CONCRETE SEWER MANHOLE
- 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) THAN 12 FT	SEWER SERVICE CONNECTION WITH CHIMNEY GREATER 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) BOX IN NO	LOW PRESSURE SANITARY SERVICE/MAIN 2-1/2" VALVE N-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) STRUCTUR	LOW PRESSURE SANITARY SEWER MAIN INLINE FLUSHING E DETAIL								
100.	(S-09.5)	LOW PRESSURE SANITARY SEWER MAIN TERMINAL								



FLUSHING STRUCTURE DETAIL

Springfield Water and Sewer Commission

Standard Detail Drawings

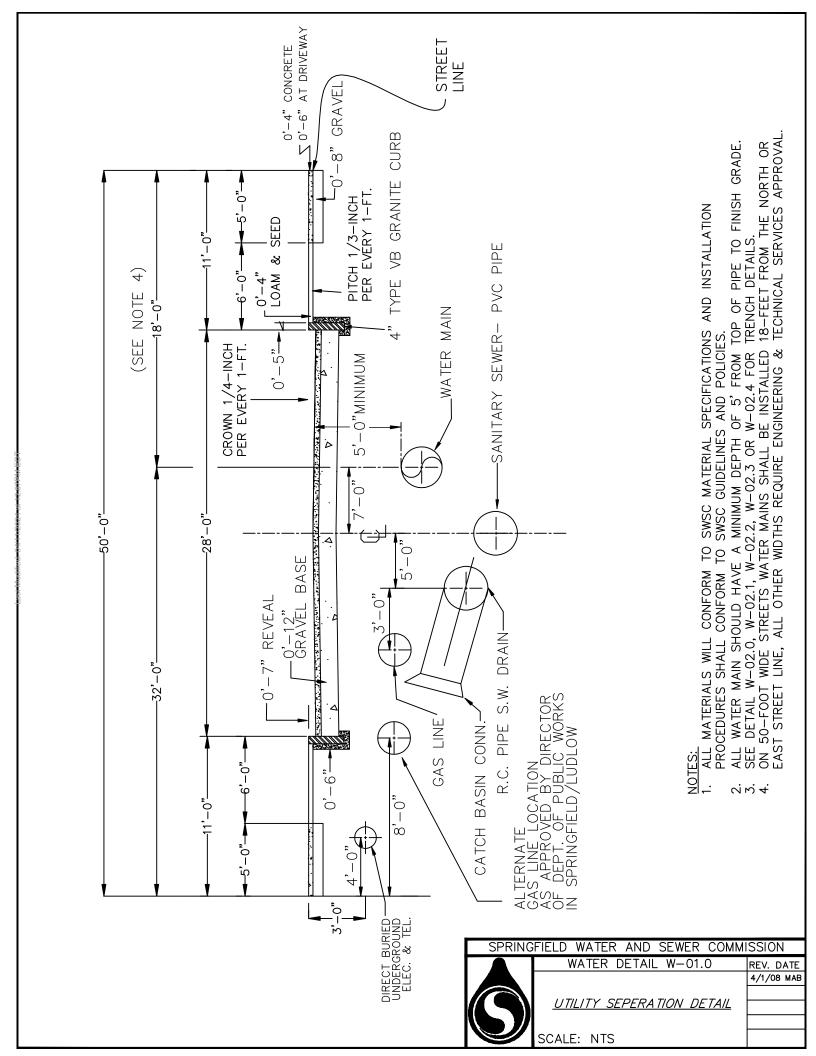
MAP DETAILS

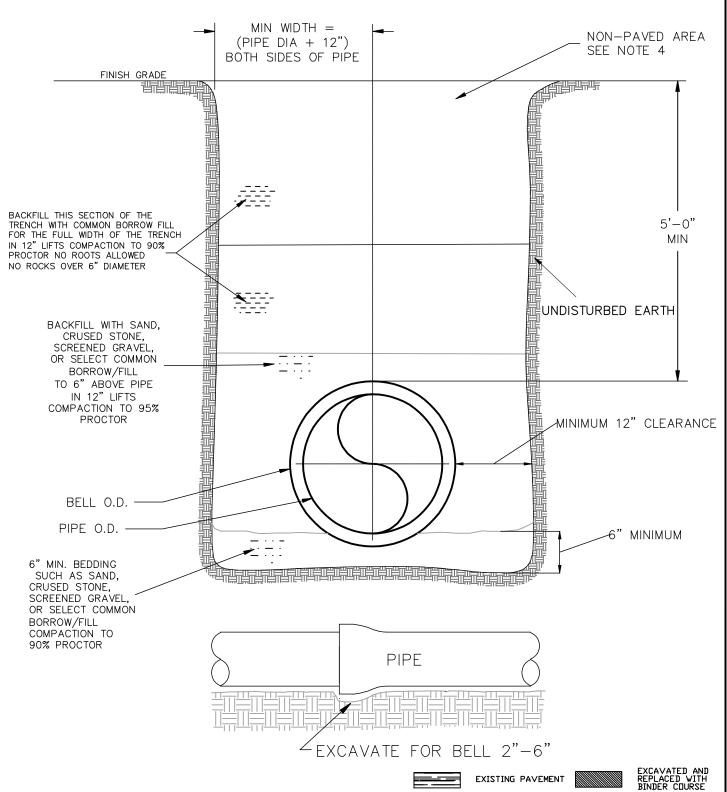
101.	(M-01.0)	SPRINGFIELD WATER MAINS SERVICE AREA MAP
102.	(M-02.0)	LUDLOW WATER MAINS SERVICE AREA MAP
103.	(M-03.0) MOUNTAIN	WATER TRANSMISSION MAINS SERVICE AREA MAP COBBLE TO PROVIN MOUNTAIN
104.	` /	WATER TRANSMISSION MAINS SERVICE AREA MAP PROVIN TO SPRINGFIELD
105.	M-04.0)	SPRINGFIELD SEWER MAINS SERVICE AREA MAP



Springfield Water and Sewer Commission Standard Detail Drawings







- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 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).



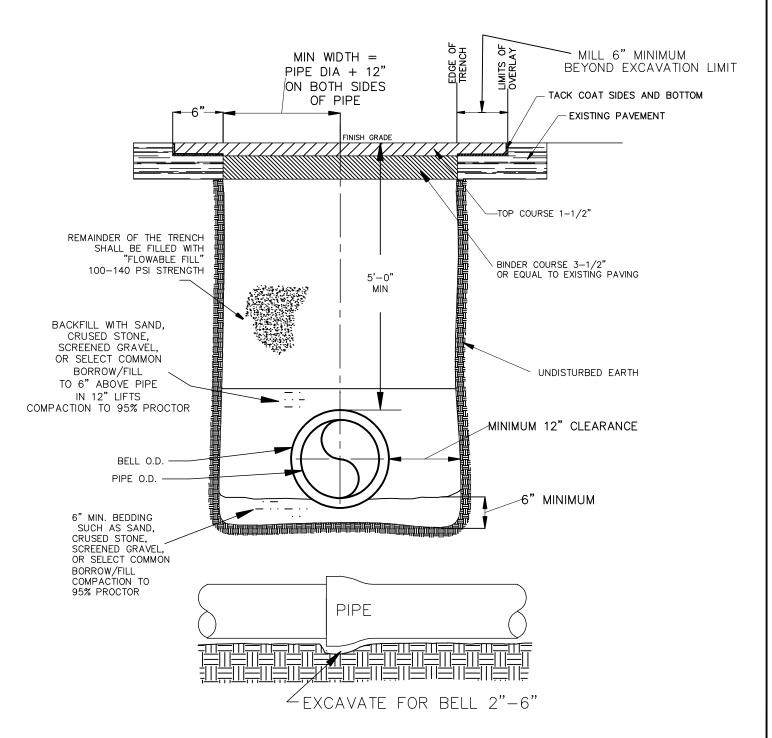
SPRINGFIELD WATER AND SEWER COMMISSION
WATER DETAIL W-02.0 REV. DATE

UNDISTURBED EARTH



NON-PAVED AREA TRENCH DETAIL 4/1/08 MAB

SCALE: NTS



- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
- FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
- REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
 REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
 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.
- 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

STRUCTURAL GRAVEL



EXCAVATED AND REPLACED WITH BINDER COURSE

BEDDING SAND



FLOWABLE FILL



COMMON BORROW

REV. DATE

4/1/08 MAB

MILLED AND REPLACED WITH TOP COURSE

UNDISTURBED EARTH

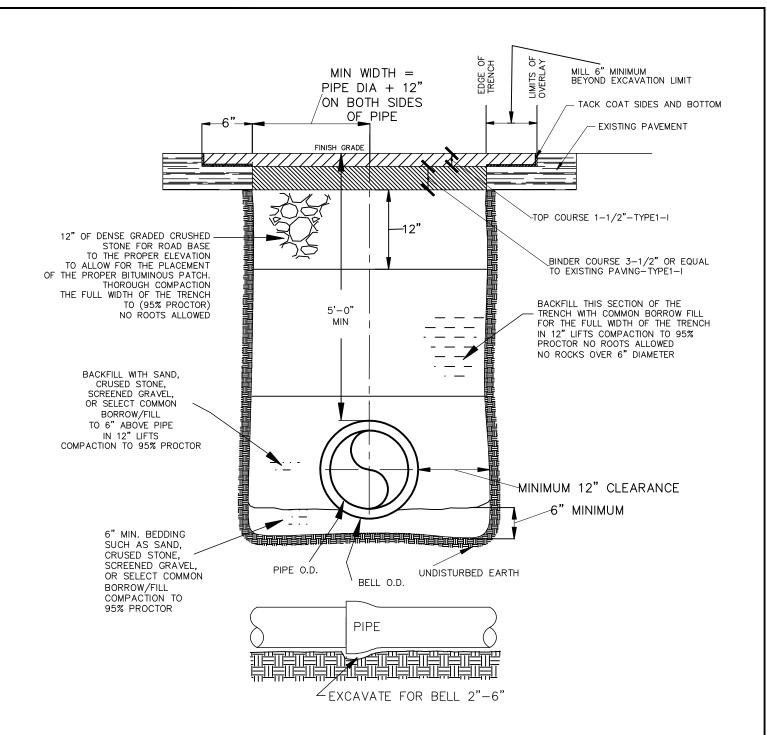
TACK COAT



SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-02.1

> TRENCH BACKFILLING-METHOD 1 FOR LUDLOW ROADWAYS

SCALE: NTS



- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
- TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN
- ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
- REALS.

 REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.

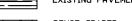
 REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.

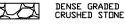
 ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS
- AND BRIDGES.
- SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
- MILL TO REMOVE TOP COURSE.
- 12. LEAVE 12—INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.

 13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6—INCH LIFTS.
- 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.













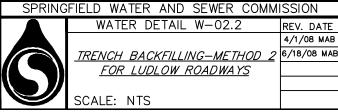
TACK COAT

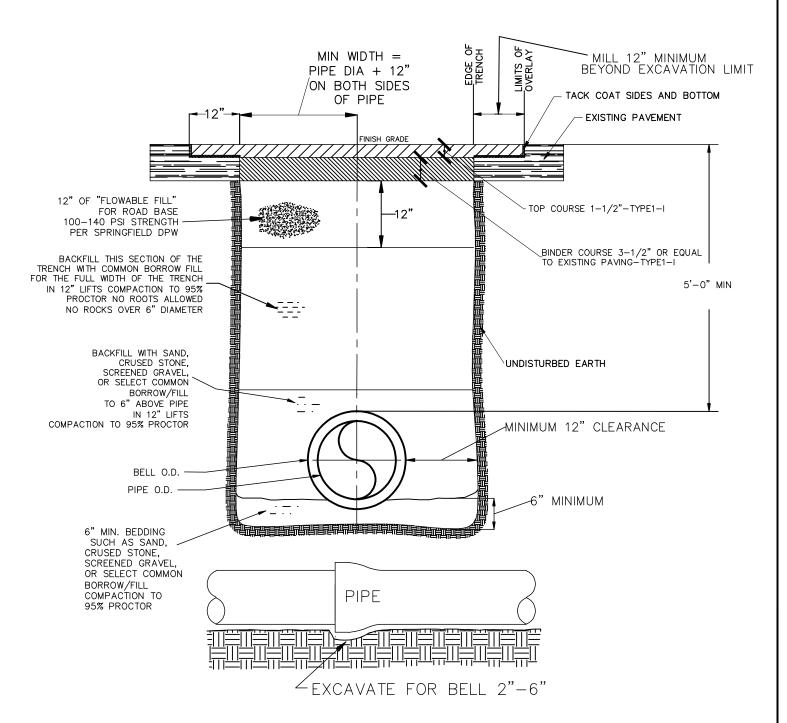
EXCAVATED AND REPLACED WITH BINDER COURSE

COMMON BORROW



UNDISTURBED **EARTH**





ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND

INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE

TO FINISH GRADE.

SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN

ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.

FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).

REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARÉ TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.

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

TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.

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



MILLED AND REPLACED WITH TOP COURSE

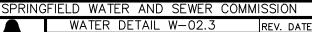


COMMON BORROW



UNDISTURBED EARTH

TACK COAT

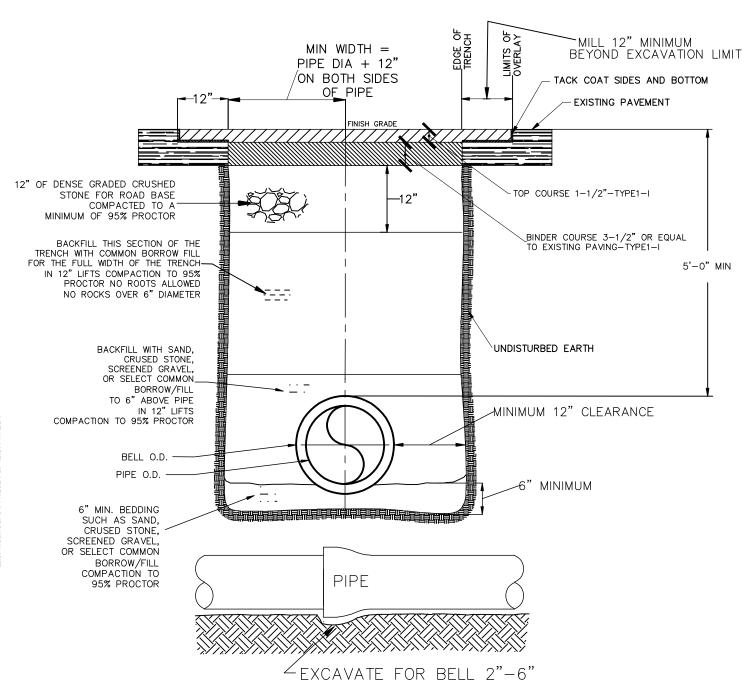




TRENCH BACKFILLING-METHOD FOR ARTERIAL STREETS IN SPRINGFIELD

SCALE: NTS

4/1/08 MAB 6/18/08 MAB



- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
- TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED
- FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
- REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
 REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
 ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS
- AND BRIDGES.

- 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



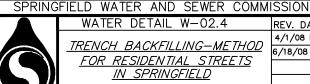
TACK COAT



MILLED AND REPLACED WITH TOP COURSE



UNDISTURBED

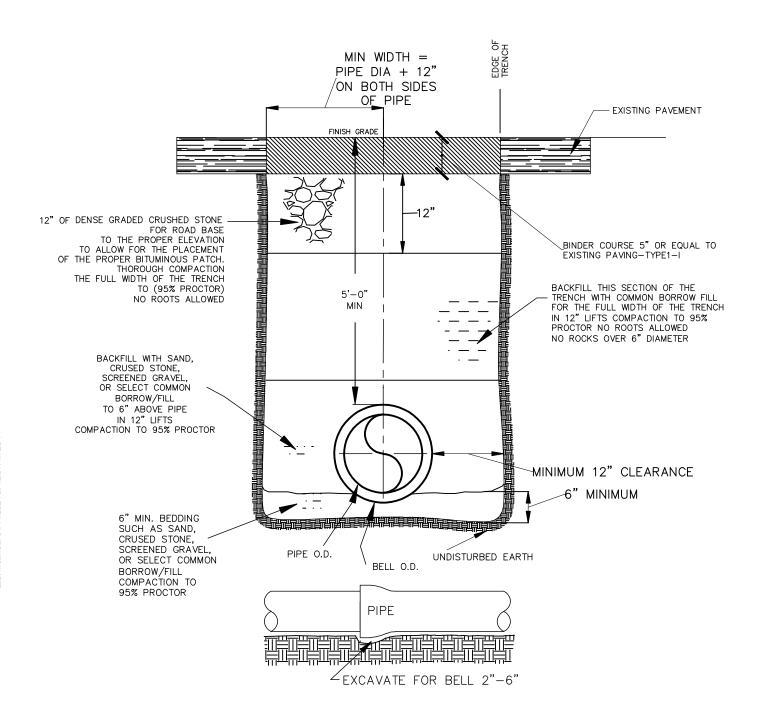


<u>TRENCH BACKFILLING-METHOD</u> FOR RESIDENTIAL STREETS IN SPRINGFIELD

SCALE: NTS

4/1/08 MAB 6/18/08 MAB

REV. DATE



- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE
- TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN
- ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED
- FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).

 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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 ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS
- AND BRIDGES.
- SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
- 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.
- 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

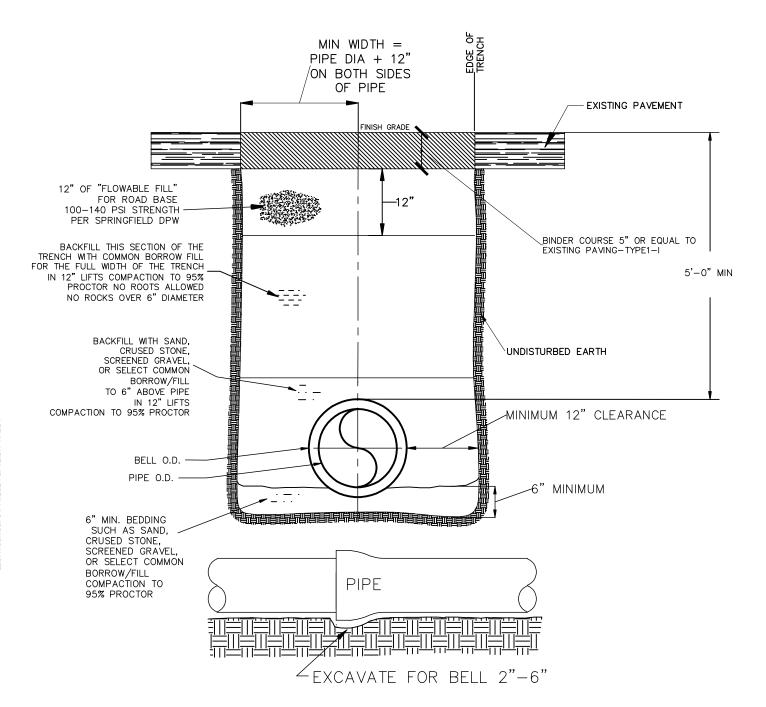
BEDDING SAND

UNDISTURBED EARTH

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-02.5 REV. DATE TEMPORARY TRENCH 6/18/08 MAB BACKFILLING-METHOD FOR ALL STREETS IN

SPRINFIELD & LUDLOW
ACCEPT SPRINFIELD ARTERIALS SCALE: NTS



- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE

- TO FINISH GRADE.

 SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

 REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN

 ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
- FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
- REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARÉ TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
- ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
- 10.
- 11.
- SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
 MILL TO REMOVE TOP COURSE.
 LEAVE 12—INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE. 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
- TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
- 15. 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

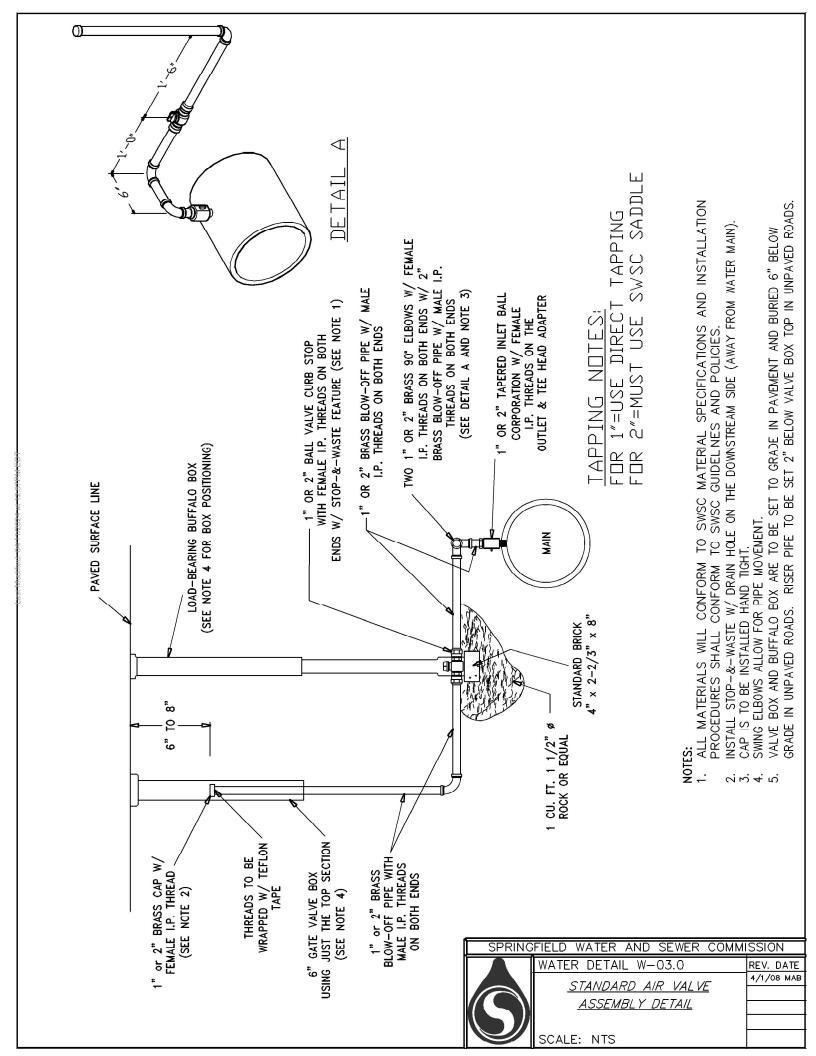


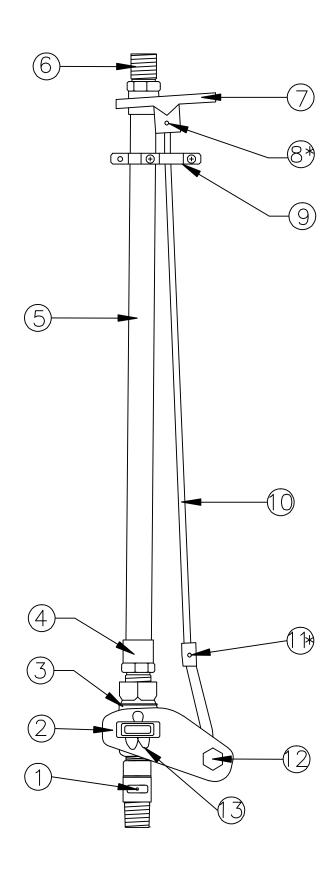
COMMON BORROW

SEWER COMMISSION

SPRINGFIELD WATER AND

WATER DETAIL W - 02.6REV. DATE 6/18/08 MAB TEMPORARY TRENCH BACKFILLING-METHOD FOR ALL ARTERIAL STREETS IN SPRINGFIELD SCALE: NTS



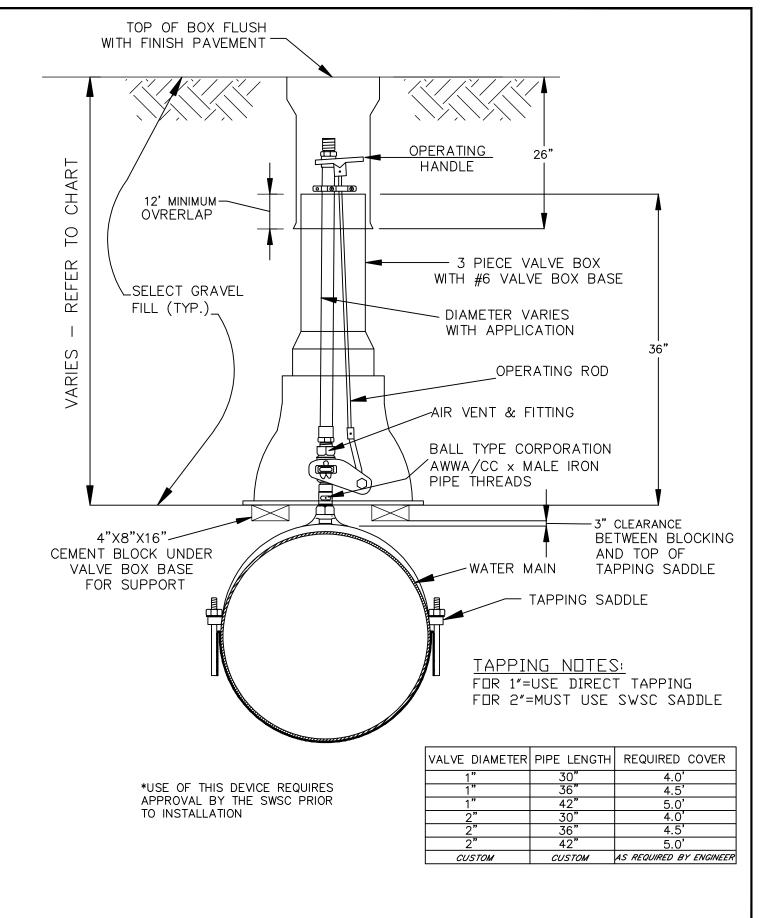


NO.	DESCRIPTION
1	BALL TYPE COPORATION:
	USE (Mueller B25008) OR APPROVED EQUAL.
	AWWA/CC X Male Iron Pipe (IP) Threads
2	LOWER OPERATING LEVER: Cast or Stamped Brass to Spec.
3	BALL TYPE CURB STOP:
	FOR 1" AIR VALVE: USE (FORD B11-444SW) OR APPROVED EQUAL.
	FOR 2" AIR VALVE: USE (FORD B11-777SW) OR 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) T-HANDLE:
7	Cast Brass
8*	OPERATING ROD T-HANDLE SECUREMENT:
0.	Stainless Steel Roll Pin
9	ROD TO RISER CONNECTION:
	Split Ring (By Size of Riser), Attached to ½" Split Ring by Coated ¾"—16 x 1 ¼" Set Screw and Stainless Steal ¾" 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

*- VISUALLY OBSTRUCTED

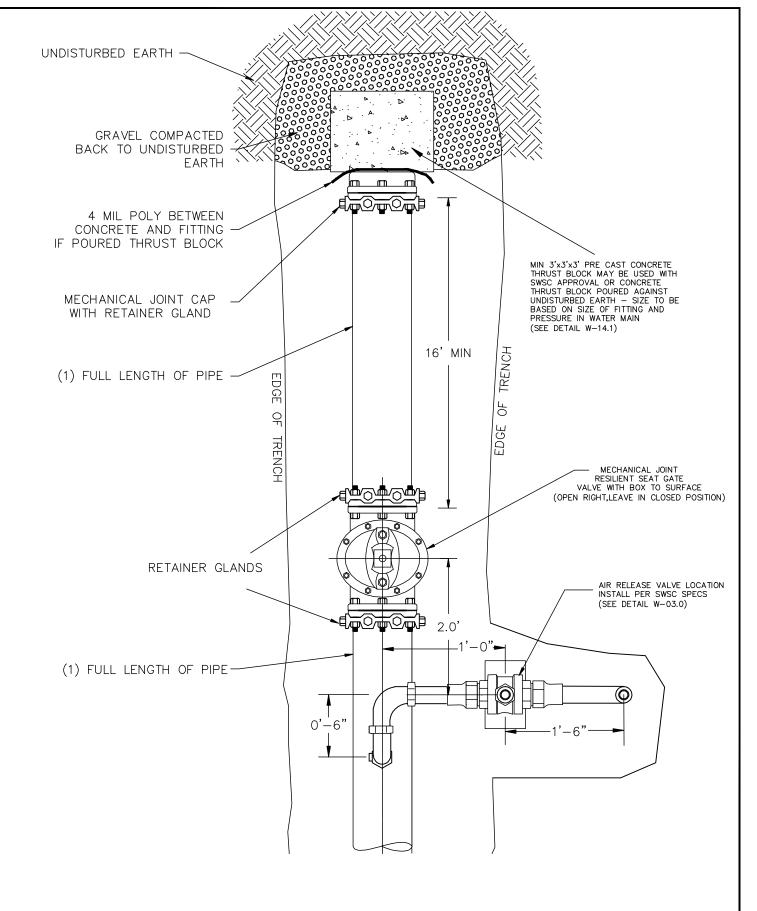
*USE OF THIS DEVICE REQUIRES APPROVAL BY THE SWSC PRIOR TO INSTALLATION

CDDING	FIELD WATED AND CEWED COMM	ICCION								
SPRING	SPRINGFIELD WATER AND SEWER COMMISSION									
	WATER DETAIL W-03.1	REV. DATE								
		4/1/08 MAB								
	<u>AIR VALVE</u>									
	ONE PIECE ASSEMBLY DETAIL									
	SCALE: NTS									



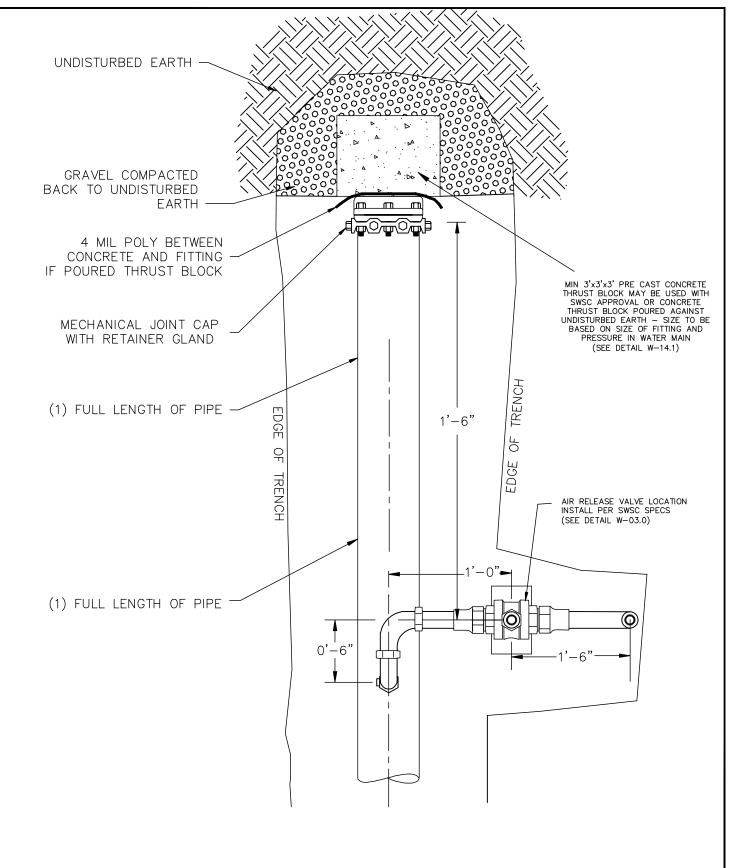
- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND OLICIES.
- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRING	FIELD WATER AND SEWER COMMI	ISSION
	WATER DETAIL W-03.2	REV. DATE
	<u>AIR VALVE</u>	
	ONE PIECE ASSEMBLY DETAIL	
	SCALE: NTS	



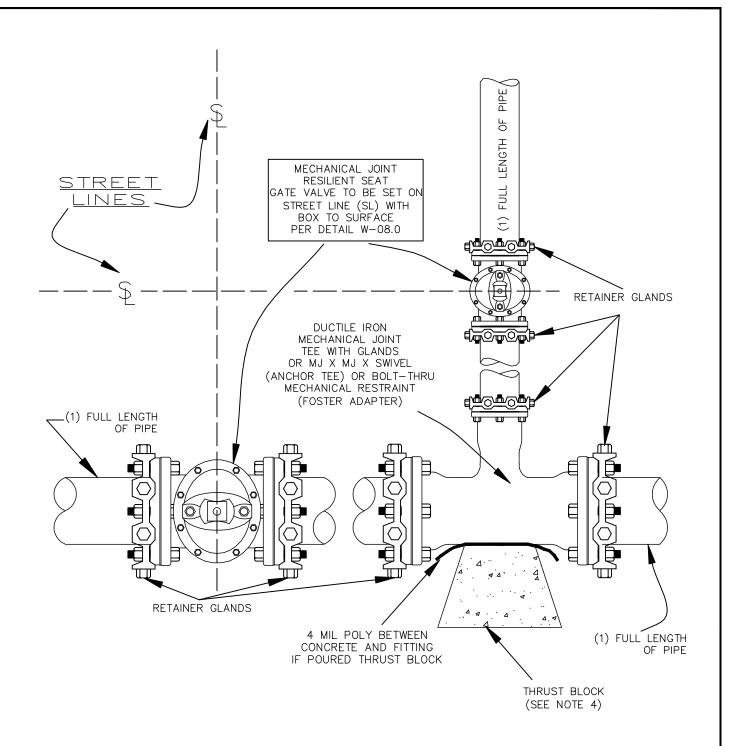
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- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION							
	WATER DETAIL W-04.0	REV. DATE					
		4/1/08 MAB					
	<u>END OF MAIN</u>						
	SCALE: NTS						



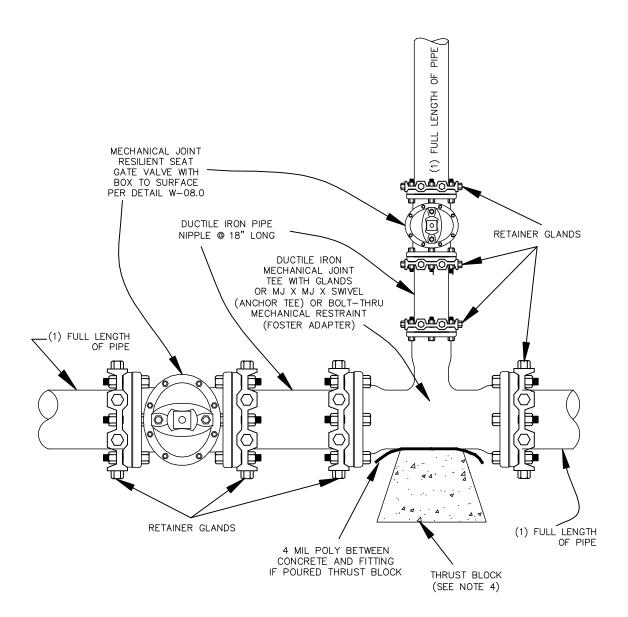
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- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION								
	WATER DETAIL W-04.1	REV. DATE						
		4/1/08 MAB						
	END OF MAIN DETAIL							
	END OF WAIN DETAIL							
	SCALE: NTS							



- 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.
- 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).
- 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).
- FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

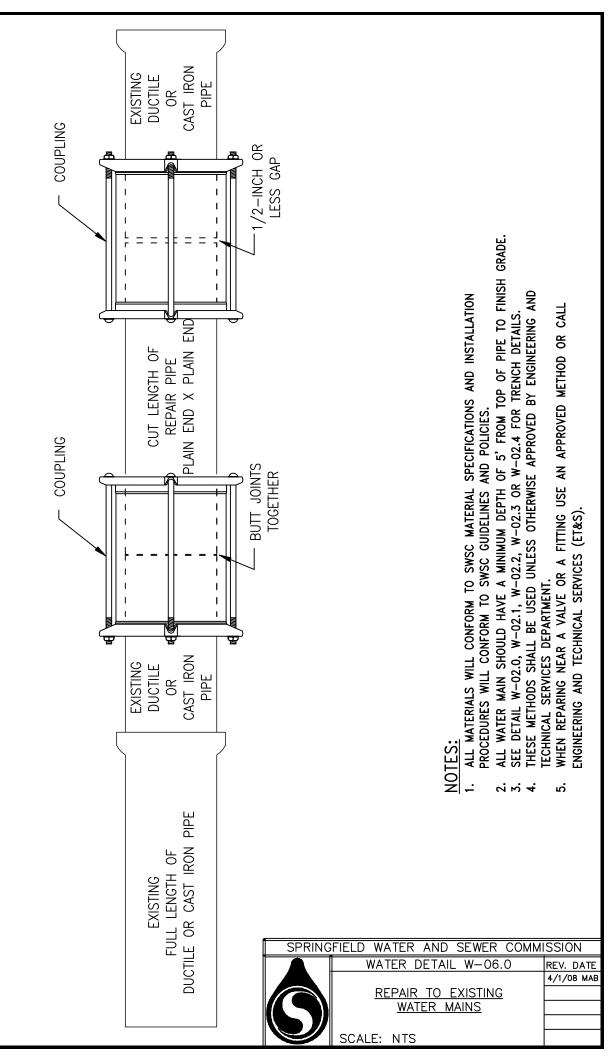
SEWER COMMISSION
W-05.0 REV. DATE
4/1/08 MAE
NICTALL ATION
<u>NSTALLATION</u>

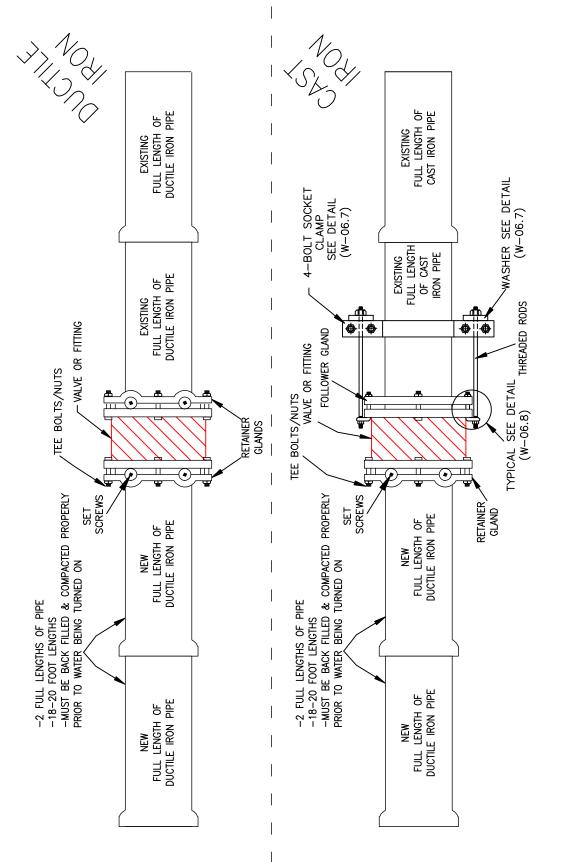


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- ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
- 4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH SWSC APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN SEE DETAIL (W-14.1).
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- 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

SPRING	FIELD WATER AND SEWER COMMI	SSION
	WATER DETAIL W-05.1	REV. DATE
	ALTERNATE 1	4/1/08 MAB
	<u>TEE INSTALLATION</u>	
	SCALE: NTS	





SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-06.1

SCALE: NTS

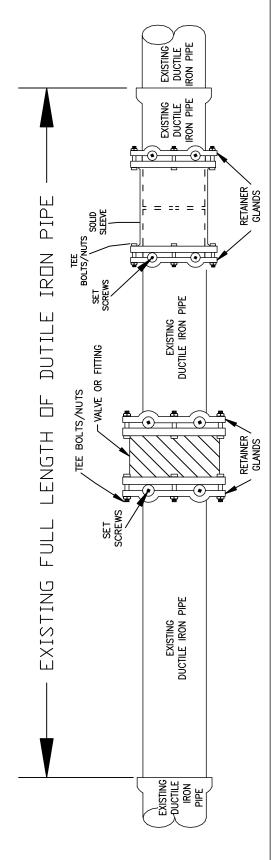
INSTALL VALVE OR FITTING

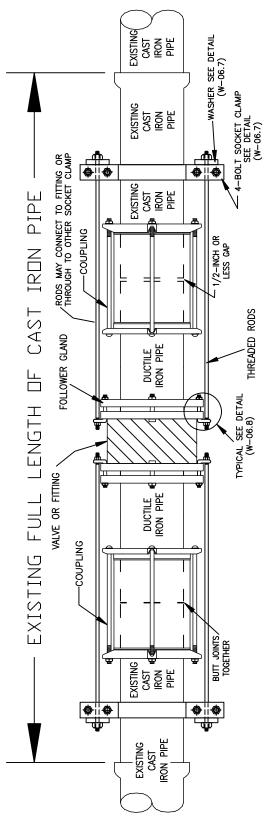
AT A DEAD END

OF A WATER MAIN

- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
 - NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
 - IHREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL. 2 6 4 6 9
- STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
 - EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
- RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
- ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

REV. DATE 4/1/08 MAB





SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-06.2

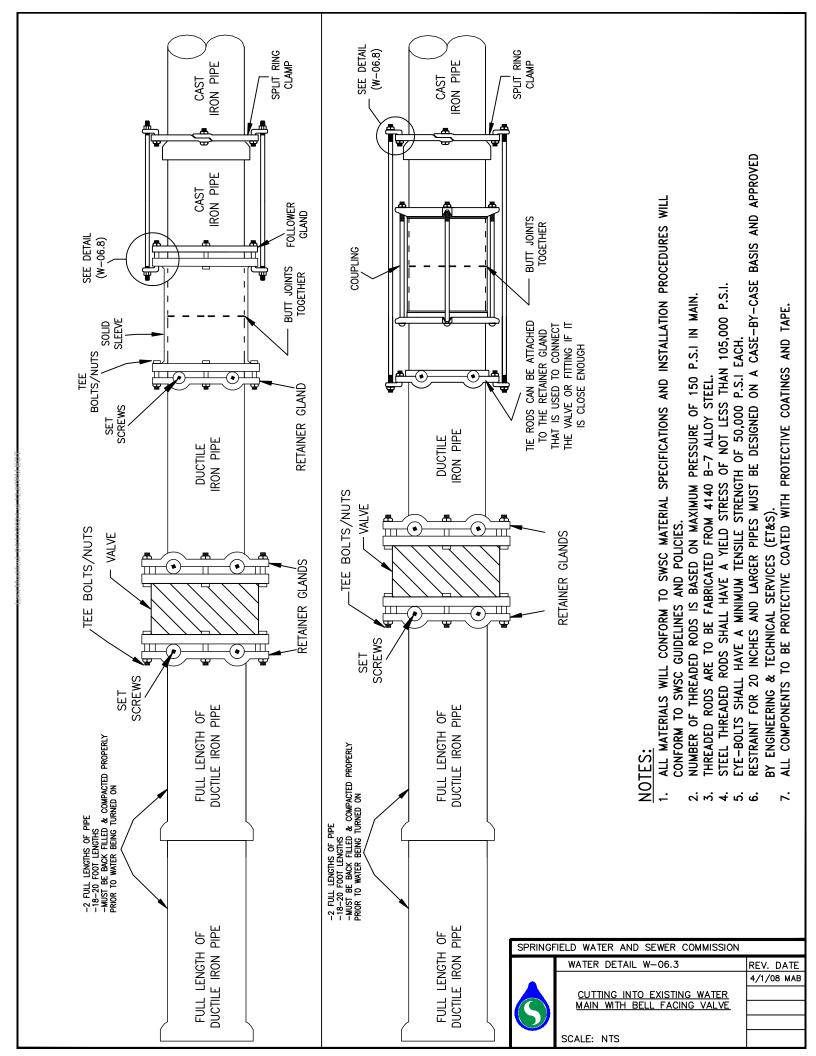
SCALE: NTS

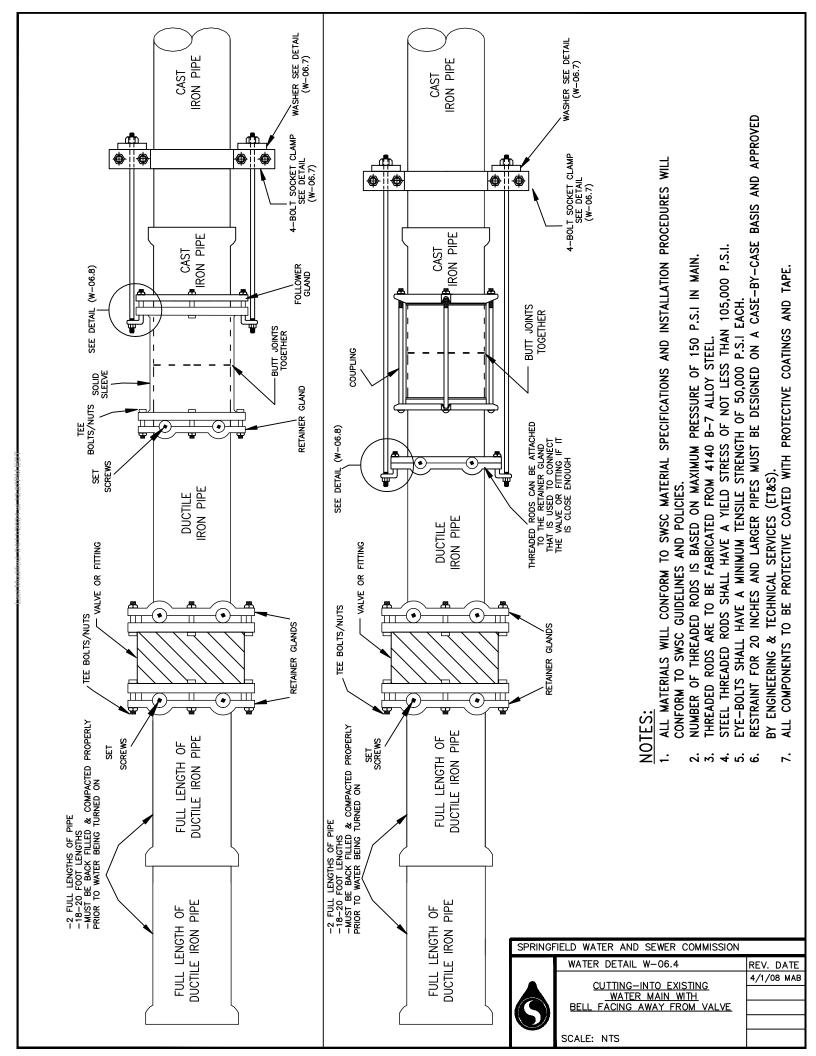
CUTTING-INTO EXISTING WATER MAIN TO REPLACE
VALVE OR FITTING

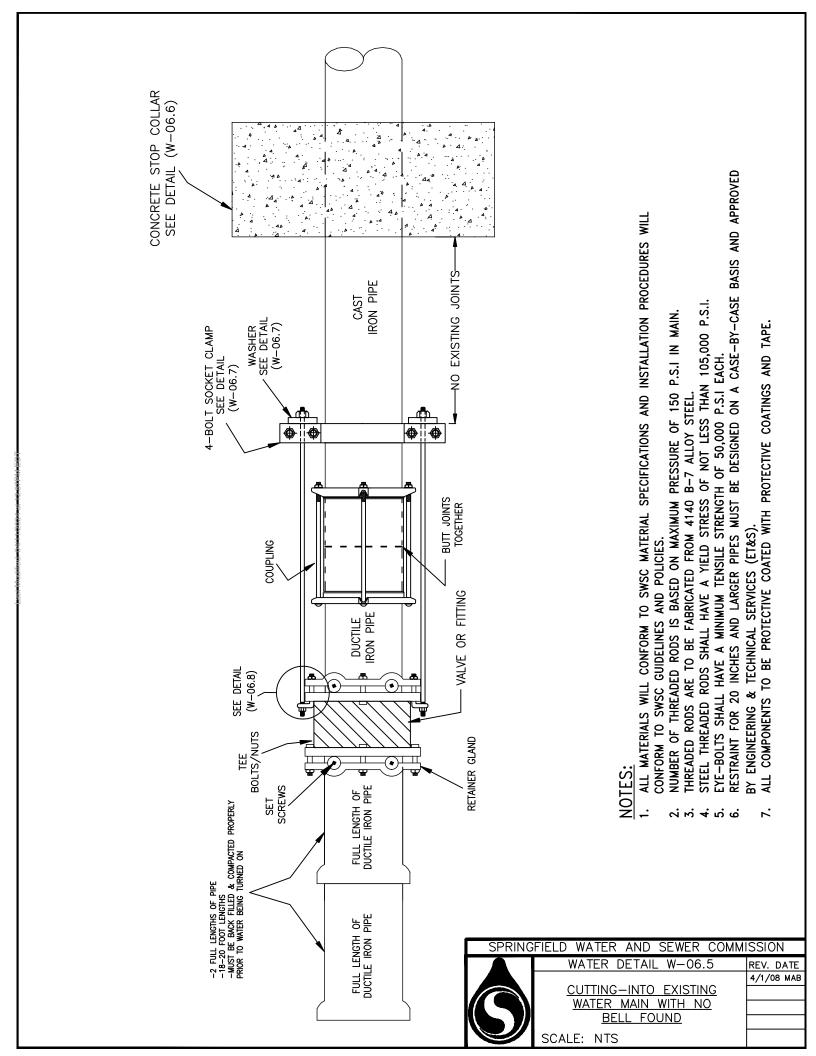
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 - 4
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 - ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

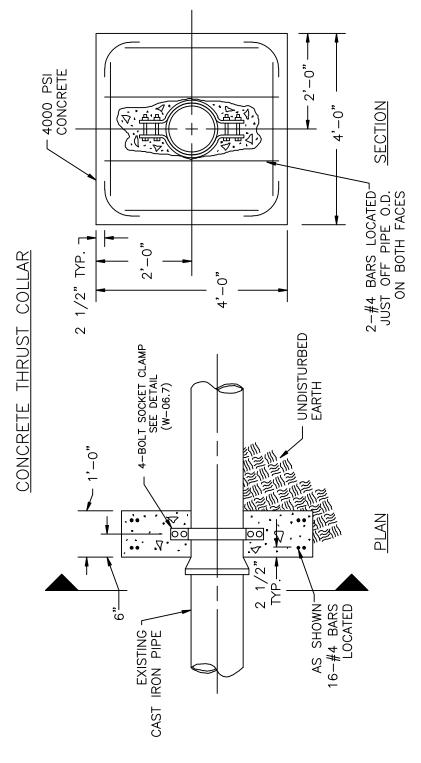
۲.

REV. DATE 4/1/08 MAB









SPECIAL NOTE:

MECHANICALLY RESTRAIN (BY APPROVED METHOD) THREE (3) FULL PIPE LENGTHS FROM PROPOSED LOCATION OF STOP COLLAR. 1. IN LIEU OF CONCRETE STOP COLLAR THE CONTRACTOR MAY

NOTES:

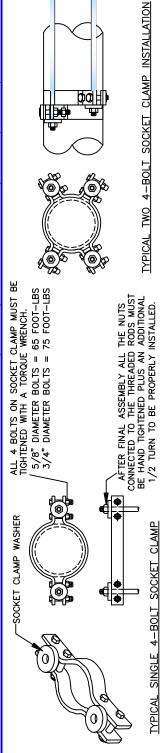
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- RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S)

ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-06.6 REV. DATE 4/1/08 MAB CONCRETE THRUST COLLAR SCALE: NTS

CHART DATA CLAMP SOCKET

Associated Hardware	notes 2, 5, 6, 8, & 9	notes 2, 5, 6, 8, & 9			her manufacturer.	t of another manufacturer.		f another manufacturer.							
Nominal Threaded Number of Rod (7) Nominal Diameter Threaded in inches) Rod (7)	-		1	_	1	2			oduct of ano	equal produc		ual product o			
Nominal Threaded Rod (7) Dianeter (in inches)	3/4	3/4	3/4	3/4	I	1			r the equal pr	e 258, or the		42, or the eq			
Size of Steel Clamp Washer (4) (in inches)	3 dia or 3 x 3	3-1/2 dia or 3-1/2 x 3-1/2			d Patterson, Figure 158DB, o	arpenter and Patterson, Figur		ping Specialties, Inc. – Style 4							
Thickness of Steel Clamp Washer (4) (in)	1/2	1/2	1/2	1/2	1/2	1/2			Carpenter at	eB3134W, (ead	7, Dresser Pi			
Size of CI Clamp Washer (4) (in inches)	3 dia or 3 x 3	3-1/2 dia or 3-1/2x3-1/2	4 dia or 4 x 4		tion 24	Socket Clamps shall be as provided by PHD Manufacturing. Inc. Figure 590, Anvil Company, Figure 595, Cooper B-Line, Figure B3134, Carpenter and Patterson, Figure 158DB, or the equal product of another manufacturer	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	Bent Eye Bolts shall be constructed of high strength low alloy steel, per ASTM A588, grade B, Unified National Coarse (UNC) rolled thread	Bent Eye Bolts shall be as provided by PHD Manufacturing. Inc Figure 598B, Star National Products - Figures 34" SST 747 or 34" SST 757, Dresser Piping Specialties, Inc Style 442, or the equal product of another manufacturer	Threaded Rods shall be constructed of 4140-alloy steel, per ASTM A193, grade B7, Unified National Coarse (UNC) rolled thread	grade 2, Rockwell hardness B55	National Coarse (UNC) thread.			
Thickness of CI Clamp Washer (4) (in inches)	8/8	8/8	8/8	8/8	3/4	1		tion Associat	Figure 595, (ompany, Fig	, Unified Nat	Products - Fi	lational Coars		ied National
Minimum Bolt Size (in inches)	5/8 x 3 1/2	5/8 x 3 1/2	5/8x4	3/4x4	7/8x41/2	1x41/2		All Socket Clamps and associated hardware shall meet the requirements of National Fire Protection Association 24	nvil Company,	re 595, Anvil C	A 588, grade B	, Star National	e B7, Unified N	Washers for bent eye bolts shall be cadmium plated and constructed of case hardened C1006 steel	te 2H, and Unif
	1/2	1/2	8/8	8/8	8/8	3/4		nents of Nati	Figure 590, A.	ing Inc. Figu	d, per ASTM	- Figure 598B	A A193, grad	ed of case har	M A194, grad
Length of Width of Thickness Clamp (2 Clamp (2 of Clamp &3) &3) (2 &3) (in inches) (in inches)	21	cı	2 1/2	2 1/2	3	4		st the requirer	cturing Inc.	Manufactur	low alloy ster	acturing, Inc.	el, per ASTN	end construct	m steel, AST
Length of Clamp (2 & & & & & & & & & & & & & & & & & &	14 5/8	16 7/8	19 1/8	21 3/8	25 1/8	31 3/8		are shall me	HD Manufa	ided by PHL	igh strength	PHD Manufa	140-alloy ste	num plated a	nedium carbo
Clamp (2 & 3) Length of Width of Thickness Inside Clamp (2 Clamp (2 Clamp Diameter & 3) & 3) (in inches) (in inches)	5	7 1/8	9 5/16	11 1/2	13 1/2	8/L L1	res sure	oiated hardw	rovided by I	all be as prov	structed of h	orovided by 1	structed of 4	shall be cadn	istructed of n
Force (1) on Clamp (in lbs.)	4550	9340	16080	24180	34230	09112	ostatic Test I	mps and asso	s shall be as p	3 Washers sh	s shall be con	s shall be as t	s shall be con	ant eye bolts	s shall be con
Max Clamp (2 & 3)	250	250	250	250	250	115	At Max Hy drostatic Test Pressure	All Socket Cla	Socket Clamp:	Socket Clamp:	Bent Eye Bolt	Bent Eye Bolt	Threaded Rod	Washers for bu	9 Heavy hexnuts shall be constructed of medium carbon steel, ASTM A194, grade 2H, and Unified
Nominal Pipe Size (in inches)	ব	9	8	10	12	16		2	3	4	5	9	7	∞	0



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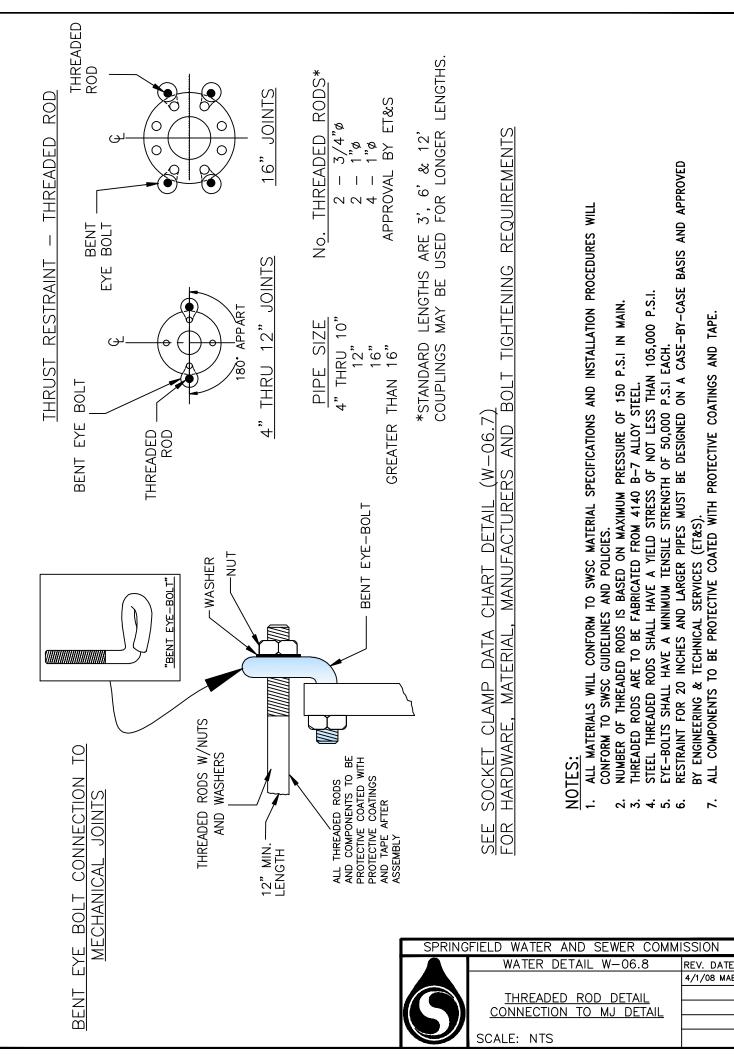
NOTES:

- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
 - NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
 - THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
 - STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH. 2 2 4 5 6
- RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED
 - ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE. 3Y ENGINEERING & TECHNICAL SERVICES (ET&S) ۲.

SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-06.7 REV. DATE 4/1/08 MAB 6/18/08 MAB SOCKET CLAMP DETAIL

SCALE:

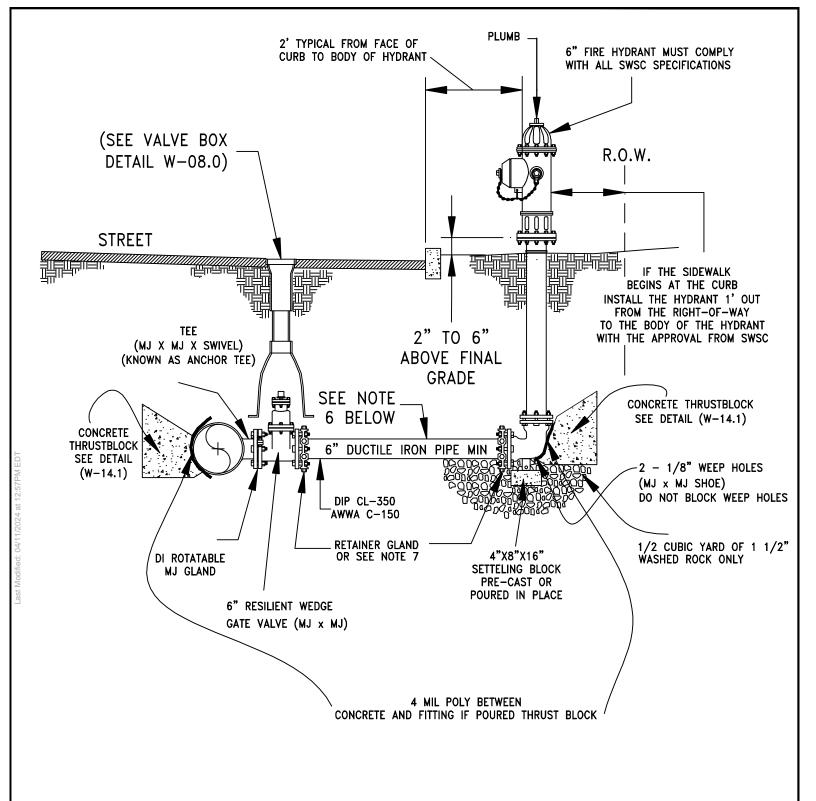
NTS



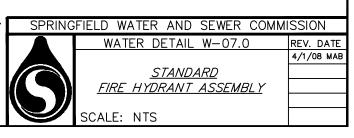
ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

BY ENGINEERING & TECHNICAL SERVICES (ET&S).

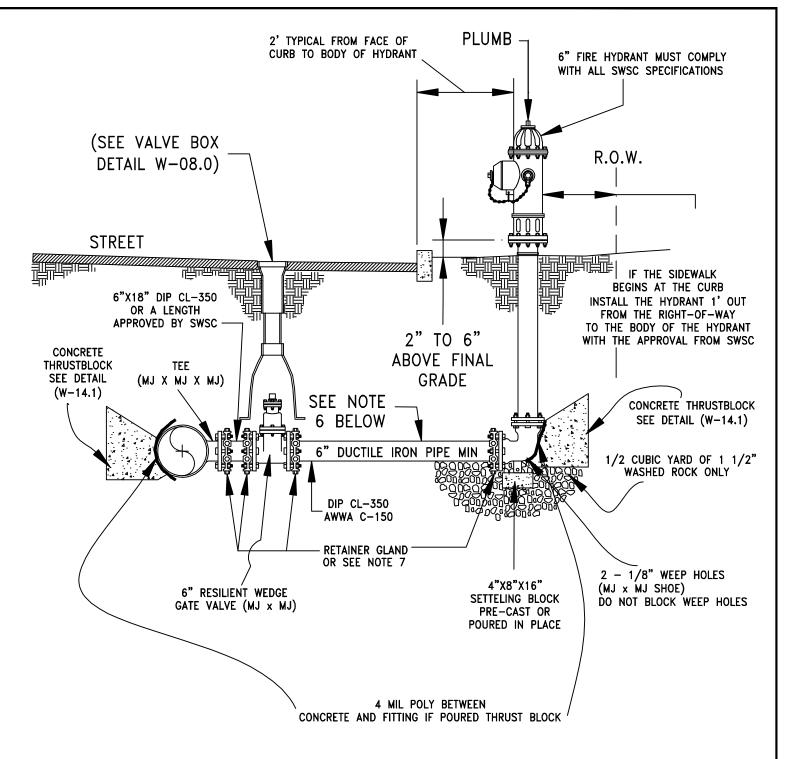
4/1/08 MAB



- 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).



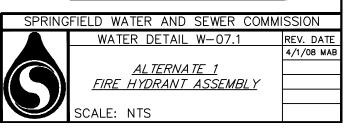


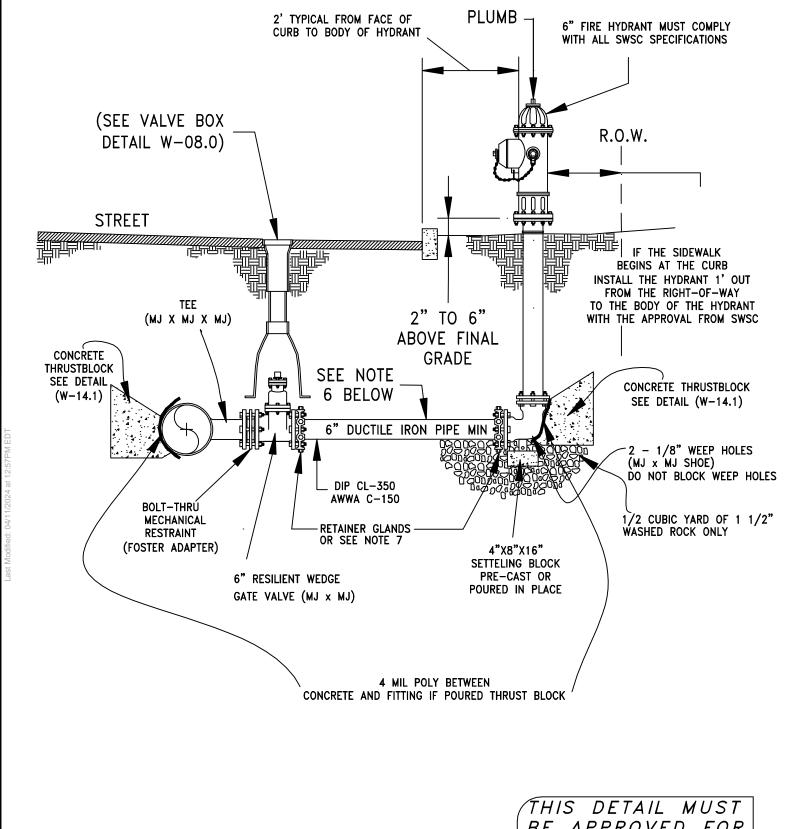


1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.

- 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).

THIS DETAIL MUST BE APPROVED FOR USE BY THE S.W.S.C BEFORE IT CAN BE INSTALLED





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.

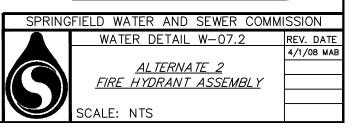
 ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.

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).

THIS DETAIL MUST
BE APPROVED FOR
USE BY THE
S.W.S.C BEFORE IT
CAN BE INSTALLED

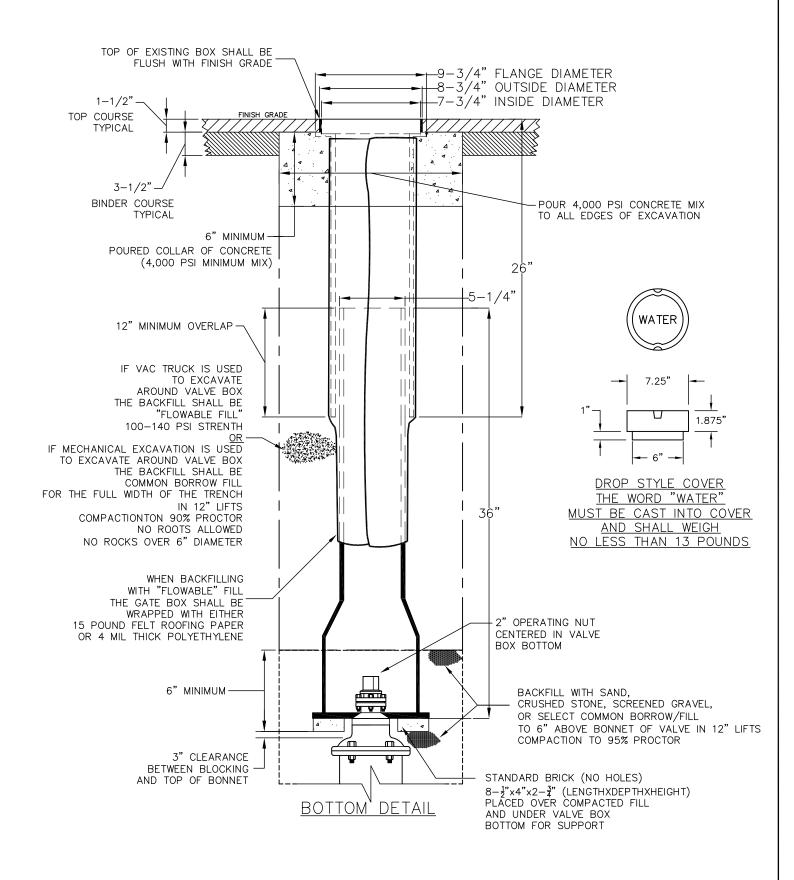


- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
- 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	REV. DATE						
	RELOCATION OF	4/1/08 MAB						
	FIRE HYDRANT ASSEMBLY							
	<u>(STRAIGHT BACK)</u>							
	SCALE: NTS							

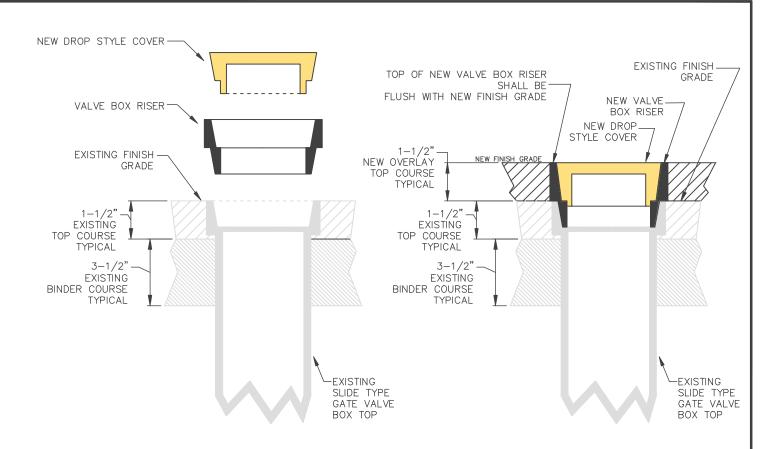
- AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
- 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 4/1/10 MAB 1/9/19 DJP SCALE: NTS

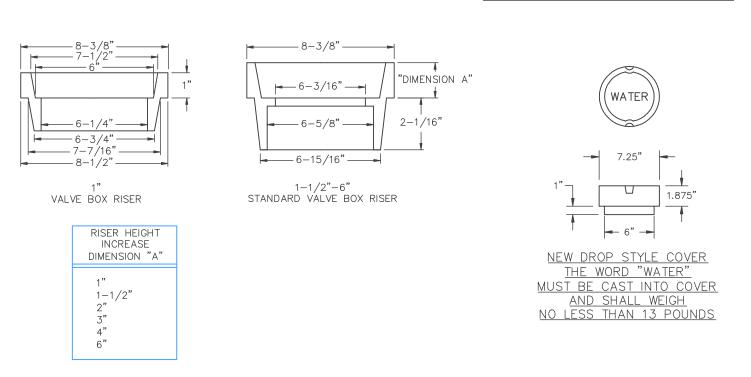


- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-08.1 REPLACE, RAISE OR RESET VALVE BOX SCALE: NTS

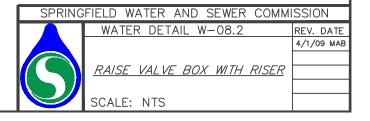


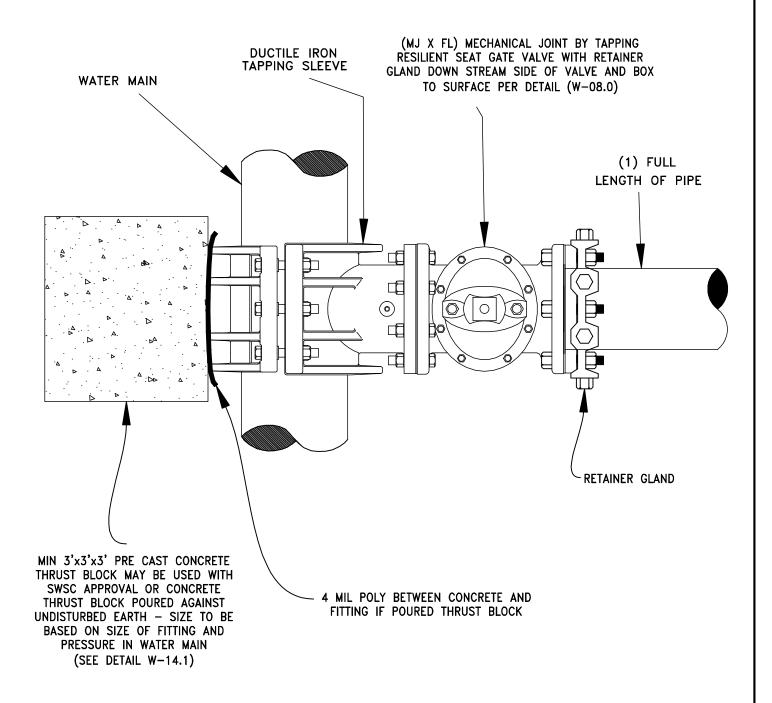
VALVE BOX RISER INSTALLED



NOTE: THESE RISERS WILL WORK SATISFACTORILY WITH MOST 5-1/4" VALVE BOXES.

- 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.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

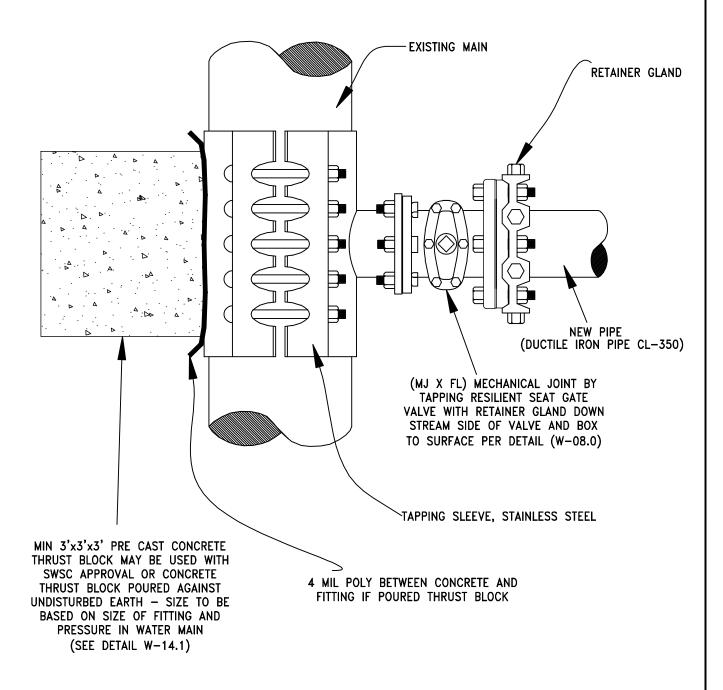




- NOTES:

 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							
	<u>DUCTILE IRON</u>								
	<u>TAPPING SLEEVE</u>								
	SCALE: NTS								

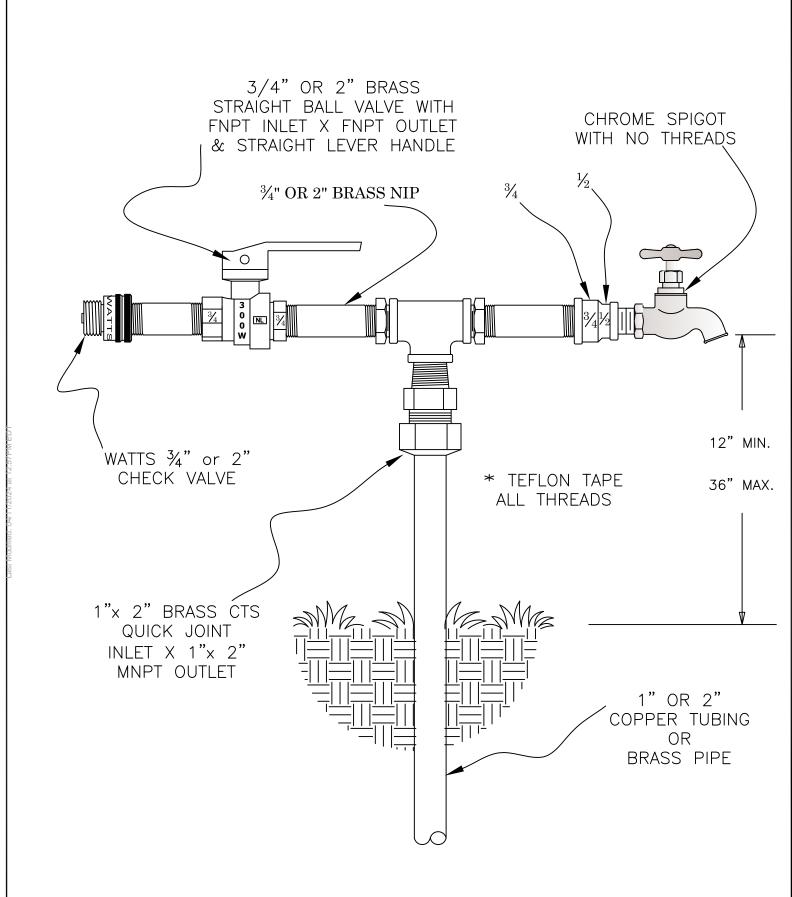


- NOTES:

 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM

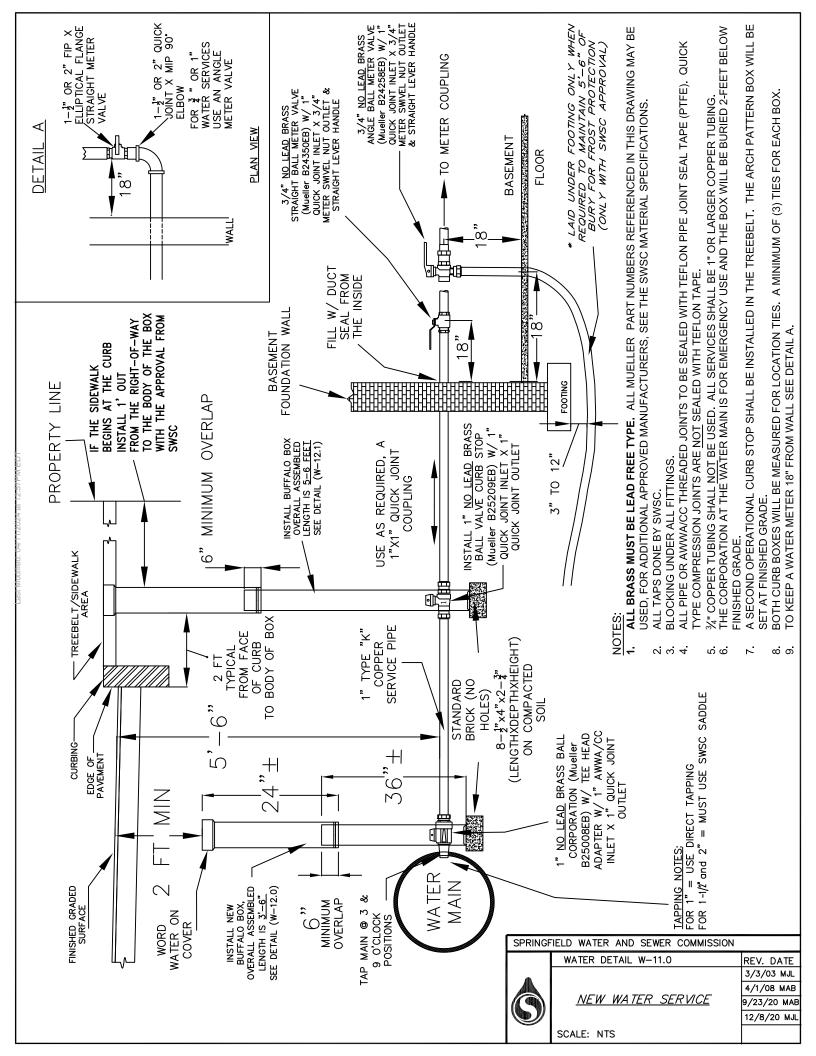
 TO SUID LINES AND POLICIES.
- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

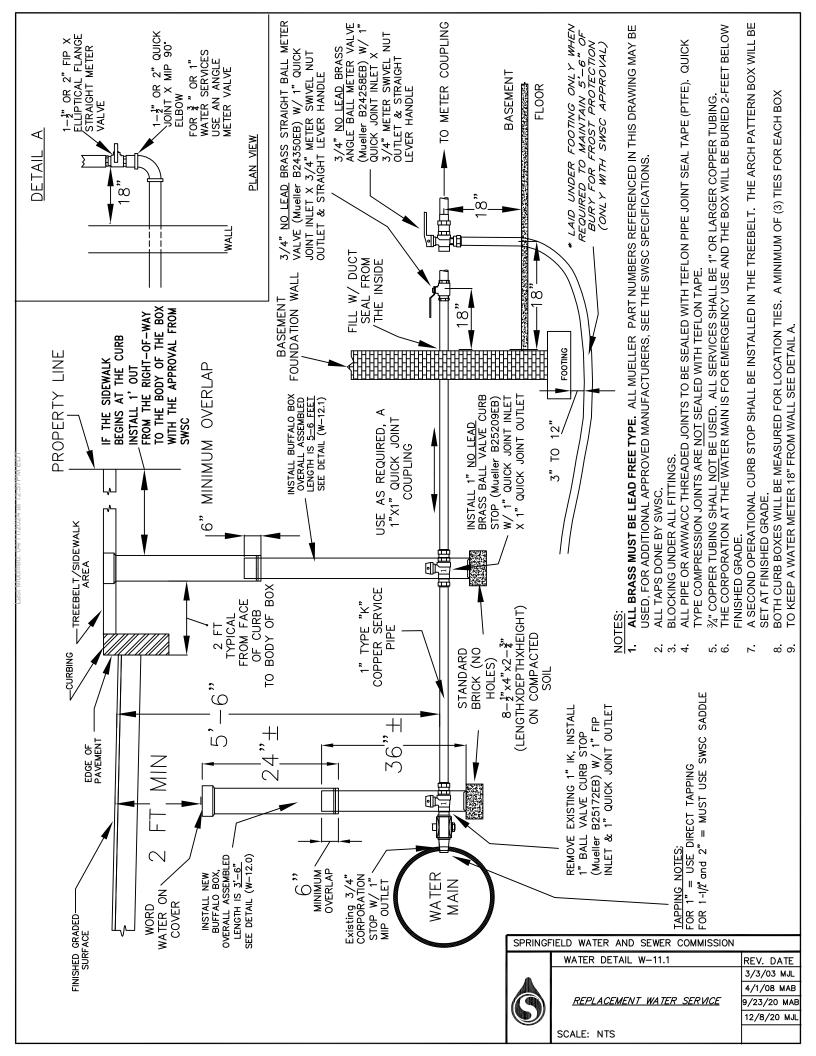
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-09.1	REV. DATE
		4/1/08 MAB
	<u>STAINLESS STEEL</u>	
	<u>TAPPING SLEEVE</u>	
	SCALE: NTS	



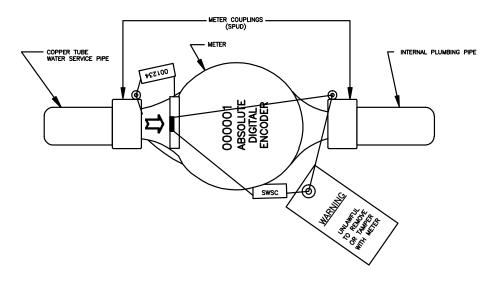
 ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-10.0	REV. DATE
		1/6/07 MJL
	FLUSHING DEVICE	4/1/08 MAB
	TEOSITING DEVICE	6/18/08 MAB
	SCALE: NTS	

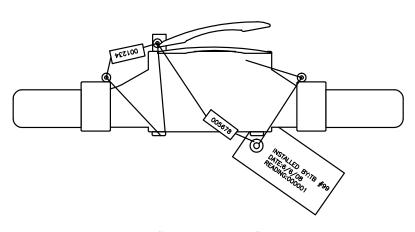




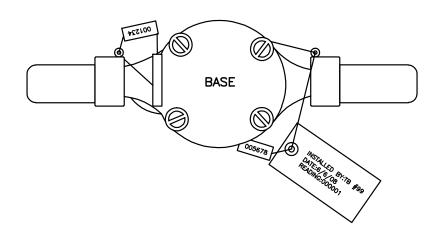
"TOP VIEW"



"SIDE VIEW"



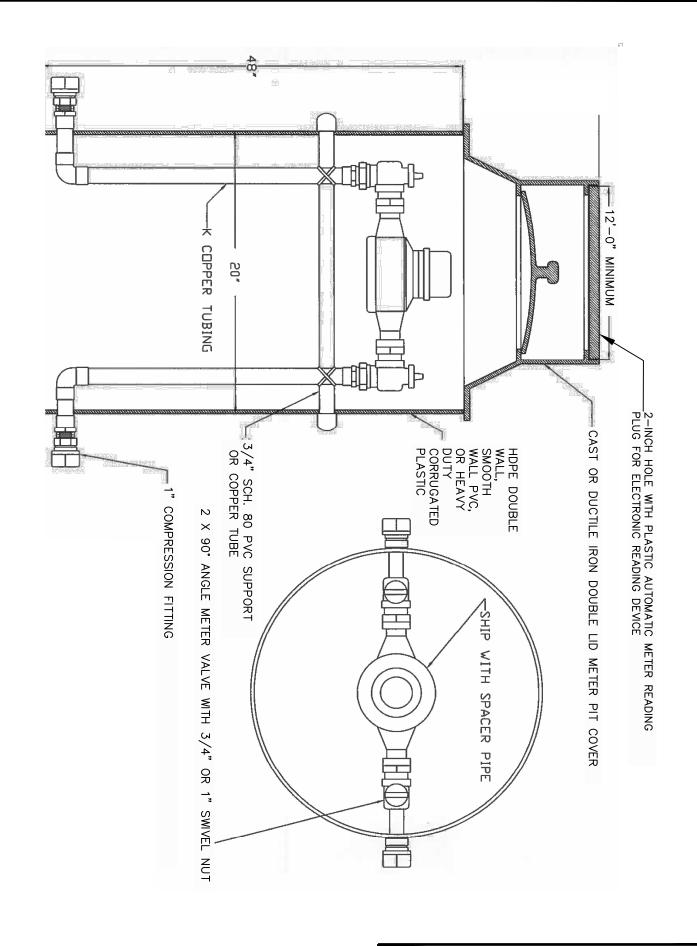
"BOTTOM VIEW"



NOTES:

1. METERS SHALL BE SEALED BY COMMISSION INSTALLERS & METER READERS ONLY.

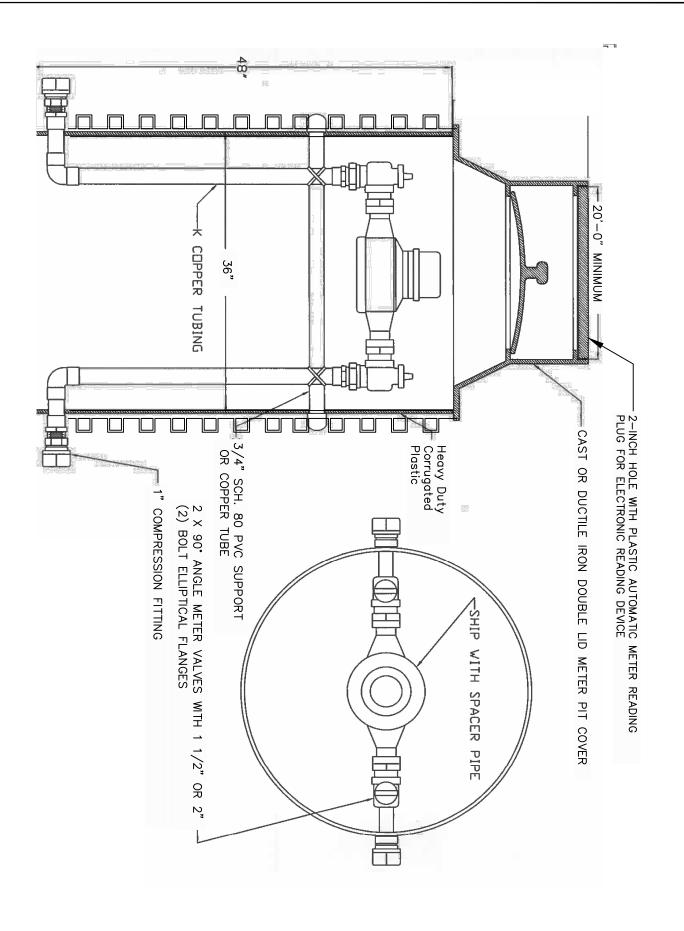
SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-11.2	REV. DATE	
		6/18/08 MAB	
	<u>WATER_METER</u>		
	<u>SEALING DETAIL</u>		
	SCALE: NTS		

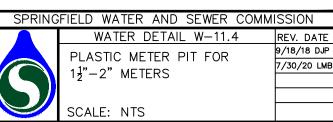


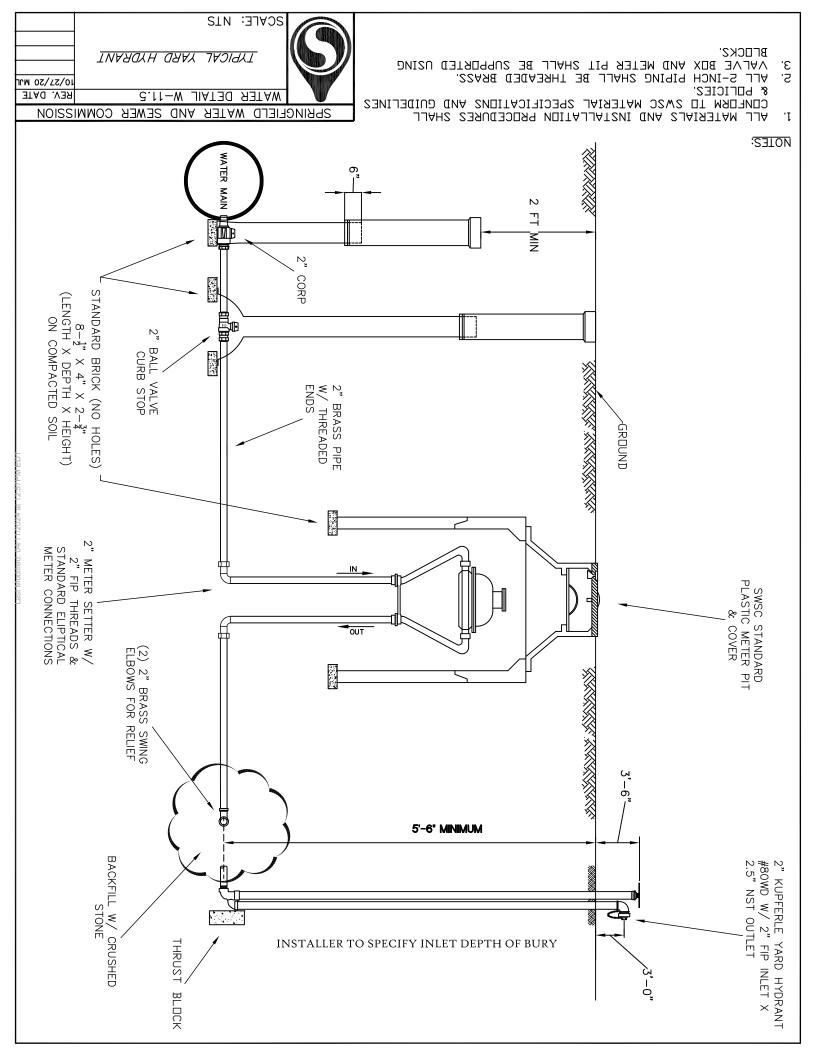


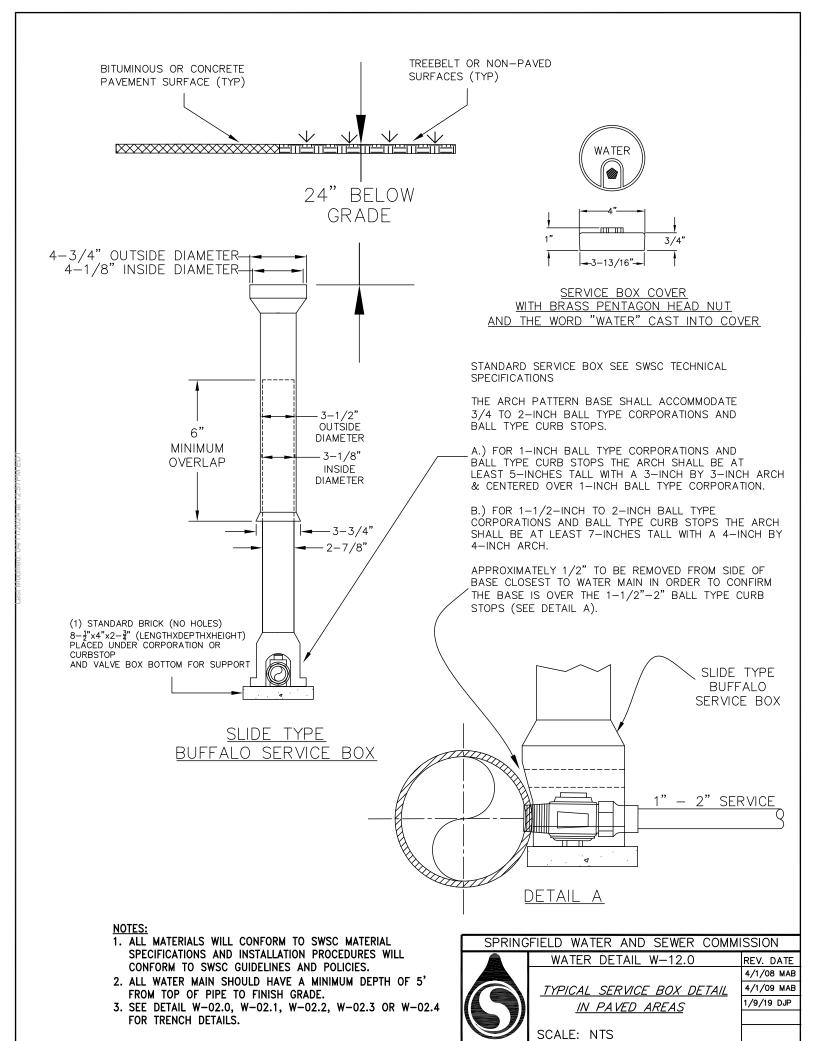
PLASTIC METER PIT FOR §"-1" METERS

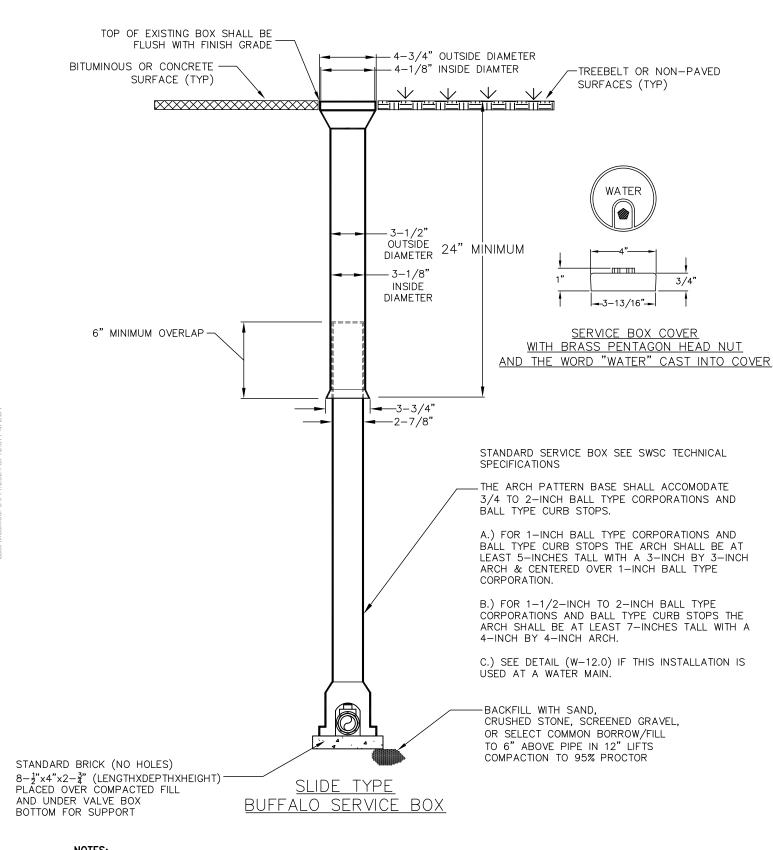
9/18/18 DJP 7/30/20 LMB





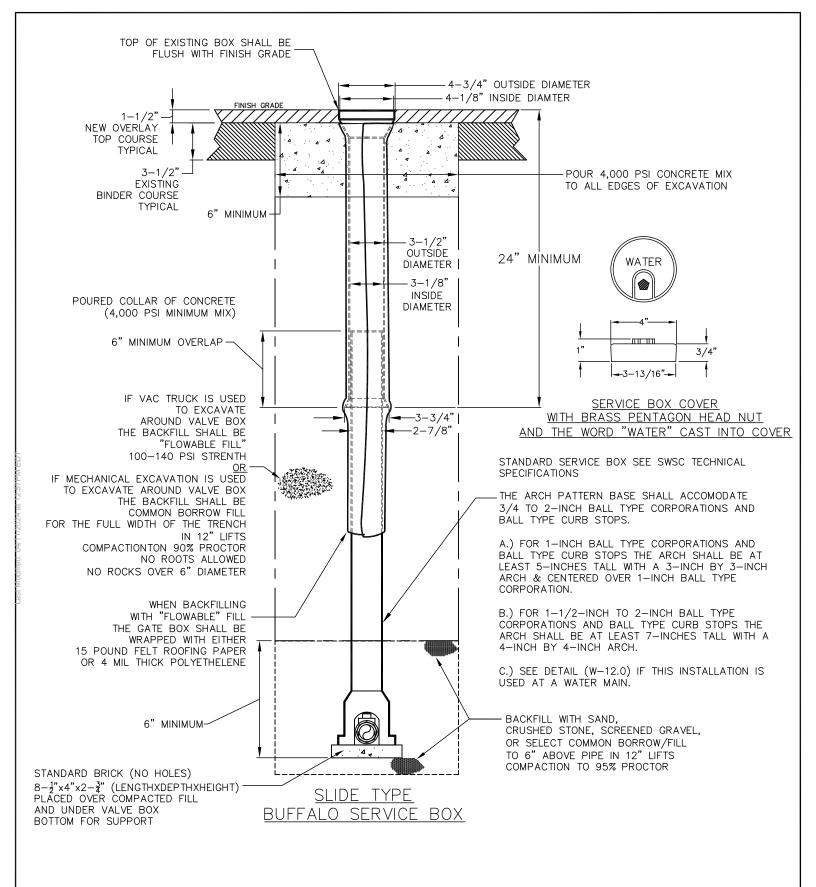






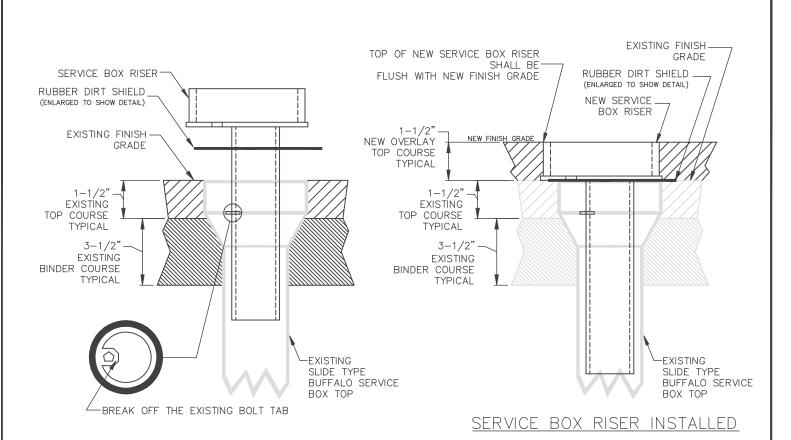
- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- 3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
- 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.

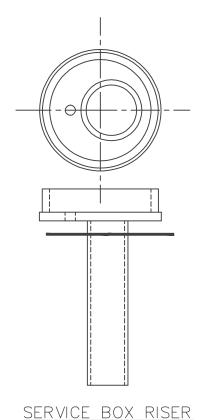
SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-12.1 REV. DATE 4/1/08 MAB TYPICAL SERVICE BOX DETAIL 4/1/09 MAB IN NON-PAVED AREAS 4/1/10 MAB 1/9/19 DJP



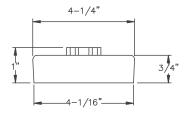
- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-12.2 REV. DATE 4/1/09 MAB REPLACE, RAISE OR RESET SERVICE BOX SCALE: NTS





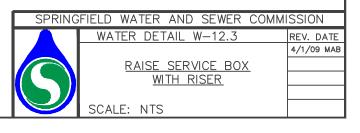


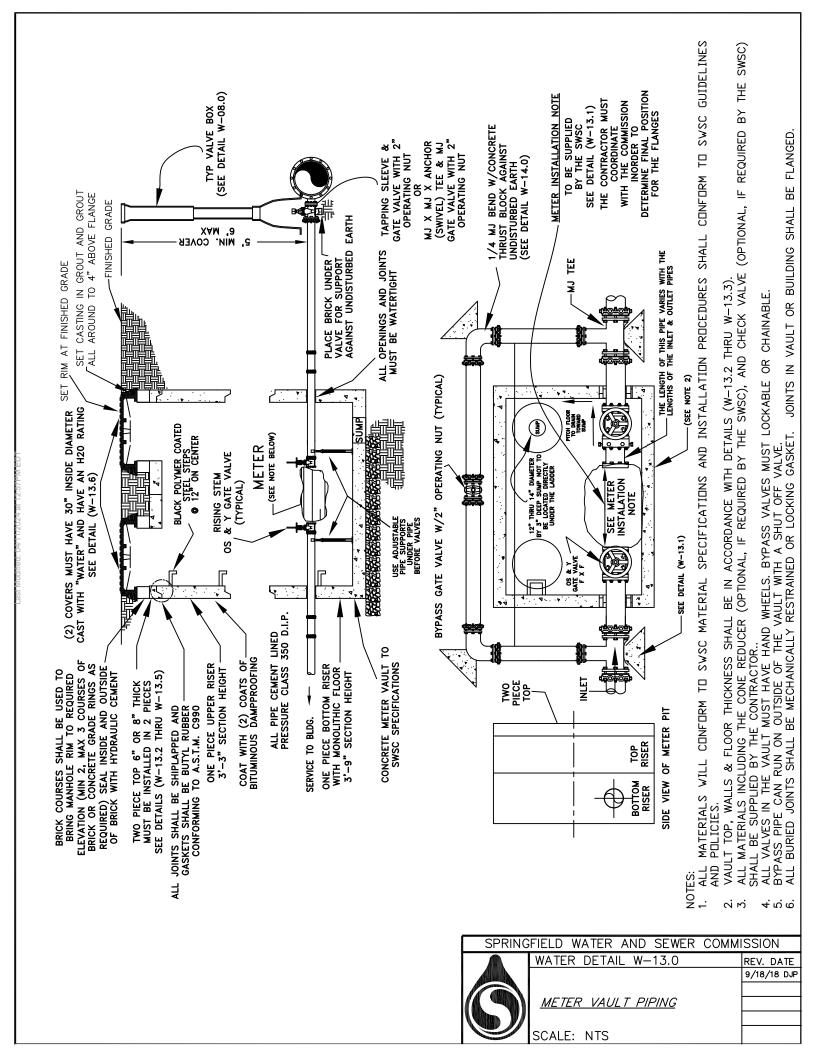


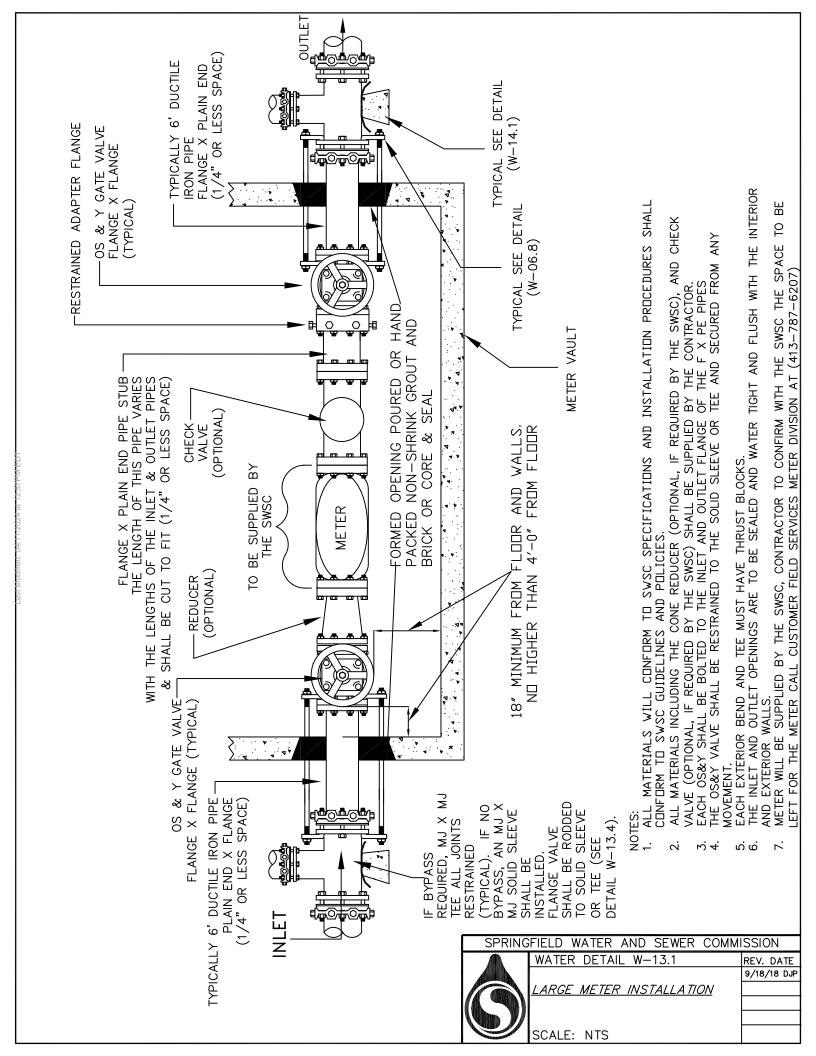
SERVICE BOX RISER COVER
WITH BRASS PENTAGON HEAD NUT
AND THE WORD "WATER" CAST INTO COVER

NOTES:

 ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.





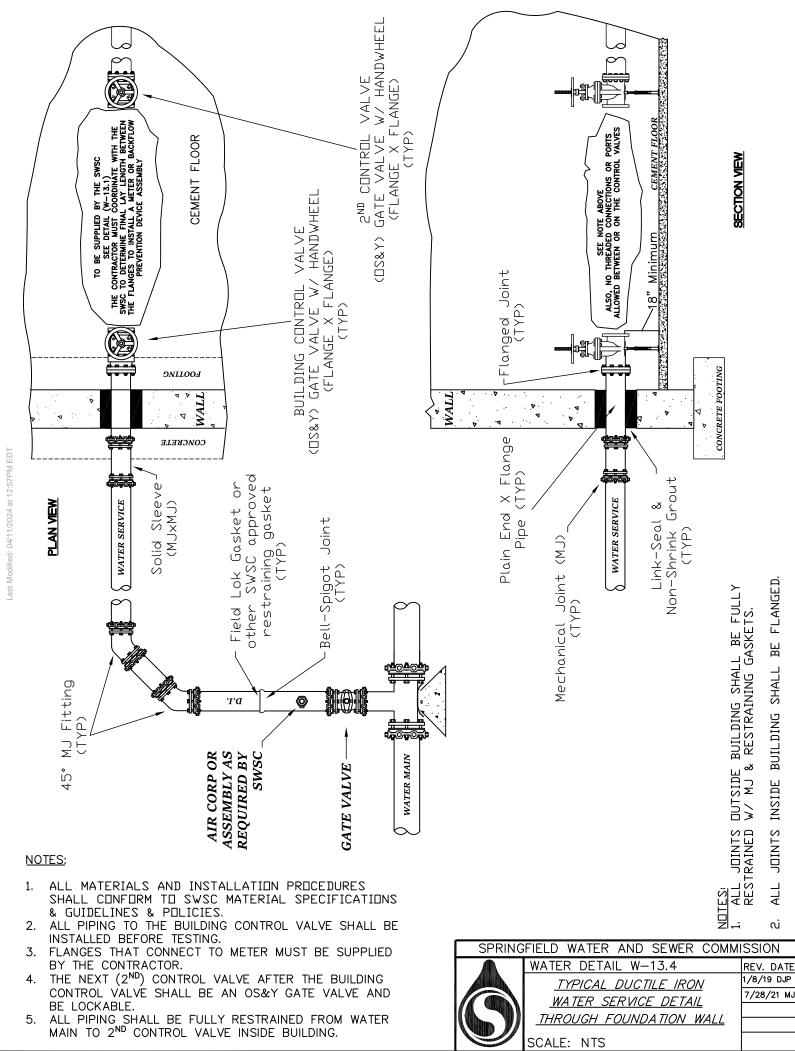


- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W-13.2 - W-13.5)
- (W-13.2-W-13.5). 3. FORMED HOLES SHALL BE TAPPERED TOWARD THE INSIDE OF VAULT.
- 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

- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W-13.2 - W-13.5)
- (W-13.2 W-13.5). 3. FORMED HOLES SHALL BE TAPPERED TOWARD THE INSIDE OF VAULT.
- 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 REV. DATE 4/1/08 MAB OVERSIZED METER VAULT FOR DUCTILE IRON WATER SERVICE PIPE SCALE: NTS



5.

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WATER DETAIL W-13.4 DUCTILE IRON **TYPICAL** WATER SERVICE DETAIL *THROUGH*

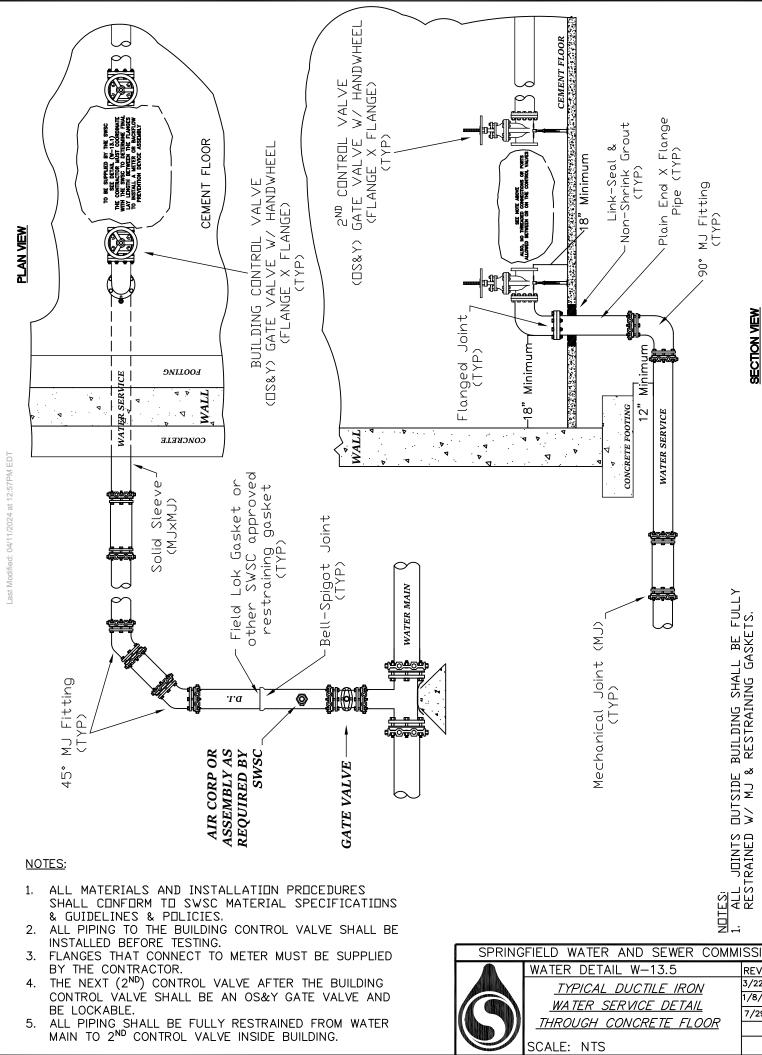
FOUNDATION WALL

JOINTS INSIDE BUILDING SHALL BE FLANGED.

ALL

1/8/19 DJP

7/28/21 MJL



5.

ิด่ COMMISSION DETAIL W-13.5 REV. DATE

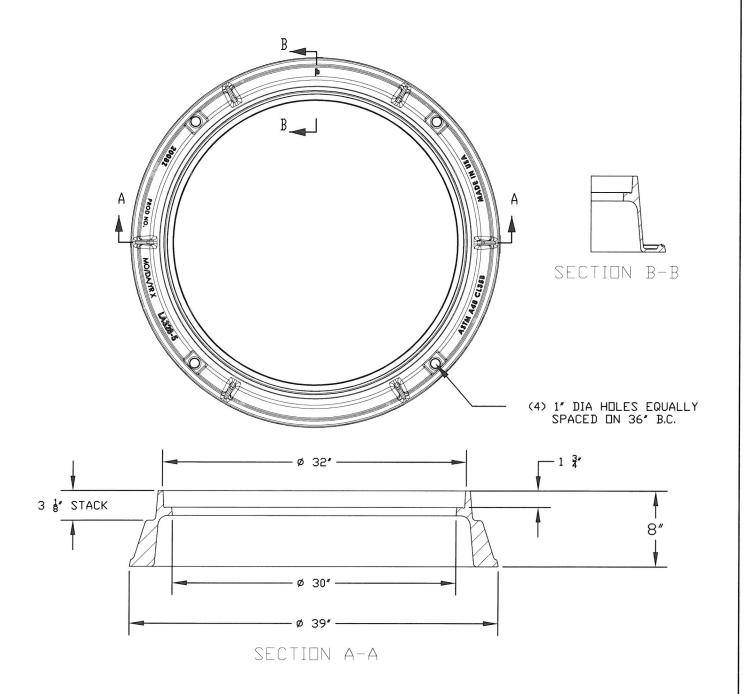
DUCTILE IRON **TYPICAL** WATER SERVICE DETAIL **THROUGH** CONCRETE FLOOR

SCALE:

NTS

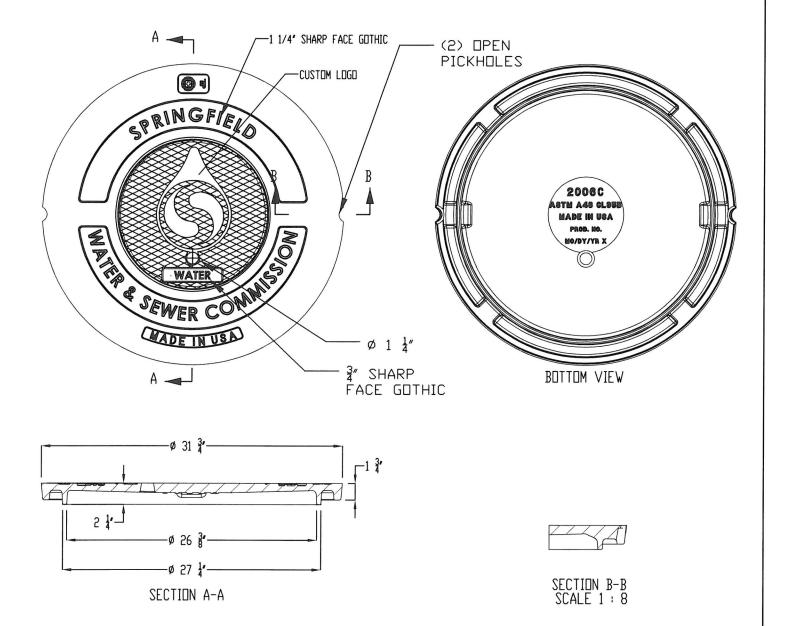
3/22/17 LMB 1/8/19 DJP 7/29/21 MJL

ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.



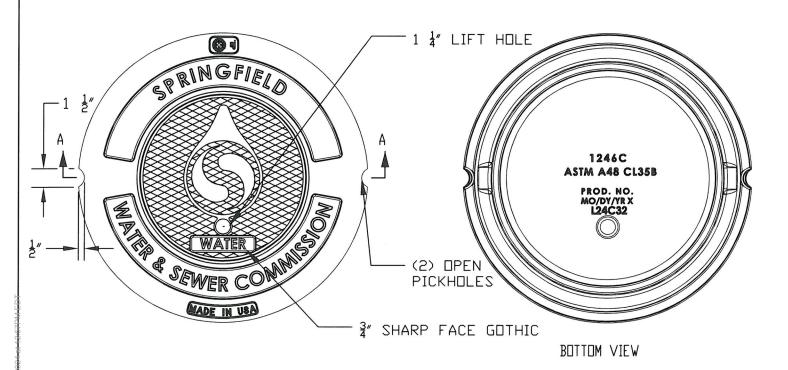
- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 16 ON ALL DIMENSIONS UP TO 12' AND AN ADDITIONAL +/- 16' PER FOOT

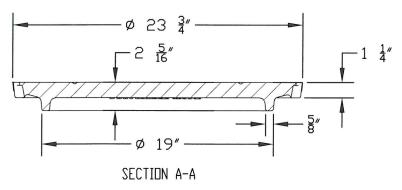
SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-13.6 REV. DATE 4/16/19 DJP 32-inch by 8-inch Frame Only SCALE: NTS



- 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 +/- 16 ON ALL DIMENSIONS UP TO 12' AND AN ADDITIONAL +/- 16' PER FOOT

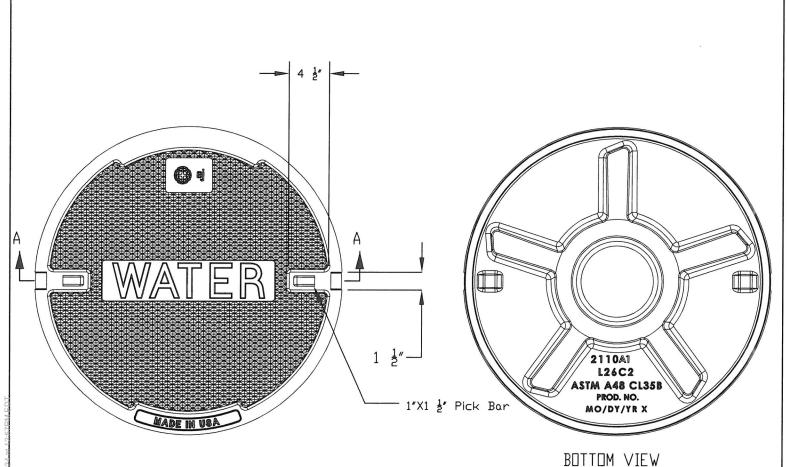
SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-13.7 REV. DATE 32-inch Standard Water Cover SCALE: NTS

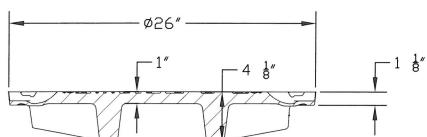




- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12' AND AN ADDITIONAL +/- $\frac{1}{16}$ ' PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.8	REV. DATE
	24-inch Replacement Water Cover SCALE: NTS	4/16/19 DJP

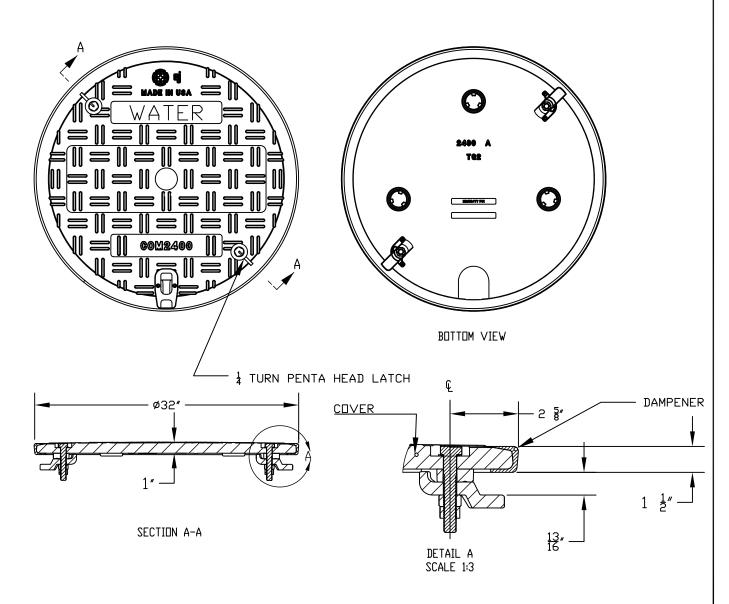




SECTION A-A

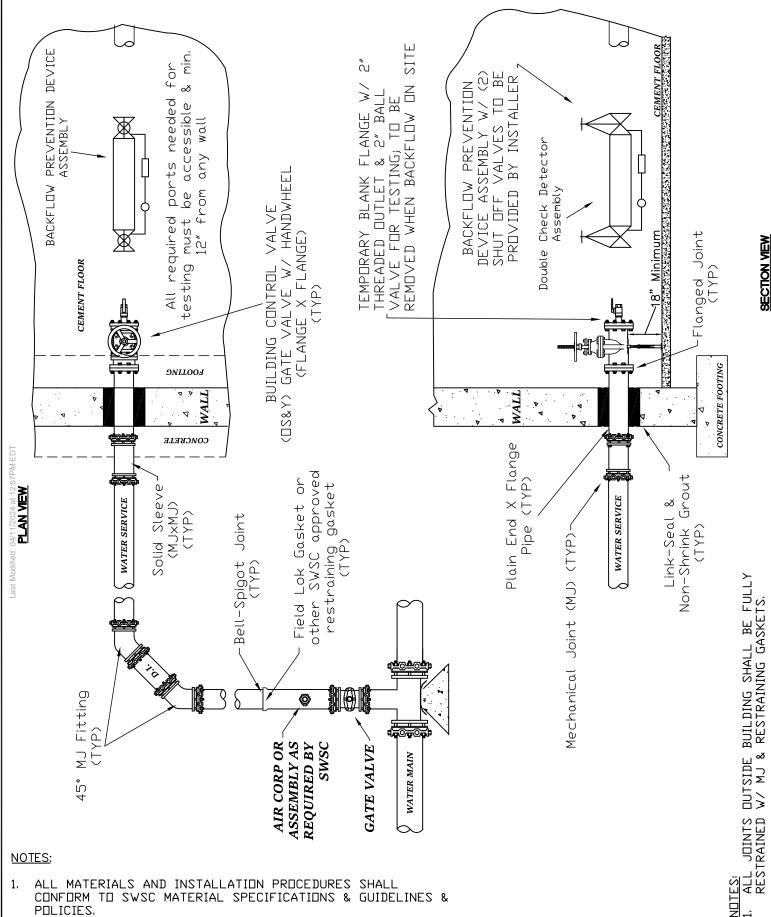
- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 16 ON ALL DIMENSIONS UP TO 12' AND AN ADDITIONAL +/- 16' PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-13.9 REV. DATE 26-inch Replacement Water Cover SCALE: NTS



- 1. ALL MATERIALS WILL CONFORM TO SWSC
 SPECIFICATIONS AND INSTALLATION PROCEDURES
 SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- 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 +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- $\frac{1}{16}$ " PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-13.10	REV. DATE	
	32" Composite Locking	4/19/19 DJP	
	Cover	4/6/21 MJL	
	Cover		
	SCALE: NTS		



- VALVE SHALL BE INSTALLED
- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.

 ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLE BEFORE TESTING.

 BACKFLOW PREVENTION DEVICE ASSEMBLY SHALL BE INSTALLED ONTO OS&Y BUILDING CONTROL VALVE.

 ALL VALVES AFTER THE BUILDING CONTROL VALVE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.

 ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS AFTER BUILDING CONTROL VALVE ARE ALLOWED.
- BUILDING CONTROL VALVE ARE ALLOWED

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-13.11 DUCTILE IRON **TYPICAL** FIRE SERVICE DETAIL **THROUGH** FOUNDATION WALL

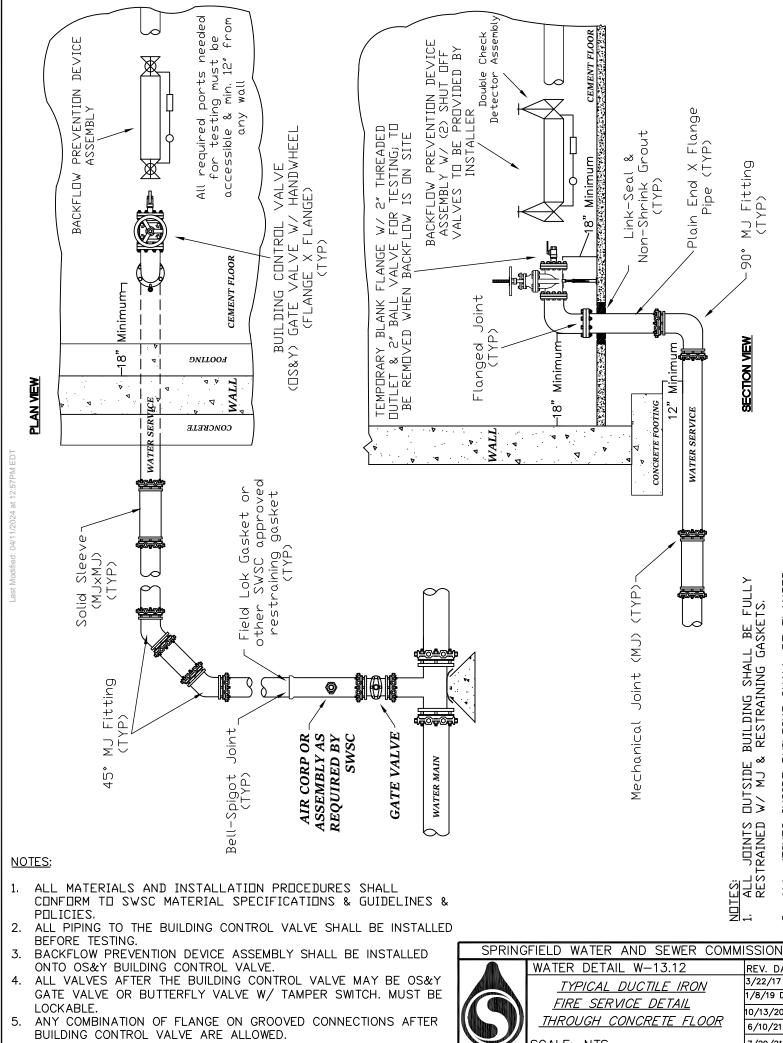
NTS

SCALE:

REV. DATE 1/8/19 DJP 10/6/20 MAB 10/13/20 MJ 6/10/21 MJL 7/28/21 MJL

JOINTS INSIDE BUILDING SHALL BE FLANGED,

ALL



DUCTILE IRON **TYPICAL** FIRE SERVICE DETAIL THROUGH CONCRETE FLOOR

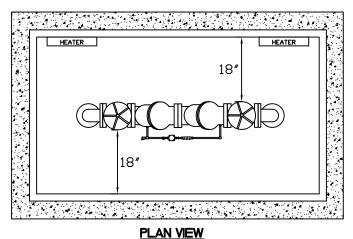
DATE 3/22/17 LME 1/8/19 DJP 10/13/20 MJ 6/10/21 MJL 7/29/21 MJL

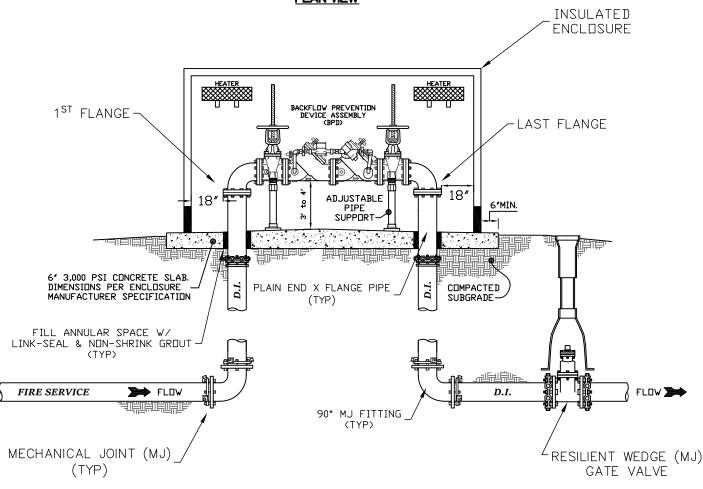
JOINTS INSIDE BUILDING SHALL BE FLANGED,

ALL

SCALE: NTS

BUILDING CONTROL VALVE ARE ALLOWED





SECTION VIEW

NOTES:

- 1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
- 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.
- 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.

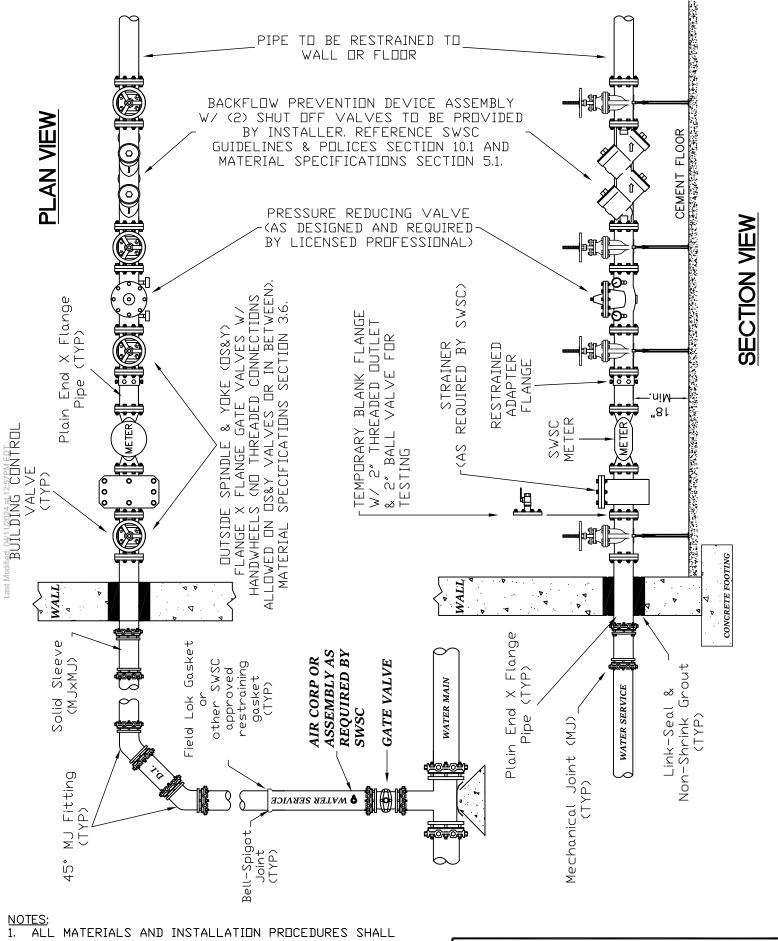
SPRINGFIELD WATER AND SEWER COMMISSION



WATER DETAIL W-13.13

TYPICAL DUCTILE IRON
FIRE SERVICE DETAIL
IN A HOT BOX

REV. DATE 10/28/20 MJL 10/29/20 DS 8/2/21 MJL

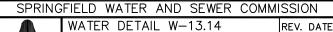


- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.

 ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.

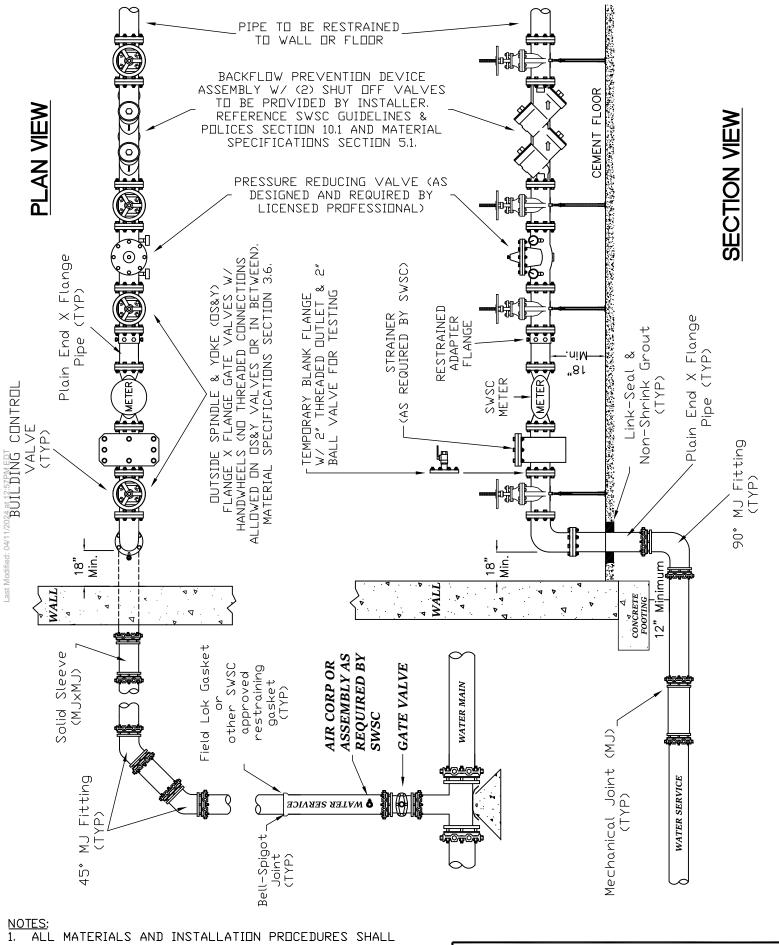
 ALL PIPING SHALL BE FULLY RESTRAINED FROM MAIN TO INSIDE BUILDING.

- ALL JOINTS INSIDE BUILDING SHALL BE FLANGE.



<u>DIP</u> COMMERCIAL INDUSTRIAL SERVICE DETAIL **THROUGH** FOUNDATION WALL

10/28/20 DS 11/5/20 DS 7/28/21 MJL

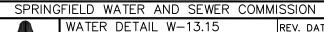


- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.

 ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.

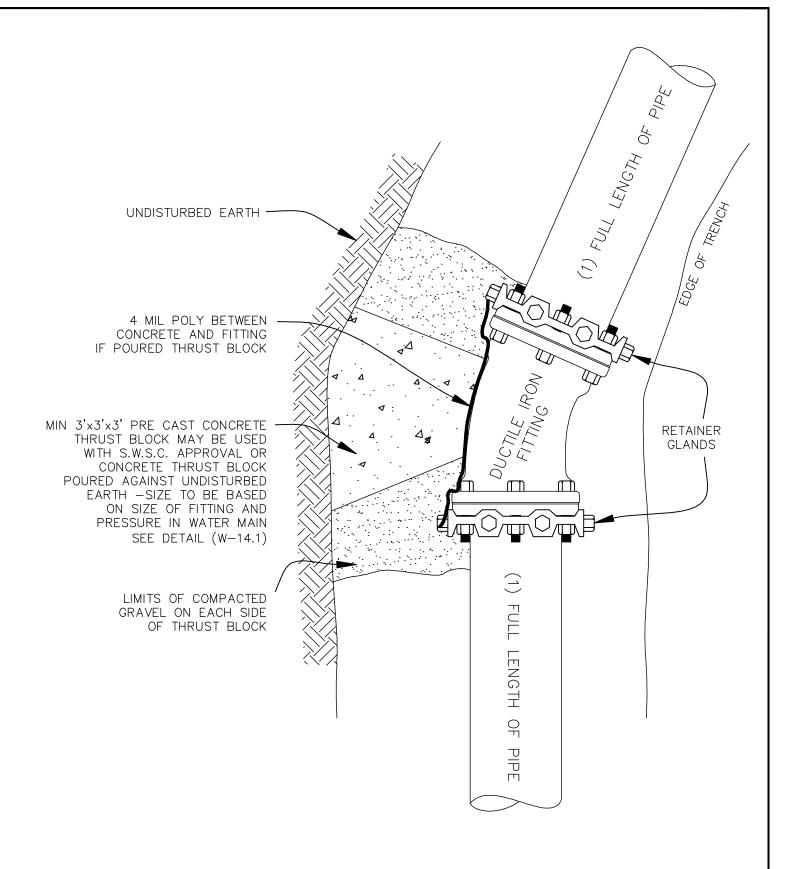
 ALL PIPING SHALL BE FULLY RESTRAINED FROM MAIN TO INSIDE BUILDING.

- JDINTS INSIDE BUILDING SHALL BE FLANGE.



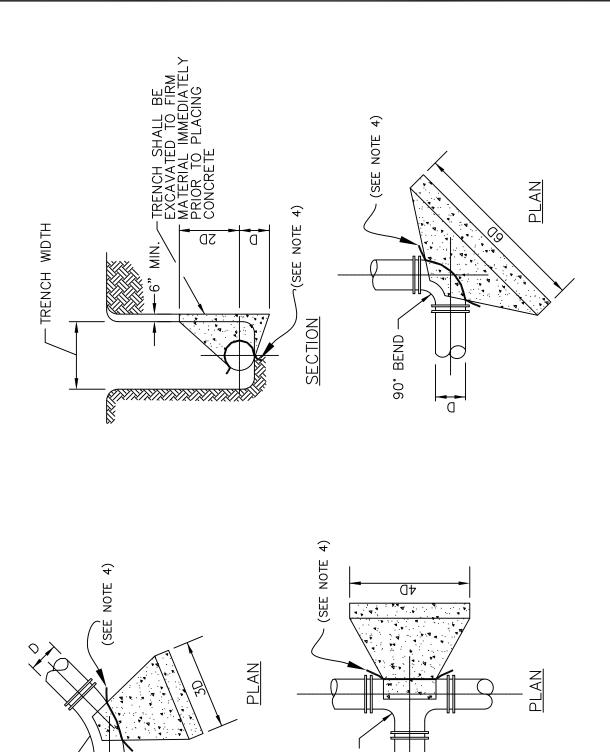


REV. DATE 10/29/20 DS COMMERCIAL 11/5/20 DS SERVICE DETAIL 7/29/21 MJL CONCRETE



- 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		



3-WAY TEE

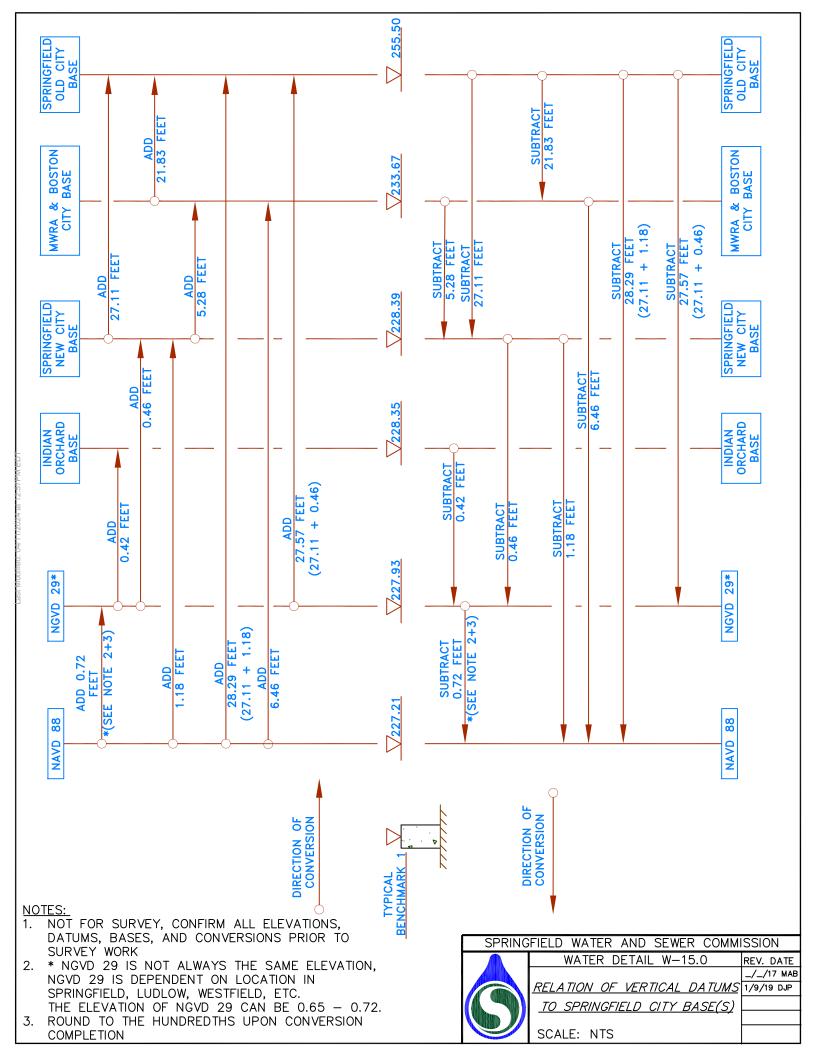
22.5° OR 45° BEND-

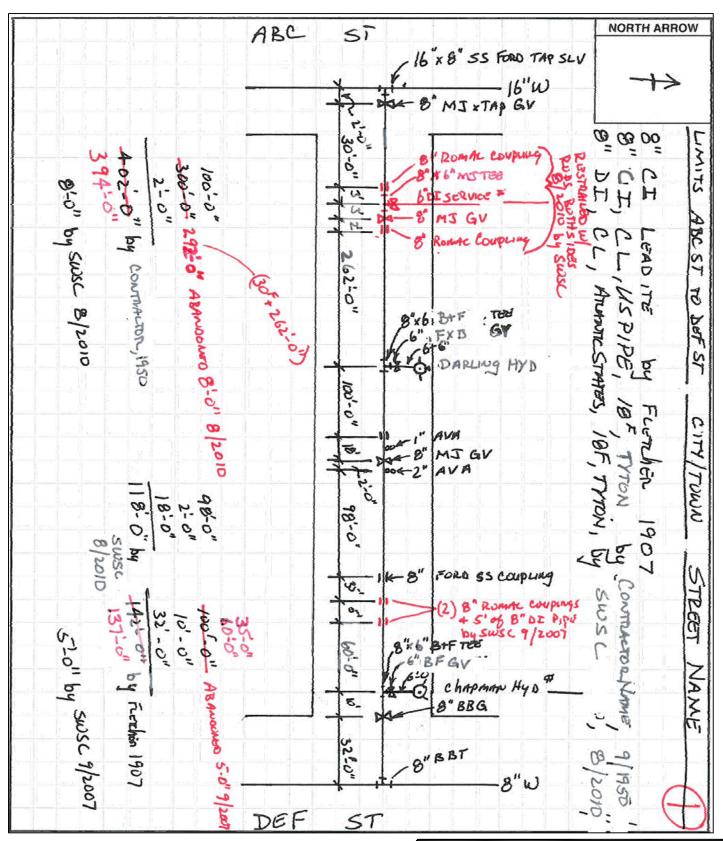
ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES. NOTES:

27.4.60

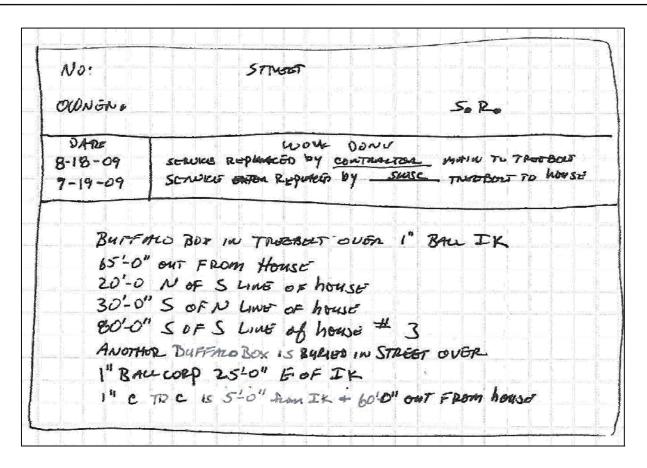
ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS. 4 MIL POLY BETWEEN CONCRETE AND FITTING IF POURED THRUST BLOCK. ANCHORS BASED ON MAXIMUM ALLOWABLE WATER PRESSURE OF 125 PSI SHOULD ONLY BE USED WHEN SOIL CONDITIONS ARE STABLE

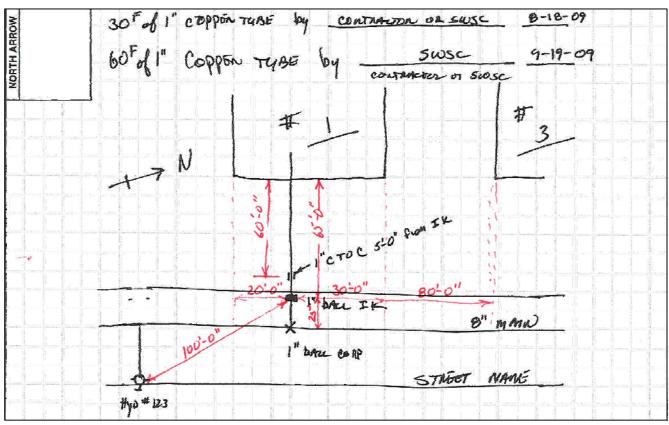
WATER SPRINGFIELD AND SEWER COMMISSION WATER DETAIL W-14.1 REV. DATE 4/1/08 MAB 11/21/19 JFC THRUST BLOCKS SCALE: NTS





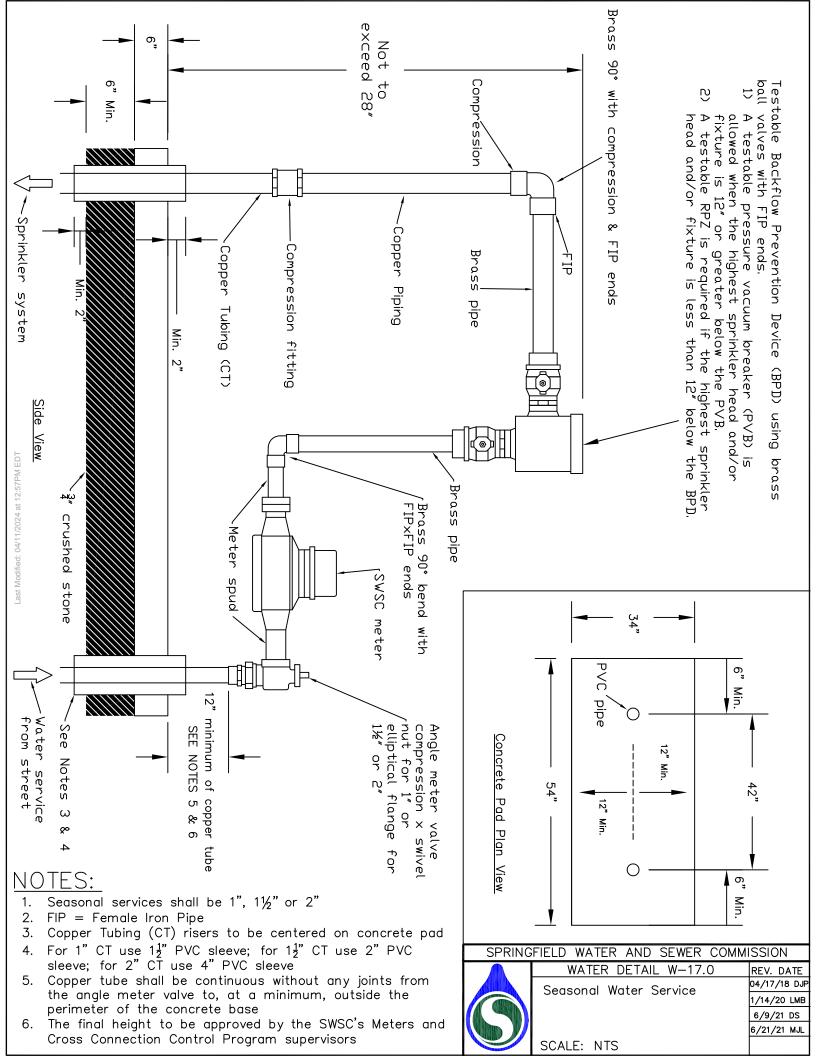
SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-16.0	REV. DATE	
		10/19/17 DJP	
	DECORD OVETOU DETAIL		
	<u>RECORD SKETCH DETAIL</u>		
	SCALE: NTS		

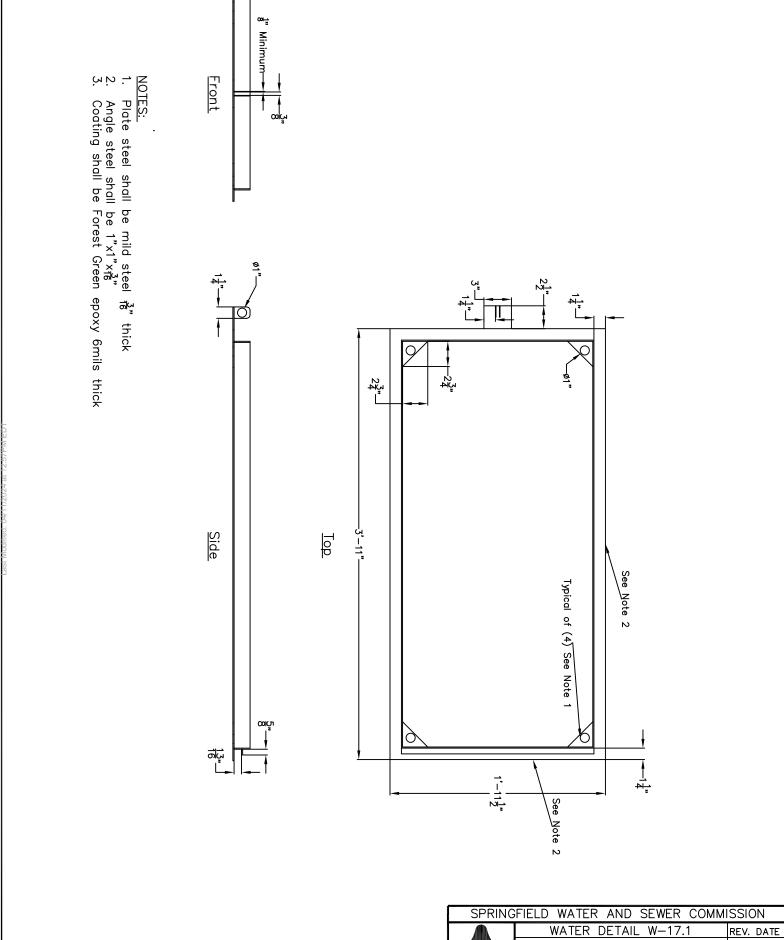




NOTES: 1.

SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-16.1	REV. DATE	
		10/19/17 DJP	
	<u>WATER SERVICES CARD DETAIL</u>		
	SCALE: NTS		



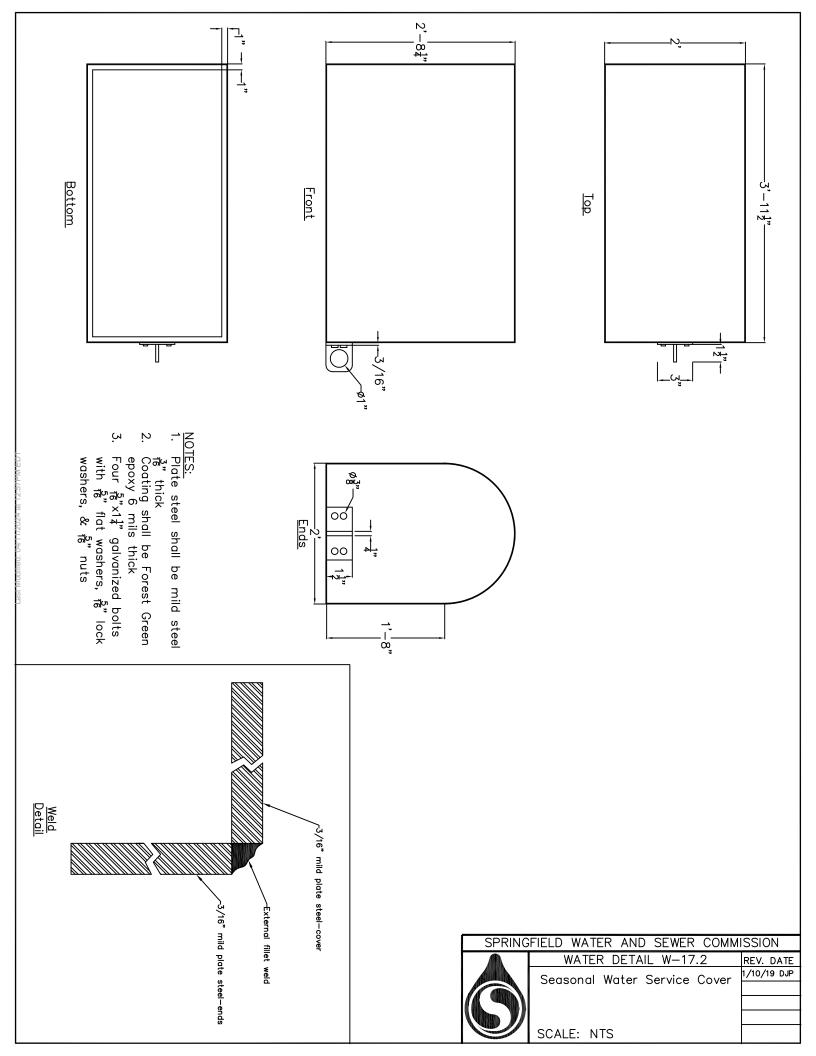


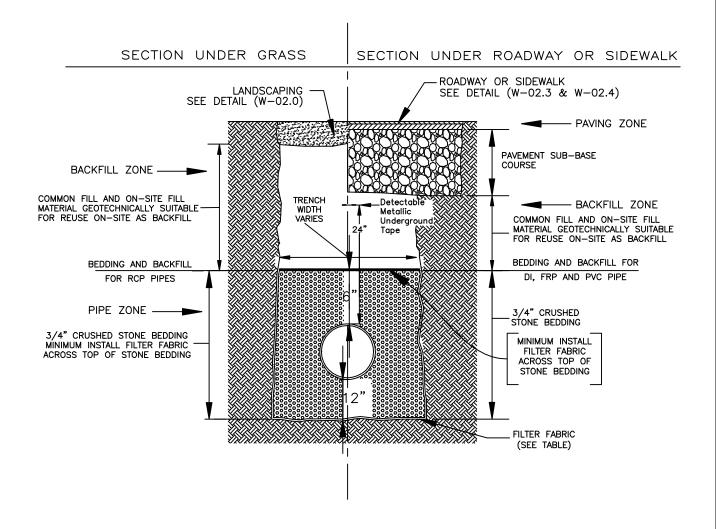
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-17.1 REV. DATE

Seasonal Water Service Base 04/17/18 DJP
01/9/19 LMB
1/10/19 DJP

SCALE: NTS





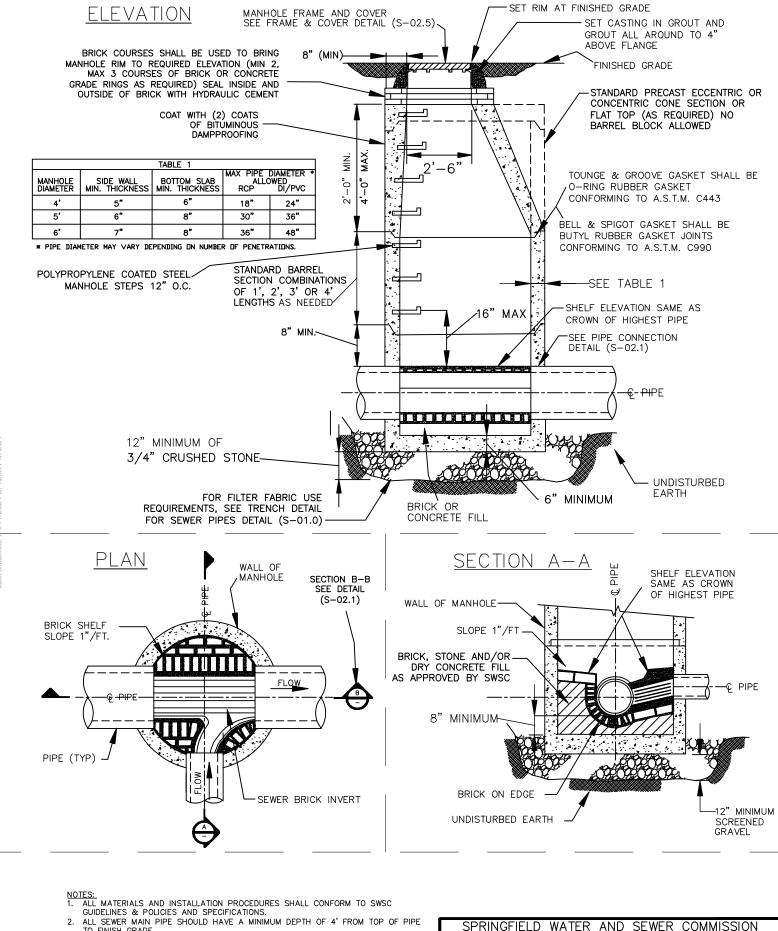
TOTAL STONE BEDDING WRAP FILTER FABRIC REQUIREMENT

	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 MINIMU	M 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.
- 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	REV. DATE	
		4/1/08 MAB	
	TRENCH DETAIL		
	FOR SEWER PIPES		
	SCALE: NTS		



- TO FINISH GRADE.

- TO FINISH GRADE.

 IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.

 REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.

 DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.

 PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.

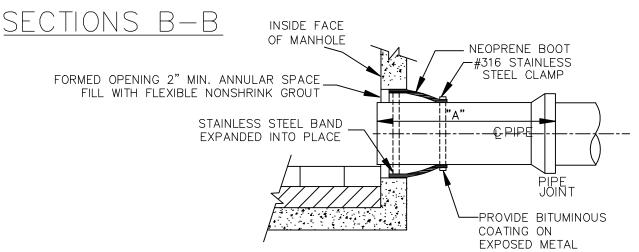
 ALL BRICK SHALL BE HARD NON-POROUS CLAY.

 ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.

 REINFORCING PER ASTM A615 FOR WIRE FABRIC.

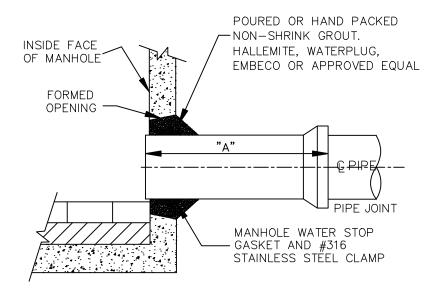
 DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.0	REV. DATE
		4/1/08 MAB
	PRE-CAST CONCRETE	
	SEWER MANHOLE	
	SEWER WINTINEE	
	SCALE: NTS	



MAXIMUM	STUB L	ENGTH
PIPE	"A"	"A"
MATERIAL	(MAX.)	(MIN.)
RC	4'-0"	2'-0"
PVC	3'-3"	2'-0"
DI	4'-6"	2'-0"

FLEXIBLE MANHOLE SEAL

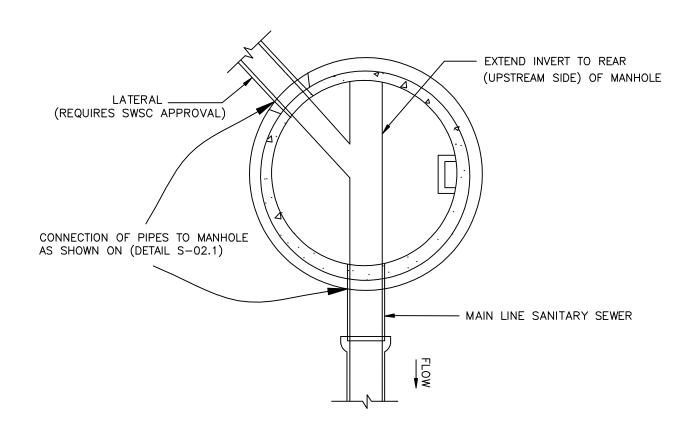


HYDRAULIC CEMENT SEAL*

*THIS METHOD REQUIRES SWSC APPROVAL

- 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.
- 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

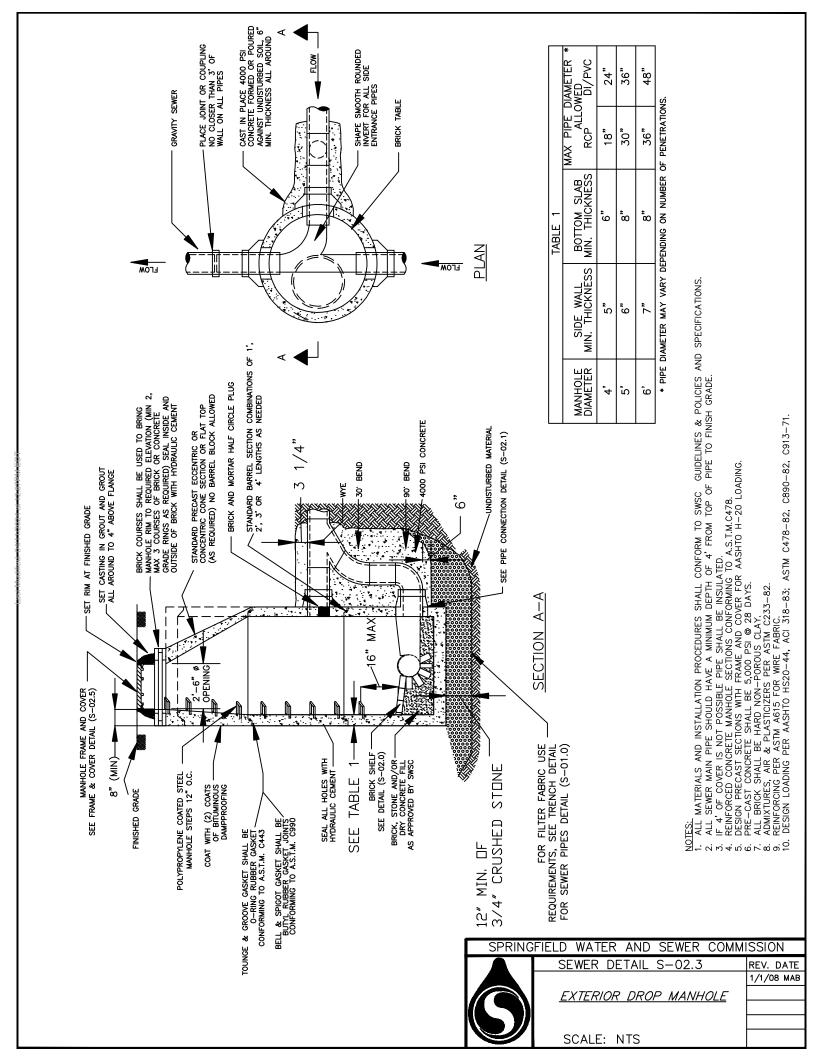
SPRING	ISSION	
	SEWER DETAIL S-02.1	REV. DATE
		4/1/08 MAB
	PRE-CAST CONCRETE SEWER	
	PIPE CONNECTIONS	
	SCALE: NTS	



END MANHOLE

- 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.

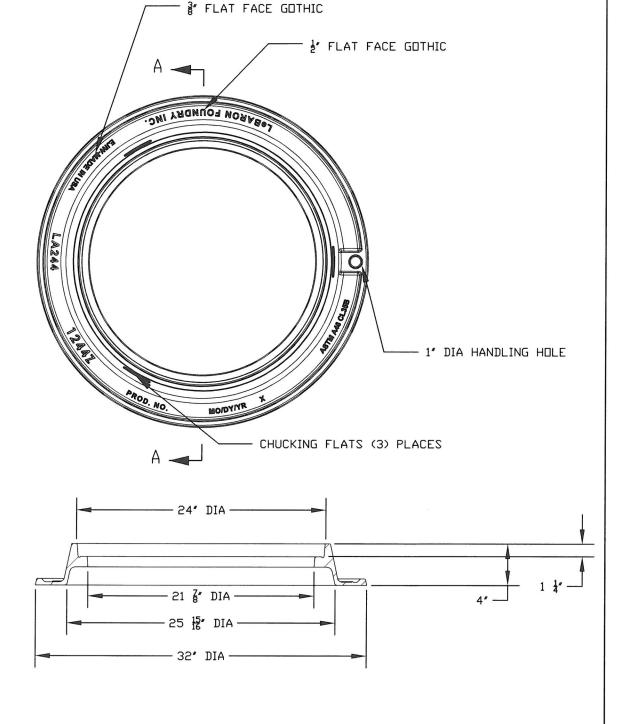
SPRING	FIELD WATER AND SEWER COMM	ISSION
	SEWER DETAIL S-02.2	REV. DATE
		4/1/08 MAB
	END OF SEWER MAIN	
	SCALE: NTS	



- ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.

 IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
 REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
 DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
 PRE-CAST CONCRETE SHALL BE 5,000 PSI © 28 DAYS.
 ALL BRICK SHALL BE HARD NON-POROUS CLAY.
 ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
 REINFORCING PER ASTM A615 FOR WIRE FABRIC.
 DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SEWER DETAIL S-02.4REV. DATE 4/1/08 MAB 6/18/08 MAB INTERIOR DROP MANHOLE SCALE: NTS

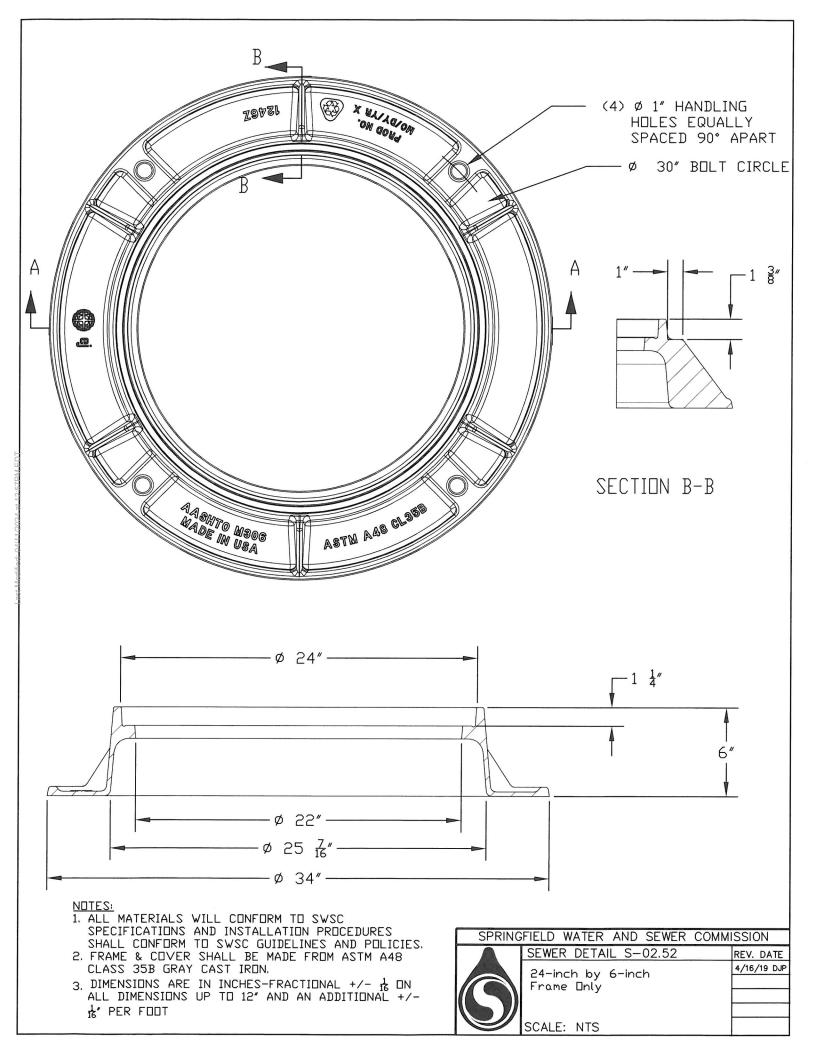


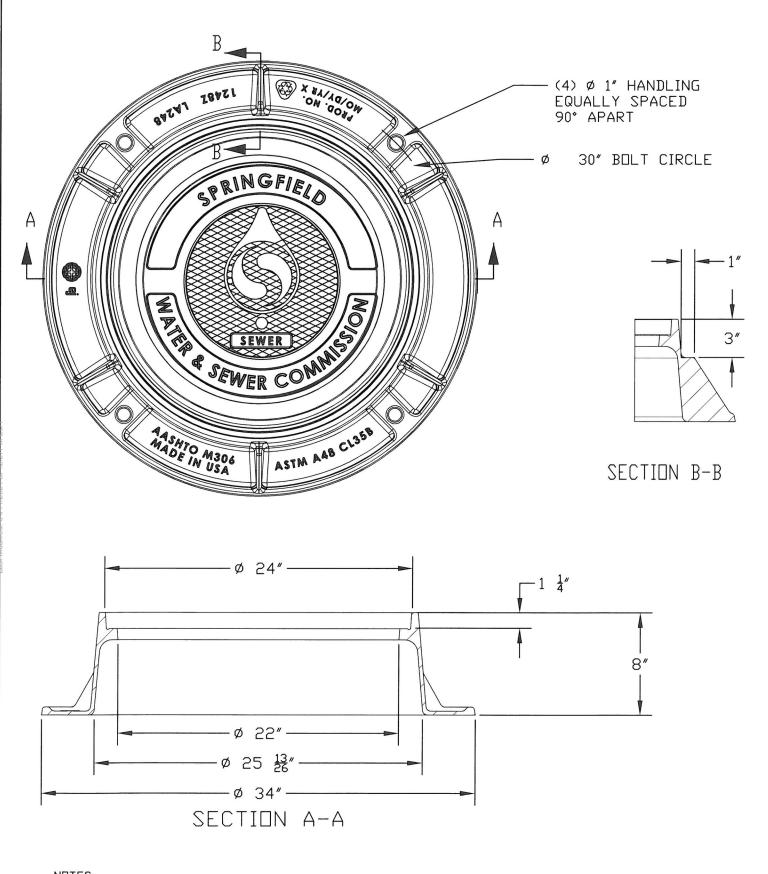
SECTION A-A SCALE 1:10

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 +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/-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

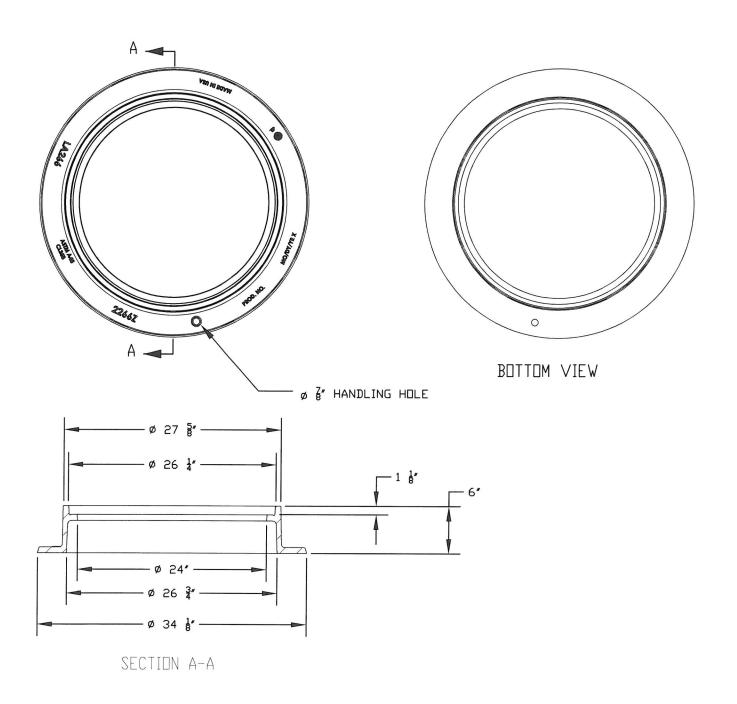




- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES
- SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.

 2. FRAME & COVER SHALL BE MADE FROM ASTM A48
 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/-16" PER FOOT

SPRING	FIELD WATER AND SEWER COMM	ISSION
	SEWER DETAIL S-02.53	REV. DATE
	24-inch by 8-inch Frame Only SCALE: NTS	4/16/19 DJP



- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.

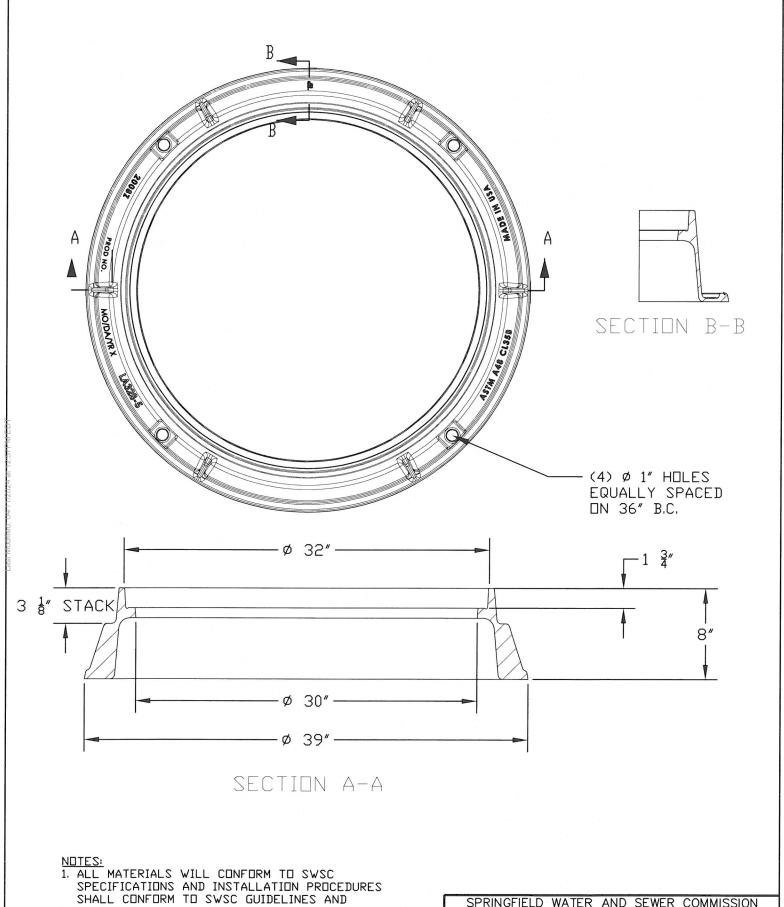
 2. FRAME & COVER SHALL BE MADE FROM ASTM A48
- CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/-16" PER FOOT

0000000		
SPRING	FIELD WATER AND SEWER COMMI	ISSION
	SEWER DETAIL S-02.54	REV. DATE
	26-inch by 6-inch	4/16/19 DJP
	Frame Only	
	-	
	SCALE: NTS	

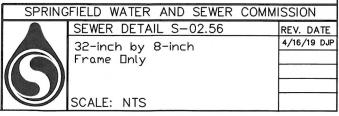
- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.

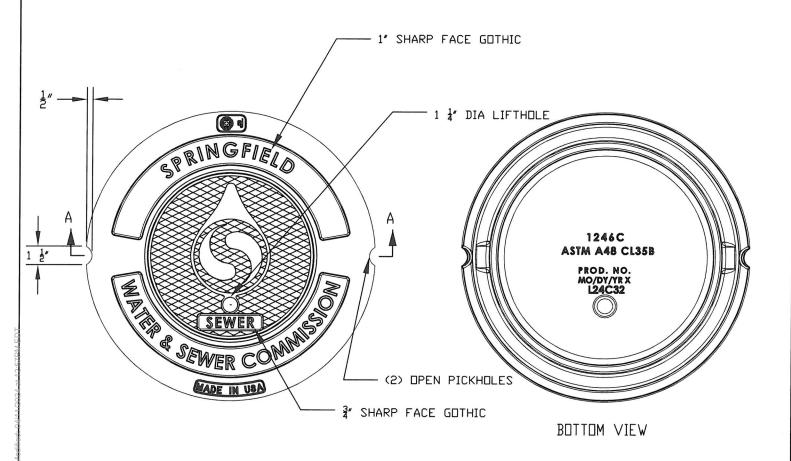
 2. FRAME & COVER SHALL BE MADE FROM ASTM A48
 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- $\frac{1}{16}$ " PER FOOT

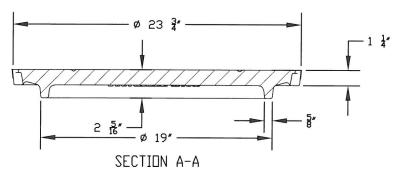
SPRINGFIELD WATER AND SEWER COMMISSION SEWER DETAIL S-02.55 REV. DATE 4/16/19 DJP 32-inch by 6-inch Frame Only SCALE: NTS



- POLICIES.
- 2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{15}$ ON ALL DIMENSIONS UP TO 12' AND AN ADDITIONAL +/- 16" PER FOOT

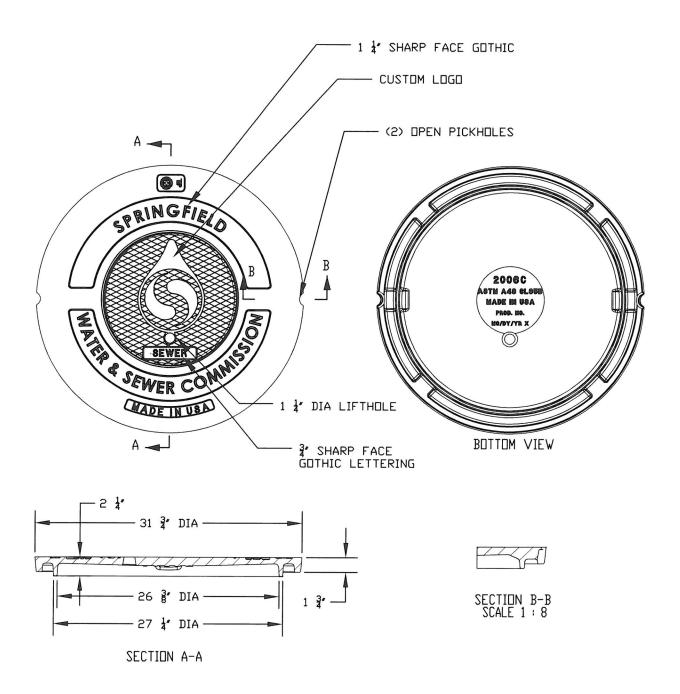






- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
 2. FRAME & COVER SHALL BE MADE FROM ASTM A48
 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- $\frac{1}{16}$ " PER FOOT

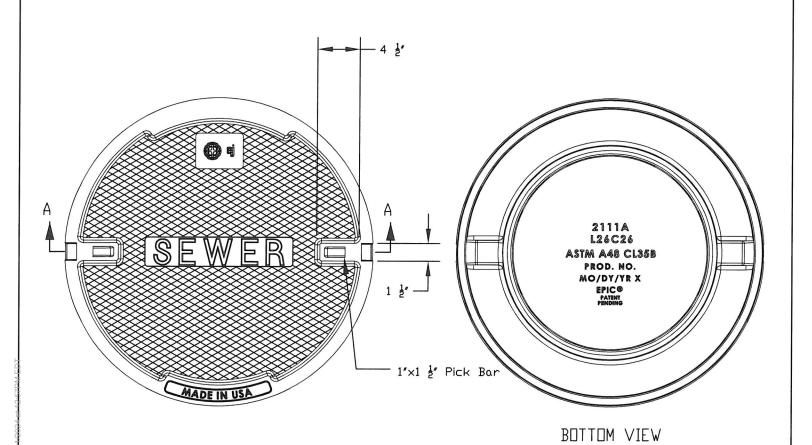
SPRINGFIELD WATER AND SEWER COMMISSION		
SEWER DETAIL S-02.61	REV. DATE	
	4/16/19 DJP	
24—inch Standard Sewer Cover		
SCALE: NTS		
	SEWER DETAIL S-02.61 24-inch Standard Sewer Cover	

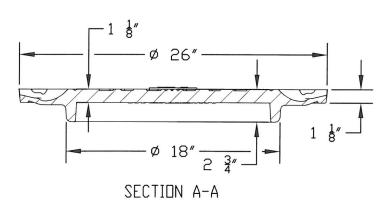


- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.

 2. FRAME & COVER SHALL BE MADE FROM ASTM A48
 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 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	

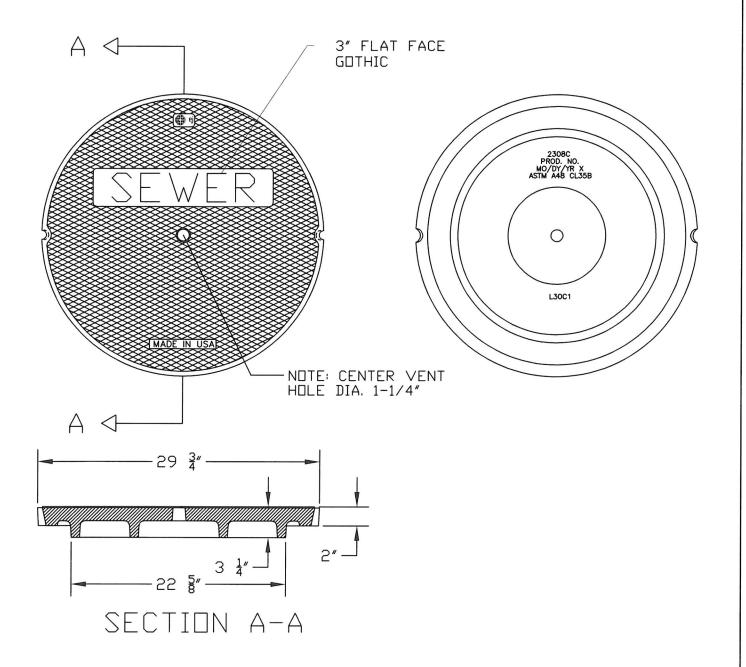




- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES
- SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.

 2. FRAME & COVER SHALL BE MADE FROM ASTM A48
 CLASS 35B GRAY CAST IRON.
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 16" PER FOOT

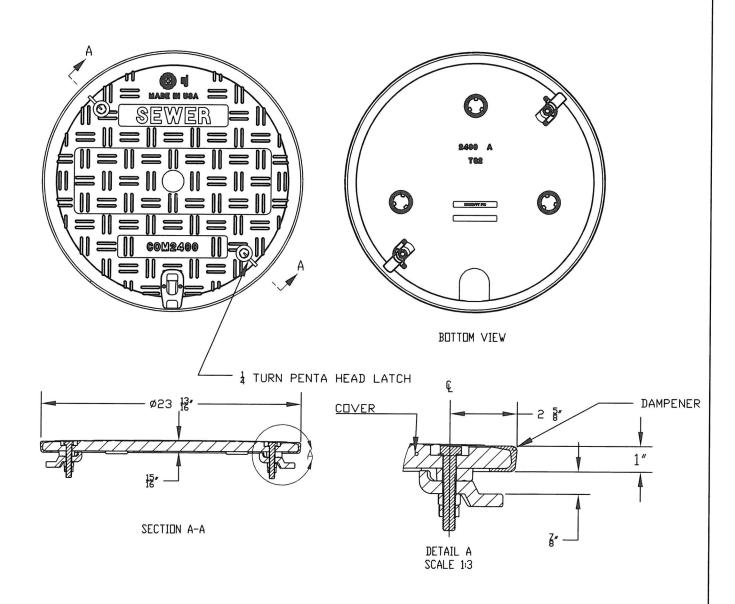
SPRINGFIELD WATER AND SEWER COMMISSION			
	SEWER DETAIL S-02.63	REV. DATE	
	26-inch Replacement Sewer Cover	4/16/19 DJP	
	SCALE: NTS		



- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES
- 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 +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- $\frac{1}{16}$ " PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION			
	SEWER DETAIL S-02.64	REV. DATE	
	30-inch Replacement Sewer	4/16/19 DJP	
	Cover		
	SCALE: NTS		



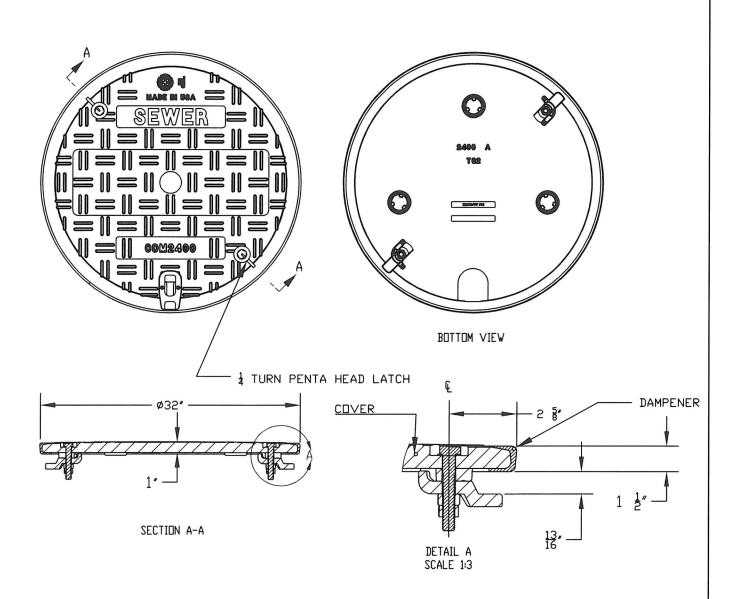
- 1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
 2. COVER SHALL BE MADE FROM FIBER REINFORCED
- POLYMER (FRP) ASTM C1028
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/ig" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION SEWER DETAIL S-02.65 REV. DATE

24" Composite Locking Cover

SCALE: NTS

4/19/19 DJP

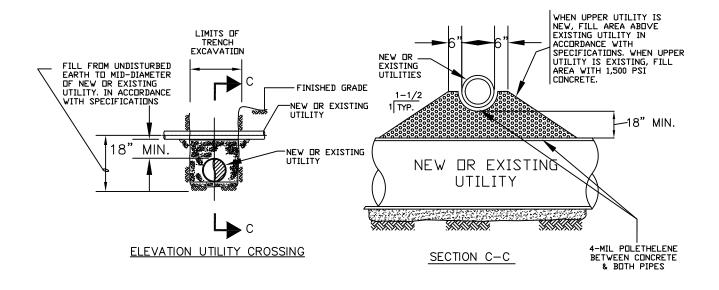


- NOTES:

 1. ALL MATERIALS WILL CONFORM TO SWSC
 SPECIFICATIONS AND INSTALLATION PROCEDURES
 SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.

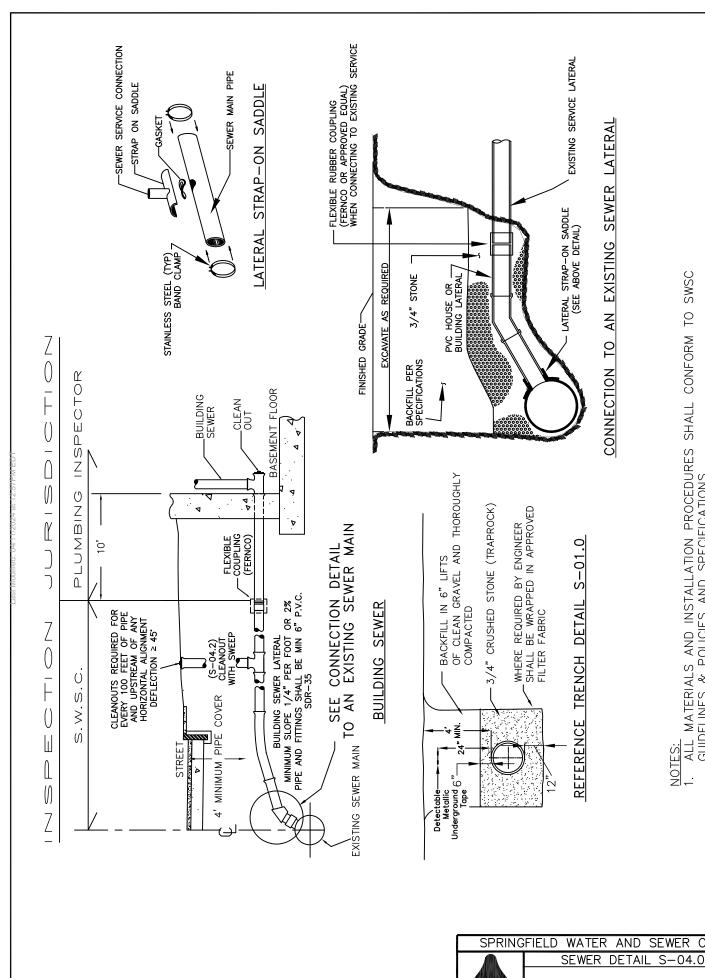
 2. COVER SHALL BE MADE FROM FIBER REINFORCED
 POLYMER (FRP) ASTM C1028
- 3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- $\frac{1}{16}$ ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/-16" PER FOOT

SPRING	FIELD WATER AND SEWER COMMI	SSION
	SEWER DETAIL S-02.66	REV. DATE
	32-inch Composite Locking Cover	4/19/19 DJP
	SCALE: NTS	



- 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.
- IF DEPTH OF COVER ABOVE CONCRETE ENCASEMENT IS GREATER THAN 5'-0" REINFORCEMENT STEEL SHALL BE USED.

SPRING	FIELD WATER AND SEWER COMM	ISSION
	SEWER DETAIL S-03.0	REV. DATE
		4/1/08 MAB
		6/18/08 MAB
	UTILITY CROSSING DETAIL	4/6/21 MJL
	SCALE: NTS	



COMMISSION

EXISTING SEWER MAIN

BUILDING

SCALE: NTS

REV. DATE 4/1/08 MAB

10/6/20 DS

3/17/21 MJI

Б. 4.

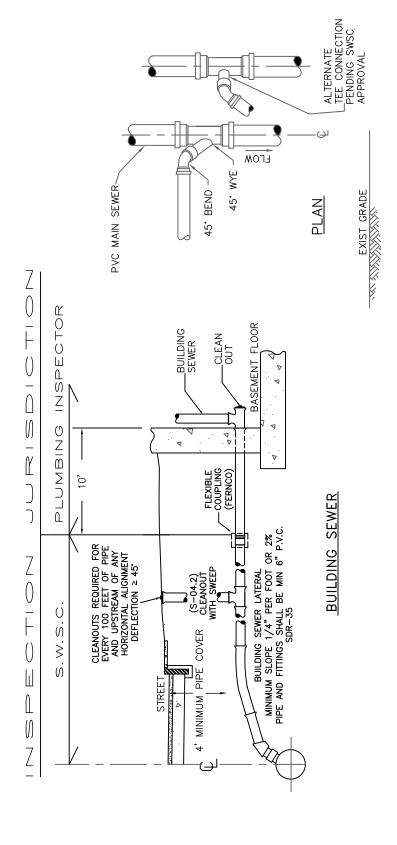
ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS. NOTES:

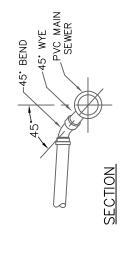
ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.

IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.

ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF DIAMETER, NO EXCEPTIONS.

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OF CLEAN GRAVEL AND THOROUGHLY

COMPACTED

Underground 6"-Tape

Detectable-Metallic

BACKFILL IN 6" LIFTS

3/4" CRUSHED STONE (TRAPROCK)

WHERE REQUIRED BY ENGINEER SHALL BE WRAPPED IN APPROVED FILTER FABRIC

S-01.0

REFERENCE TRENCH DETAIL

LATERAL CONNECTION TO A NEW SEWER MAIN

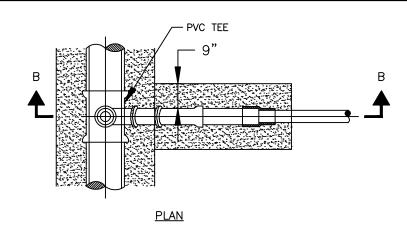
- ઝ ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES POLICIES AND SPECIFICATIONS. NOTES:
 - ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE FINISH GRADE. \vec{c}
- IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
- ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

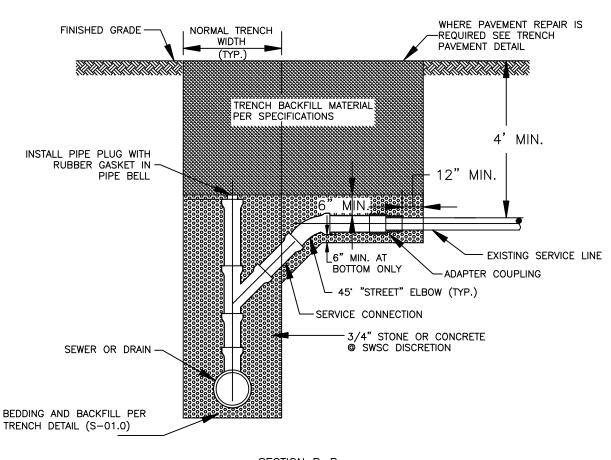
WATER SPRINGFIELD AND SEWER COMMISSION REV. DATE 4/1/08 MAB SEWER DETAIL S-04.1 10/6/20 DS NEW SEWER MAIN 3/17/21 MJL BUILDING CONNECTION SCALE: NTS

* REQUIRED — EVERY 100 FEET OF PIPE AND UPSTREAM OF ANY HORIZONTAL ALIGNMENT DEFLECTION GREATER THAN OR EQUAL TO 45 DEGREES

- 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.
- 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.

SPRING	FIELD WATER AND SEWER COMM	ISSION
	SEWER DETAIL S-04.2	REV. DATE
		4/1/08 MAB
	CLEAN OUT WITH SWEEP	10/06/20 DS
	SCALE: NTS	





SECTION B-B SEWER OR DRAIN SERVICE CONNECTION WITH CHIMNEY GREATER THAN 12' DEEP

- 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		

REQUIREMENTS PER GUIDELINES & POLICIES AND SPECIFICATIONS ALSO SEE DETAIL (S-01.0) ADJUSTED SERVICE THE SAME INSIDE DIAMETER AS EXISTING SERVICE LINE SEWER PIPE MATERIAL WITH LINE (METHOD 1) BEDDING AND BACKFILL STORM SEWER EXISTING SANITARY SEWER SERVICE LATERAL SEWER PIPE MATERIAL WITH THE SAME INSIDE DIAMETER AS EXISTING SERVICE LINE — CLEARANCE 6" MIN. EXISTING OR NEW SANITARY SEWER FINISHED GRADE 6" MIN. CLEARANCE ADJUSTED SERVICE LINE (METHOD 2)

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FINISH GRADE.

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COMMISSION

NOTES:

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ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES POLICIES AND MATERIAL SPECIFICATIONS.

ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE

ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER.

IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.

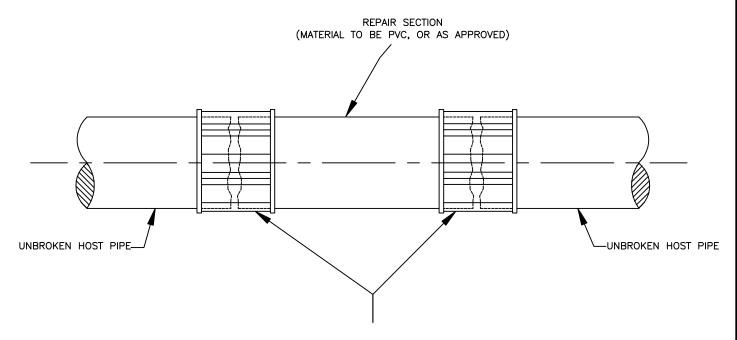
NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER SEWER DETAIL S-04.4 REV. DATE 4/1/08 MAB

BUILDING CONNECTION TO EWER MAIN WITH CONFLICTS

SCALE: NTS

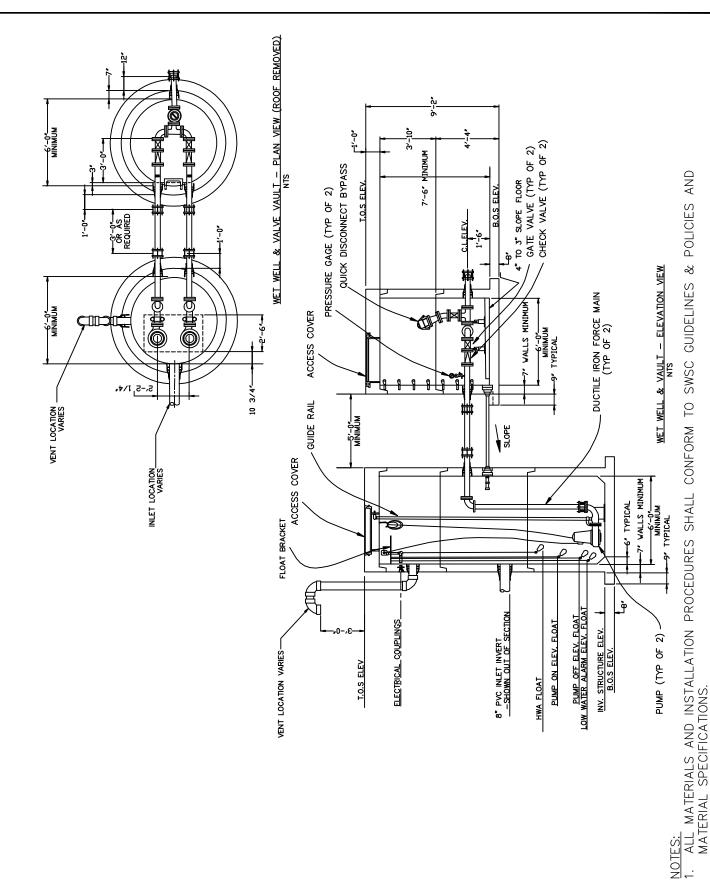
TYPICAL REPAIR



PVC SLIP COUPLINGS, RUBBER COUPLINGS (FERNCO OR APPROVED EQUAL) BRICK OR EGG SHAPED SEWER REPAIR MAY HAVE ADDITIONAL REQUIREMENTS BY SWSC

- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
- ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
- IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
- SEWER REPAIR SECTION MATERIAL SHALL BE THE SAME MATERIAL AS THE HOST PIPE, OR AS APPROVED BY SWSC.
 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		
	<u> </u>		
	SCALE: NTS		



SPRINGFIELD WATER AND SEWER COMMISSION

SEWER DETAIL S-06.0 REV. DATE

4/1/08 MAB

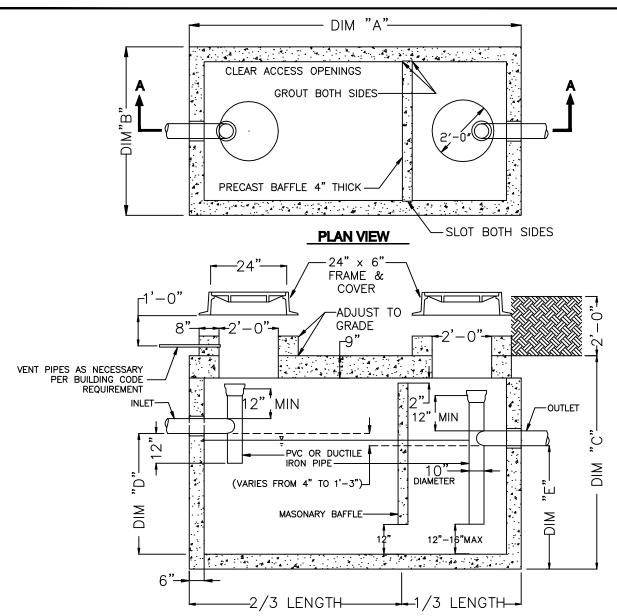
WETWELL & VALVE VAULT

PRECAST

SCALE: NTS

ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.

2 5



SECTION A-A

SIZING CHART						
GALLON CAPATOTTY	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"	

NOTES:

- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
- ALL SEWER SERVICE PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' 2. FROM TOP OF PIPE TO FINISH GRADE.
- IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
- SEWER REPAIR SECTION MATERIAL SHALL BE THE SAME MATERIAL AS 4. THE HOST PIPE, OR AS APPROVED BY SWSC.
- REPAIR SECTION SHALL BE SIZED TO BUTT AGAINST THE HOST PIPES.

GENERAL CONSTRUCTION NOTES:

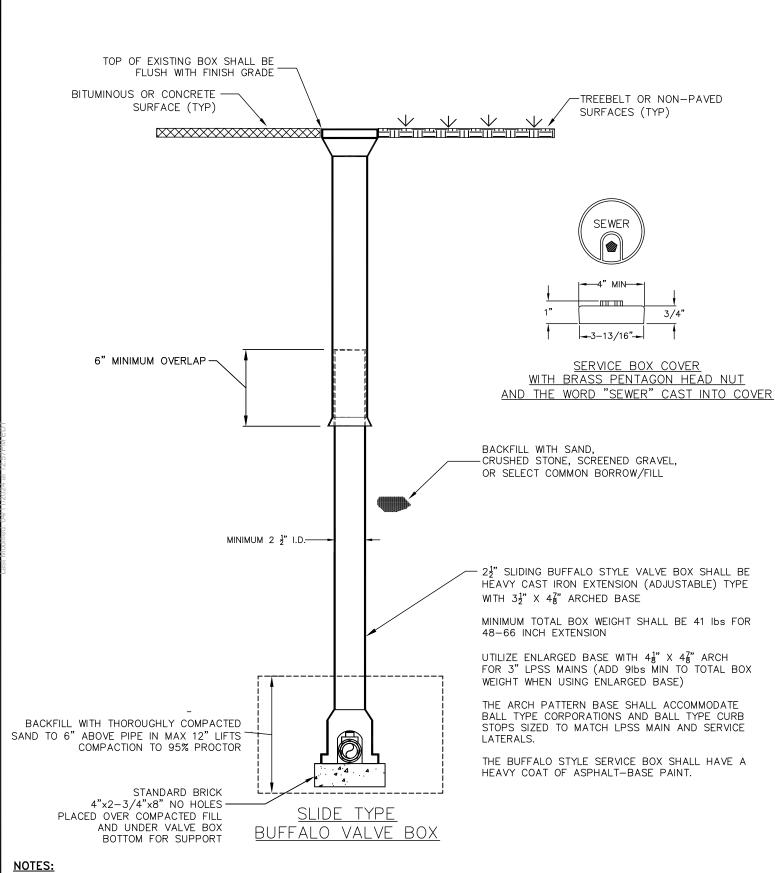
- 1. CONCRETE: 28 DAY F'c= 4500 psi
- REBAR : ASTM A615 GRADE 60.
- MESH: ASTM A-185 GRADE 65
- DESIGN: AC1318-83 BUILDING CODE ASTM C-857 MINIMUM STRUCTURAL DESIGN

LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES

- 5. LOADS :H-20 LOADING.
- FILL w/CLEAN WATER PRIOR TO START UP OF SYSTEM.
- 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.
 GRAY WATER ONLY, BLACK WATER SHALL BE CARRIED BY SEPARATE SEWER.
- 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.

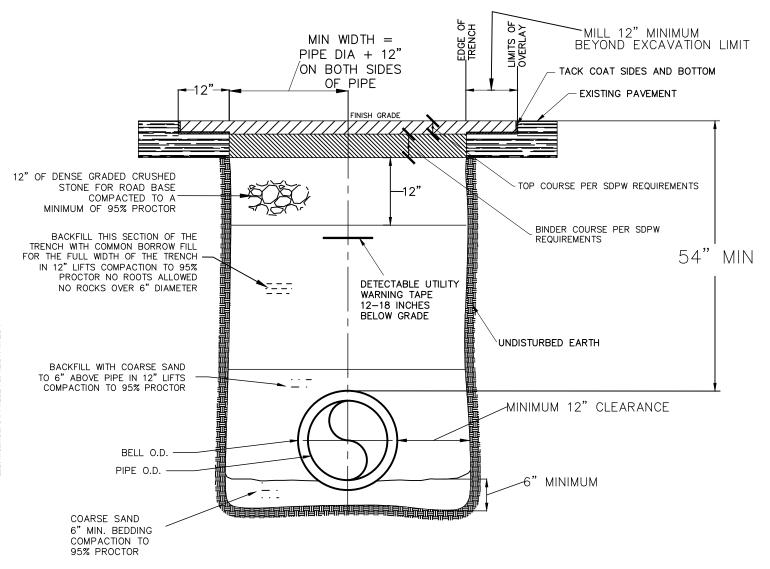
SPRINGFIELD WATER AND SEWER COMMISSION SEWER DETAIL S-08.0 REV. DATE 4/1/09 MAB STANDARD EXTERNAL **GREASE INTERCEPTOR** SCALE: NTS



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 1/18/19 DS 10/28/20 DS SERVICE / MAIN 2 1/2" VALVE BOX IN NON-PAVED AREAS SCALE: NTS



- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
- LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) A TOTAL OF 54 INCHES. PIPE SHALLOWER THAN 54 INCHES SHALL BE INSULATED.
- DETECTABLE WARNING TAPE SHALL BE INSTALLED 12-18 INCHES BELOW GRADE TO ALLOW USE OF A METAL DETECTOR FOR FUTURE FIELD LOCATION AND UTILITY
- 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".

 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.
- FOR TYPICAL LOCATION OF SEWER MAINS SEE DETAIL (W-01.0).
 ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.



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

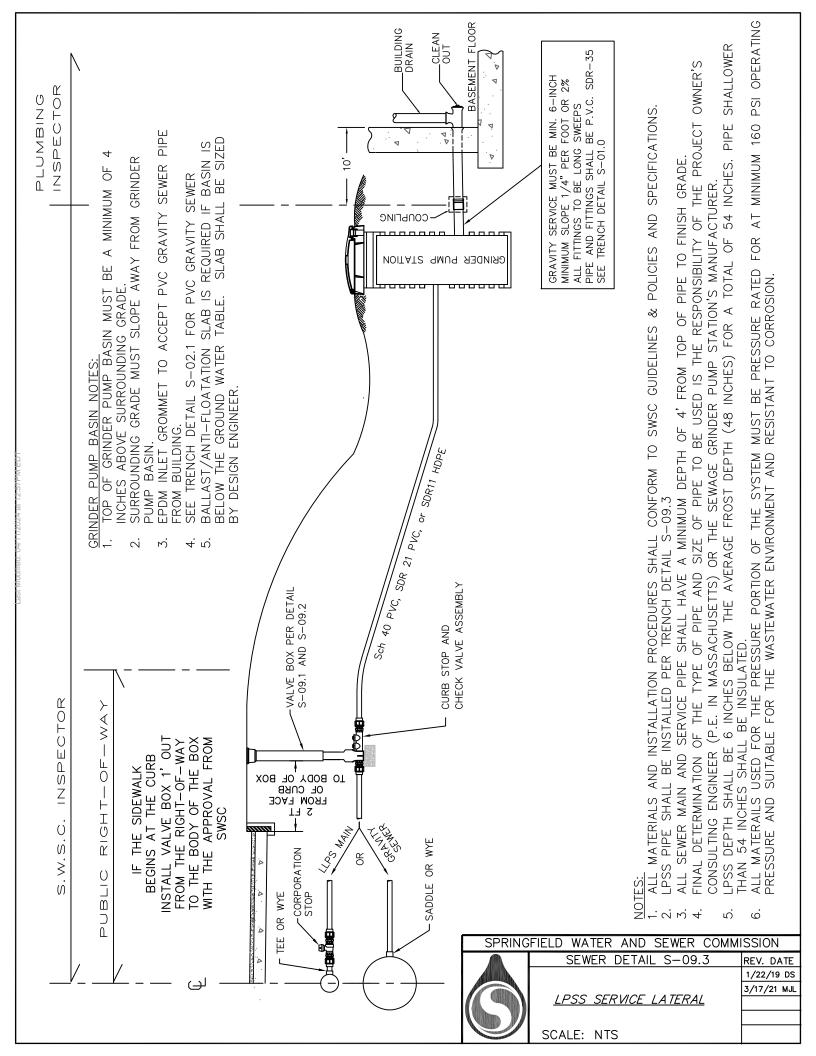
SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL S-09.2 REV. DATE

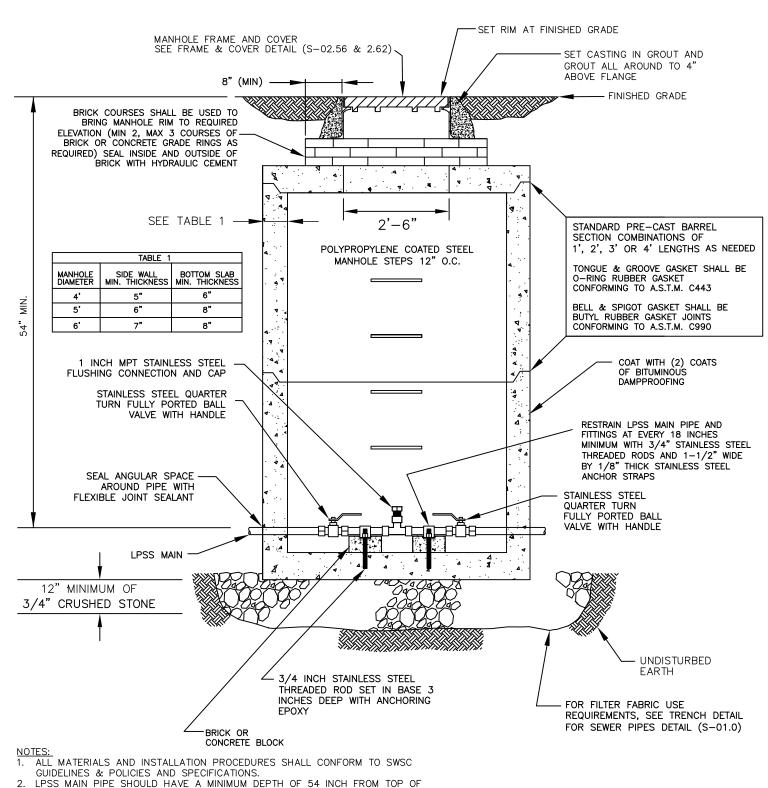


LOW PRESSURE SANITARY SEWER PIPE TRENCH DETAIL

SCALE: NTS

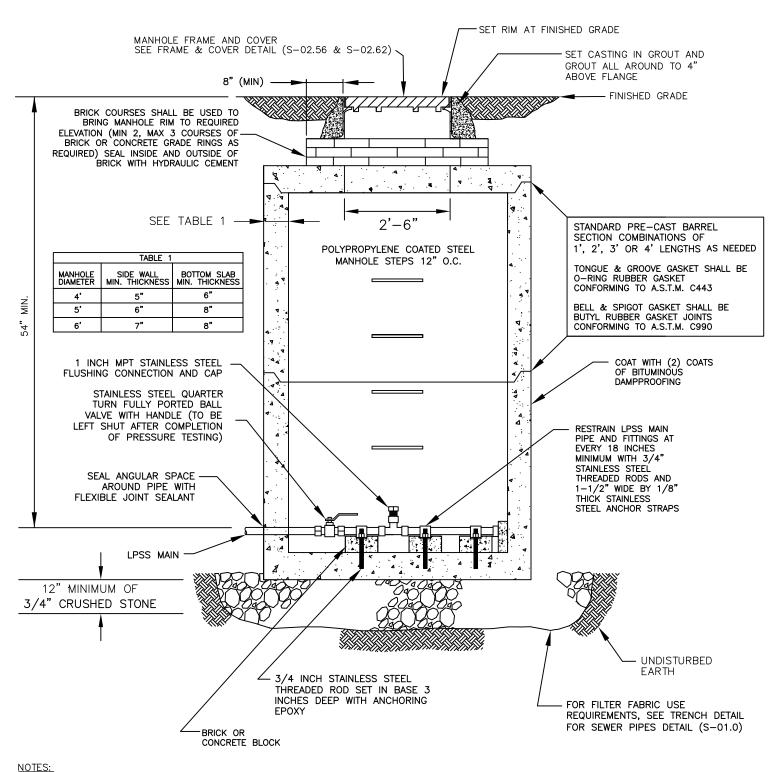
1-18-19 DS





- PIPE TO FINISH GRADE.
- IF 54 INCHES OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
- PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
- DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
- PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
- ALL BRICK SHALL BE HARD NON-POROUS CLAY.
- ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82. 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.

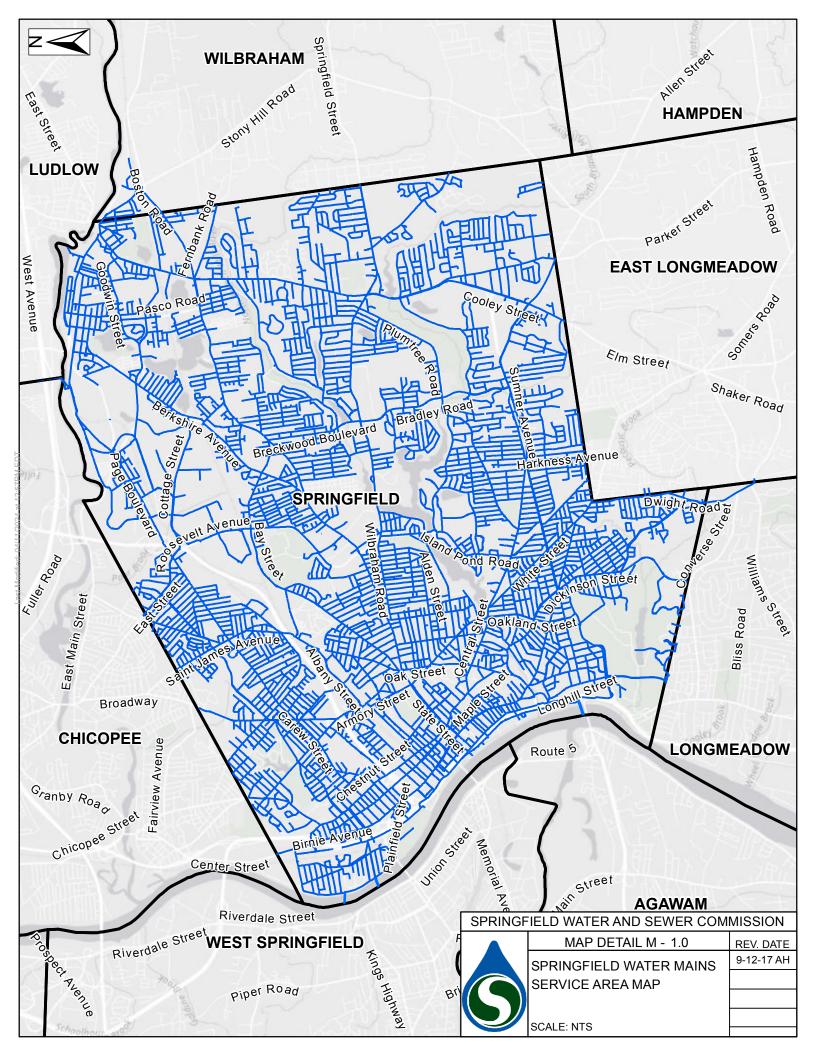
SPRINGFIELD WATER AND SEWER COMMISSION			
	SEWER DETAIL S-09.4	REV. DATE	
	LOW PRESSURE SANITARY	1/23/19 DS	
	<u>SEWER MAIN</u>		
	<u>INLINE FLUSHING STRUCTURE</u>		
	SCALE: NTS		

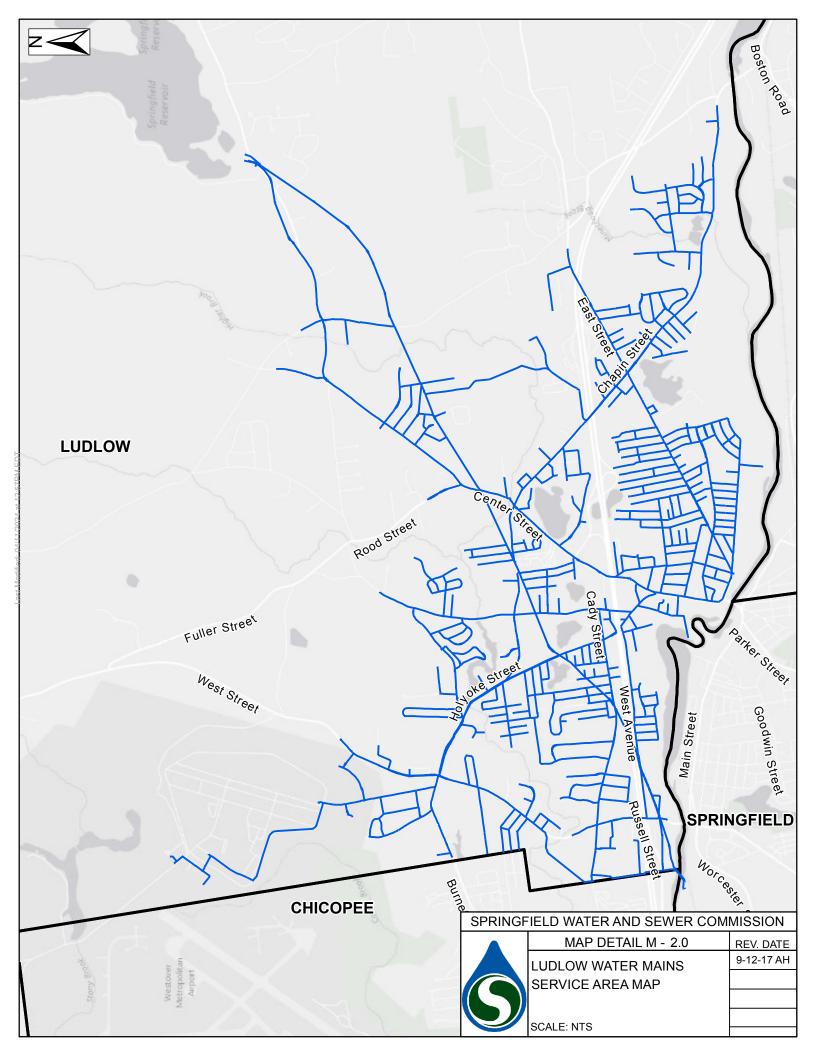


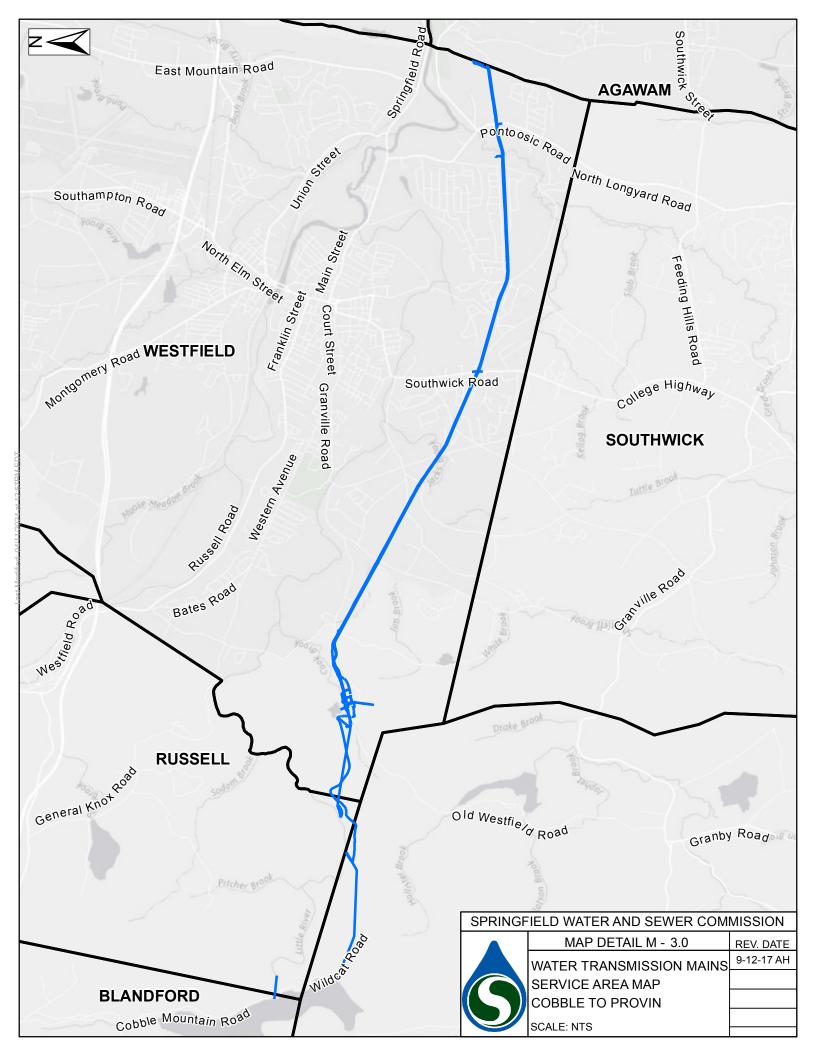
- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.

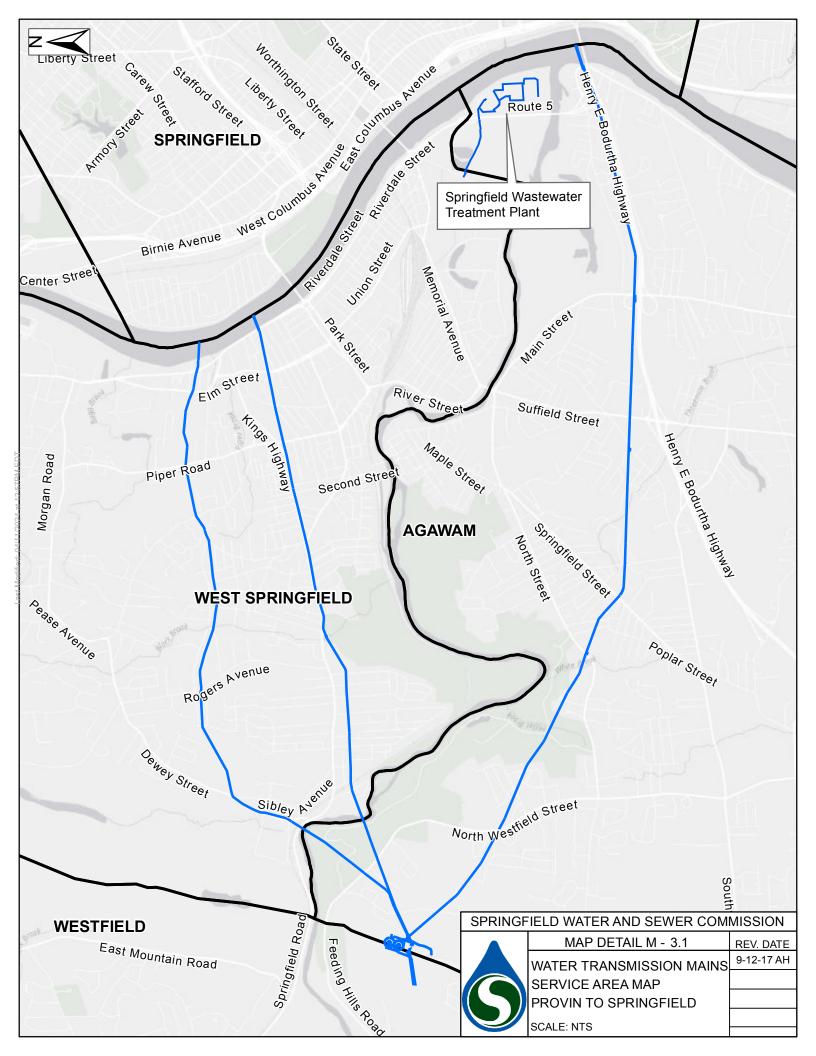
 LPSS PIPE SHOULD HAVE A MINIMUM DEPTH OF 54 INCHES FROM TOP OF
- PIPE TO FINISH GRADE.
- F 54 INCHES OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED. PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
- DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20LOADING.
- PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
- ALL BRICK SHALL BE HARD NON-POROUS CLAY.
- ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
- REINFORCING PER ASTM A615 FOR WIRE FABRIC.
- 10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

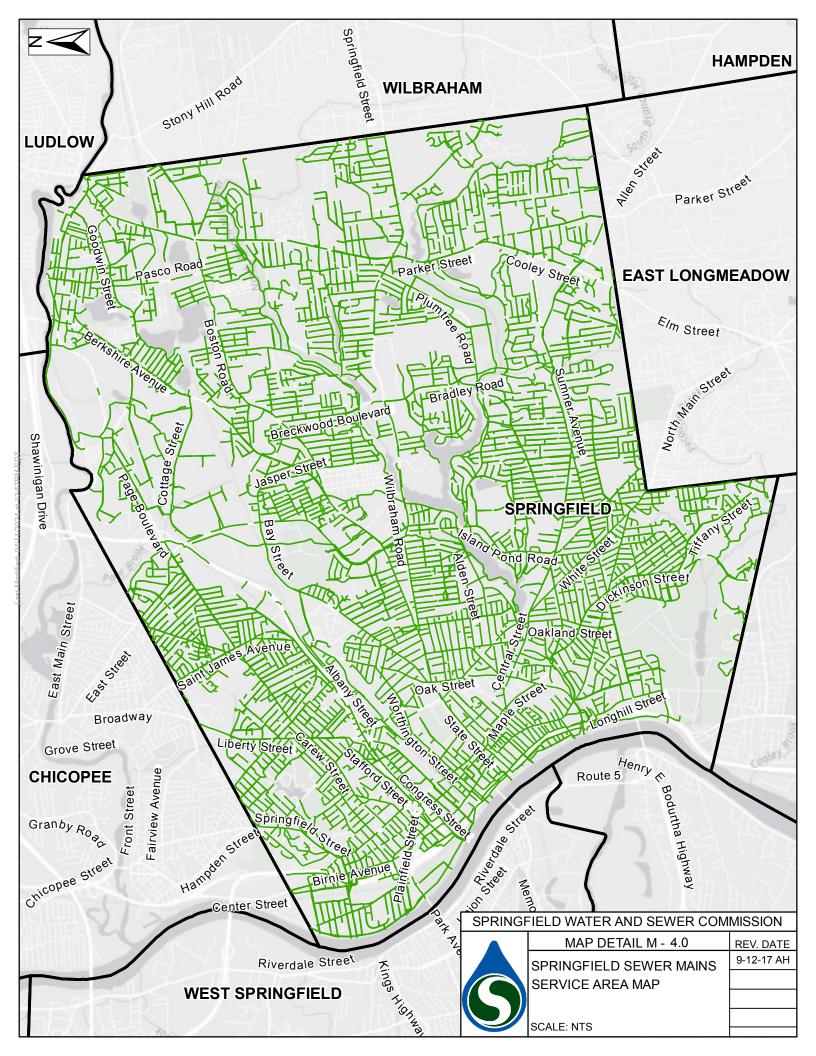
SPRINGFIELD WATER AND SEWER COMMISSION SEWER DETAIL S-09.5 REV. DATE 1/23/19 DS LOW PRESSURE SANITARY SEWER TERMINAL FLUSHING STRUCTURE SCALE: NTS





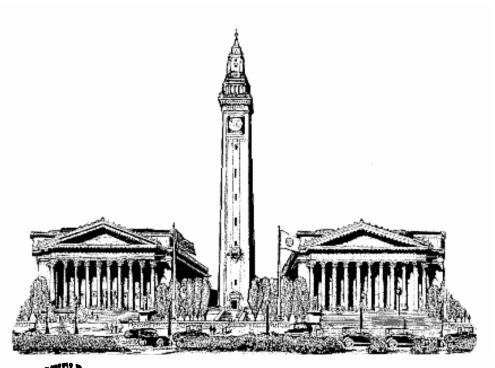






APPENDIX E Springfield DPW Standard Details

Springfield Department of Public Works Standard Engineering Details





CONSTRUCTION NOTES

- **1.** CALL DIG-SAFE (1-800-322-4844) A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
- 2. CONTRACTOR IS RESPONSIBLE FOR STREET OCCUPANCY PERMITS FROM THE ENGINEERING DIVISION, DEPARTMENT OF PUBLIC WORKS.
- **3.** NOTIFY FIELD INSPECTOR 48 HOURS PRIOR TO CONSTRUCTION.
- 4. APPROVED PLANS SHALL BE ON SITE AT ALL TIMES.
- 5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORSEEN CONDITIONS ARISE. ALL CHANGES SHALL BE APPROVED BY FIELD INSPECTOR.
- 6. CALCIUM CHLORIDE/ WATER FOR DUST CONTROL SHALL BE AVAILABLE AT ALL TIMES.
- **7.** ALL MATERIALS AND METHODS SHALL CONFORM TO CITY OF SPRINGFIELD D.P.W. AND WATER AND SEWER COMMISSION STANDARDS.
- **8.** THE CONTRACTOR SHALL ENSURE THE MAINTENANCE OF SAFETY AND TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
- **9.** THE CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
- **10.** ALL DRAINAGE STRUCTURES (CATCH BASINS / LEECHING BASINS) IN THE AREA SHALL BE PROTECTED FROM RUNOFF.
- **11.** "AS-BUILT" UTILITY DRAWINGS ARE TO BE SUBMITTED TO THE ENGINEERING DIVISION UPON COMPLETION OF THIS PROJECT.
- 12. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE RE-APPLIED.
- **13.** SPRINGFIELD D.P.W. APPROVAL IS NOT TO BE CONSTRUED AS AN ALL-INCLUSIVE APPROVAL, AS OTHER APPROVALS MAY BE NECESSARY, I.E. CITY FORESTER, CONSERVATION, FIRE DEPT. AND WATER AND SEWER COMMISSION. ETC.
- **14.** THE CONTRACTOR SHALL HAVE AN APPROVED S.W.P.P.P. ON SITE AS NEEDED.
- **15.** (OTHER NOTES AS NEEDED)

INDEX

- **0001** TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION AT CURB LINE (ASPHALT)
- **0002** TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION (ASPHALT)
- 0003 TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION WITH UNSUITABLE SUB BASE (ASPHALT)
- **0004** TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION AT CURB LINE (CONCRETE)
- **0005** TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION (CONCRETE)
- **0006** TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION WITH UNSUITABLE SUB BASE (CONCRETE)
- 0007 STANDARD SIDEWALK CONSTRUCTION AT COMMERCIAL DRIVEWAYS
- 0008 STANDARD SIDEWALK CONSTRUCTION AT RESIDENTIAL DRIVEWAYS
- 0009 TYPICAL SECTION 40' STREET LINE 28' PAVEMENT
- 0010 TYPICAL SECTION 40' STREET LINE 26' PAVEMENT CAPE COD BERM
- 0011 TYPICAL SECTION 50' STREET LINE 28' PAVEMENT CAPE COD BERM
- 0012 TYPICAL SECTION 50' STREET LINE 24' PAVEMENT
- 0013 TYPICAL SECTION 80' STREET LINE 28' PAVEMENT
- **0014** BERM 6"

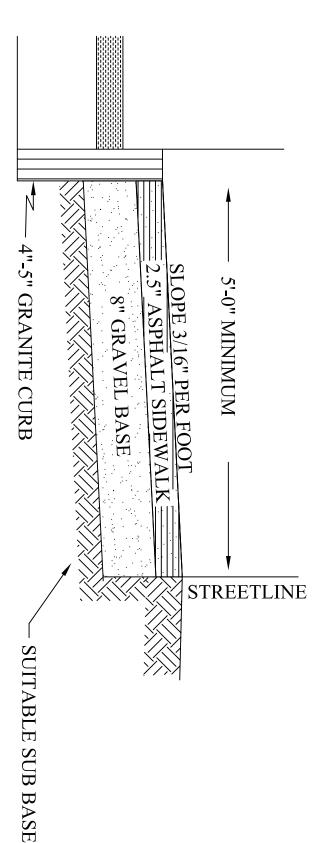
- 0015 CAPE COD BERM
- **0016** BERM TYPE A
- 0017 BRICK SIDEWALK, SIDEWALK TREATMENT AT UTILITIES
- 0018 BRICK SIDEWALK, SIDEWALK TREATMENT AT DRIVEWAYS
- 0019 TREE PIT TYPE E
- 0020 BRICK WHEELCHAIR RAMP
- 0021 BRICK TREE PLANTING
- 0022 TRAFFIC SIGNAL CONDUIT TRENCH
- 0023 RCP. CLASS IV PIPE TRENCH
- **0024** PIPE SUBDRAIN
- 0025 CLASS 'A' CONCRETE ARCH
- 0026 CURTAIN DRAIN
- **0027** PVC SDR35 PIPE TRENCH
- 0028 SILT FENCE
- 0029 STAKED HAY BALES
- 0030 TYPICAL PRECAST CONCRETE MANHOLE
- 0031 TYPICAL SECTION OF DROP TYPE MANHOLE
- 0032 TYPICAL SECTION FOR UTILITIES
- 0033 PRECAST CB OFFSET
- 0034 TWO LANE TWO WAY TRAFFIC CONTROL
- **0035** MDC GASOLINE TRAP MANHOLE
- 0036 LIGHT POST STREETLIGHT HEAD
- 0037 DECORATIVE LIGHTING IVY STYLE

- 0038 DECORATIVE LIGHTING BOROUGH STYLE
- 0039 PRECAST LIGHT POLE FOUNDATION
- 0040 TYPICAL LEACHING TRENCH
- 0041 DECORATIVE LIGHTING BISHOP'S CROOK
- **0042** HEADWALL
- 0043 STEEL BEAM GUARD RAIL
- 0044 PRECAST CONCRETE CATCH BASIN
- 0045 PRECAST CONCRETE CATCH BASIN WITH WEEPHOLE
- 0046 CATCH BASIN WITH PREFORATED PIPE OUTLET
- **0047** TYPICAL LEACHING GALLEY
- 0048 CATCH BASIN HOOD
- 0049 CATCH BASIN WITH CASTING
- 0050 SPRINGFIELD CITY SEAL
- **0051** ACCEPTANCE PLAN KEY 1
- **0052** ACCEPTANCE PLAN KEY 2
- **0053** ACCEPTANCE PLAN KEY 3
- 0054 TRENCH REPAIR SPECIFICATION RESIDENTIAL STREET
- 0055 TRENCH REPAIR SPECIFICATION ARTERIAL STREET
- **0056** -TYPICAL RESIDENTIAL DRIVEWAY
- 0057 GRANITE CURBING
- 0058 SEWER CONNECTION
- 0059 SIGNING AND BARRICADE PLAN TWO- WAY STREET CENTER OF ROAD

WORK AREA

- **0060** SIGNING AND BARRICADE PLAN TWO- WAY STREET SIDE OF ROAD WORK AREA
- **0061** SIGNING AND BARRICADE PLAN TWO- WAY STREET ALL TWO- WAY STREETS @INTERSECTIONS
- **0062** SIGNING AND BARRICADE PLAN TWO- WAY STREET TRENCH EXCAVATION
- 0063 SIGNING AND BARRICADE PLAN SIDEWALK & TREEBELT AREA
- 0064 SIGNING AND BARRICADE PLAN ROADWAY CRANE SERVICE AREA
- **0065** SIGN FACE DETAILS
- **0066** BERM TYPE A
- **0067** BERM TYPE B
- 0068 BERM TYPE C
- **0069** BERM TYPE D
- 0070 SIDEWALK REPAIR
- 0071 MULTIPLE EXCAVATION REPAIR
- 0072 IMPRINT OR INLAYED CROSSWALK REPAIR
- 0073 CROSSWALK DETAIL CONTINENTAL STYLE

FYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION AT CURB LINE (ASPHALT)



NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- ALL WORK TO CONFORM WITH SECTION 701.62 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

ID # 0001

TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION - 4"-5" GRANITE CURB SEED ON 4" LOAM VARIABLE (ASPHALT) SLOPE 3/16" PER FOOT 2.5" ASPHALT SIDEWALK 5'-0" or 6'-0" 8" GRAVEL BASE SUITABLE SUB BASE STREETLINE

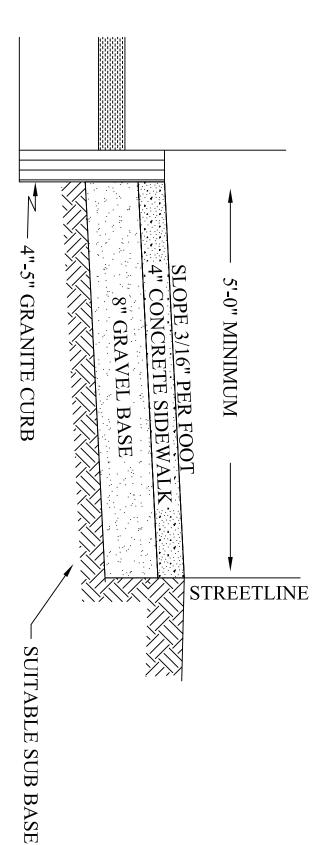
NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- ALL WORK TO CONFORM WITH SECTION 701.62 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

ID# 0002

ID# 0003 - STANDARD SIDEWALK SLOPE IS 3/16 PER FT NOTES: ALL WORK TO CONFORM WITH SECTION 701.62 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES UNSUITABLE SUB BASE (ASPHALT SIDEWALK CONSTRUCTION WITH **CYPICAL STANDARD SECTION FOR** - 4"-5" GRANITE CURB SEED ON 4" LOAM VARIABLE SLOPE 3/16" PER FOOT 2.5" ASPHALT SIDEWALK 5'-0" or 6'-0" 8"-24" GRAVEL BASE SPRINGFIELD, MA DPW 2-27-2006 UNSUITABLE SUB BASE **STREETLINE**

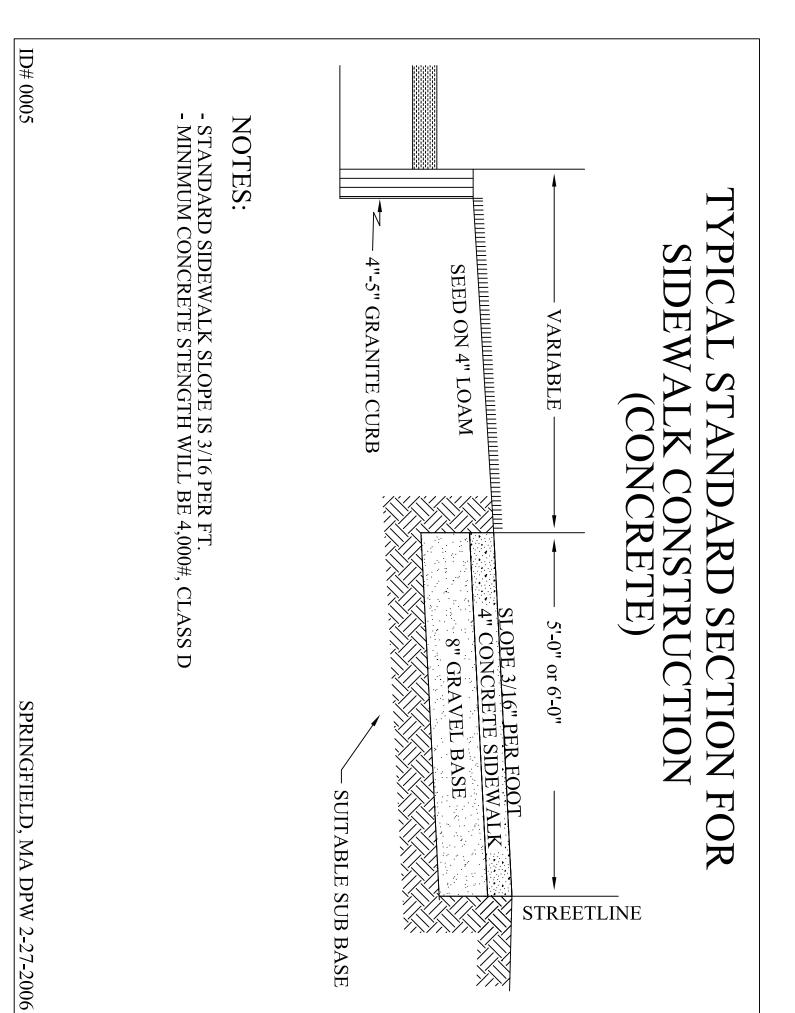
FYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION AT CURB LINE (CONCRETE)

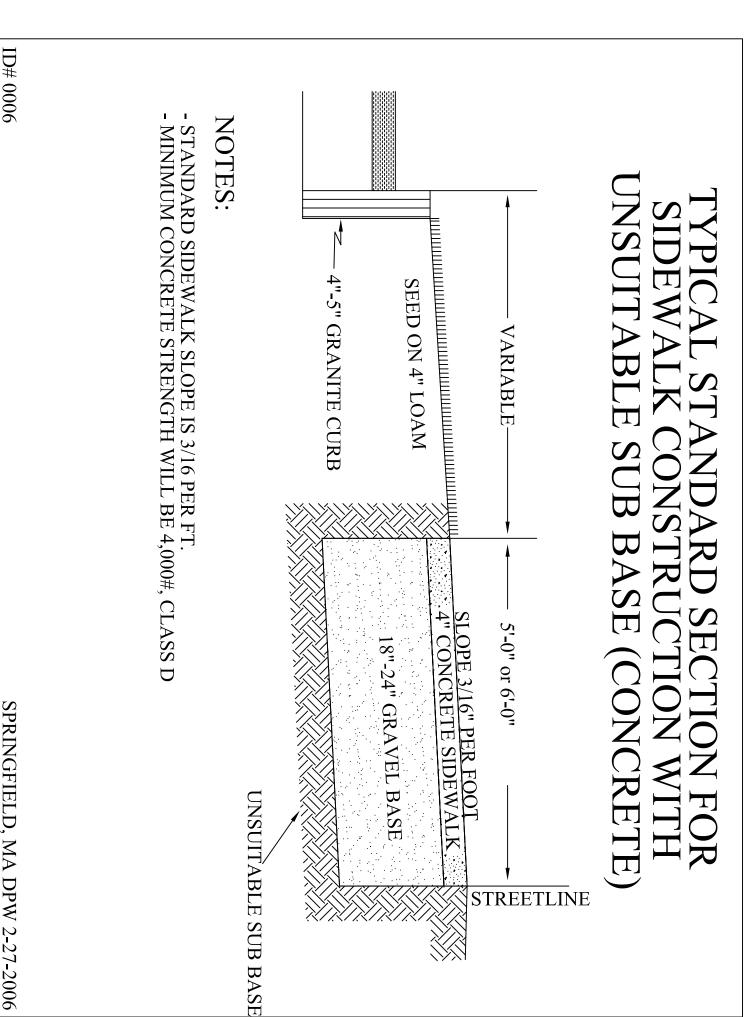


NOTES:

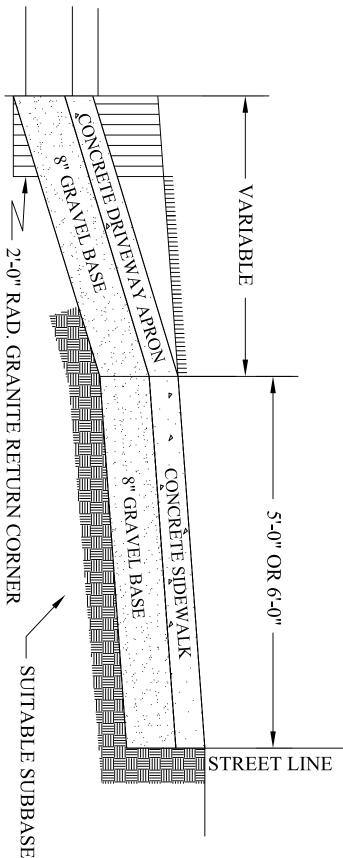
- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
 MINIMUM CONCRETE STENGTH WILL BE 4,000#, CLASS D

ID# 0004





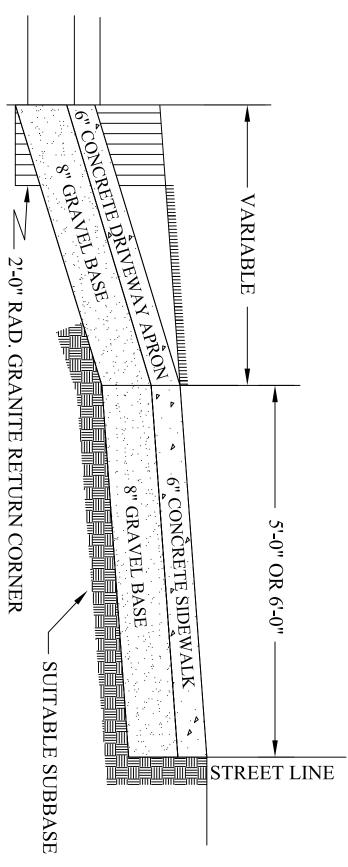
STANDARD SIDEWALK CONSTRUCTION AT COMMERCIAL DRIVEWAYS



- 9" CONCRETE MAY BE REPLACED BY 6" ASPHALT IF APPROVED
- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
 MAXIMUM DRIVEWAY WIDTH IS 40' WITH TWO 2' CURB RETURNS (36' OPENING)
- #3 REINFORCEING BARS SHALL BE PLACED 12" O.C., 3" FROM GRAVEL BASE
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

ID# 0007

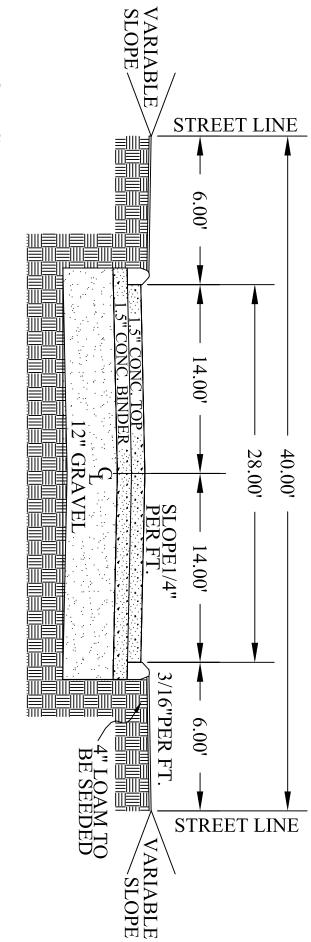
STANDARD SIDEWALK CONSTRUCTION AT RESIDENTIAL DRIVEWAYS



- 6" CONCRETE DEPTH TO BE REPLACED BY 3-1/2" ASPHALT(2" BINDER, 1-1/2 TOP) AS DIRECTED BY THE ENGINEER STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MAXIMUM DRIVEWAY WIDTH IS 24' WITH TWO 2' CURB RETURNS (20' OPENING)
- WIRE WELDED FABRIC PLACED 1-1/2" ABOVE GRAVEL BASE
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

ID# 0008

TYPICAL SECTION 40' STREET LINE 28' PAVEMENT

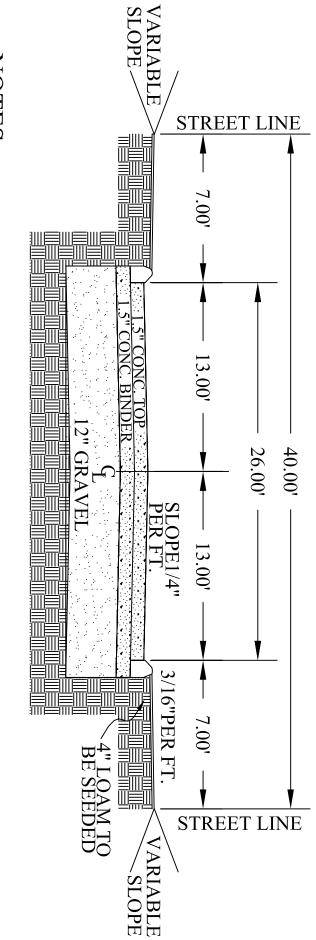


NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:
- 1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:

12" GRAVEL

TYPICAL SECTION 40' STREET LINE 26' PAVEMENT CAPE COD BERM

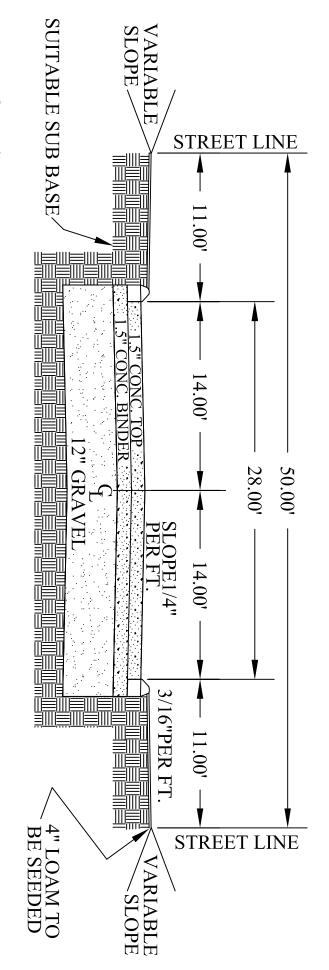


NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:
- 1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:

12" GRAVEL

TYPICAL SECTION 50' STREET LINE 28' PAVEMENT CAPECOD BERM

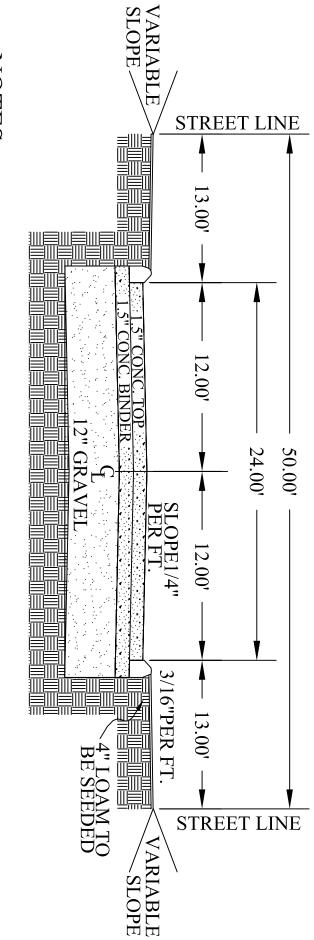


NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:
- 1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:

12" GRAVEL

TYPICAL SECTION 50' STREET LINE 24' PAVEMENT

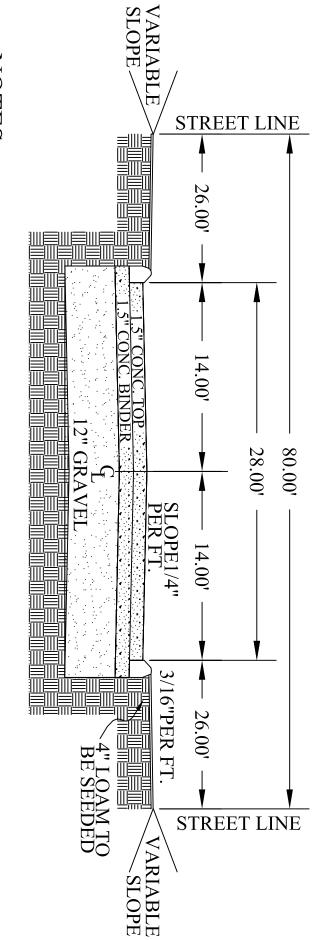


NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:
- 1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:

12" GRAVEL

TYPICAL SECTION 80' STREET LINE 28' PAVEMENT

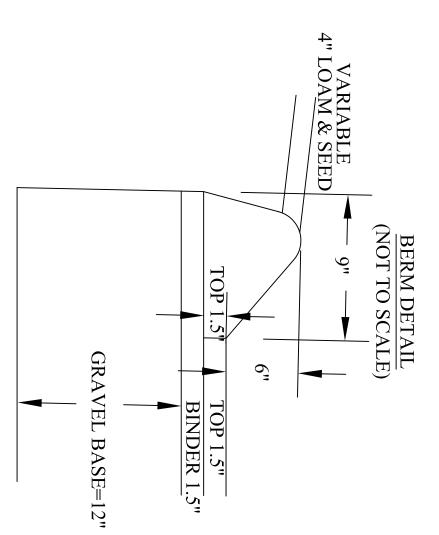


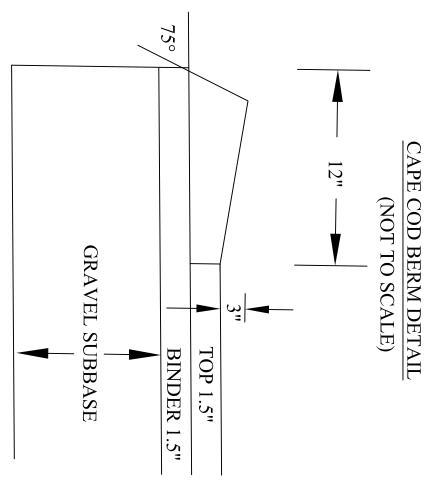
NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:
- 1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:

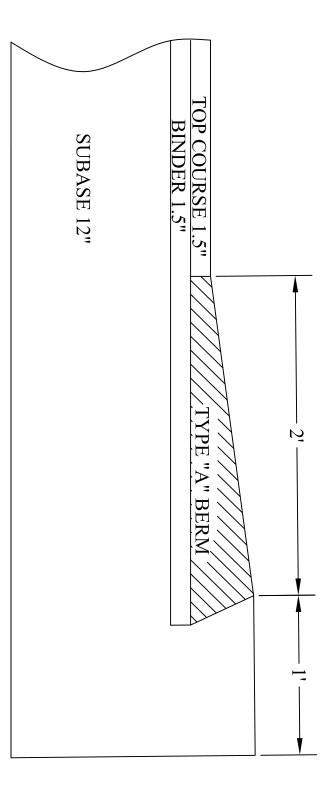
12" GRAVEL

BERM 6"

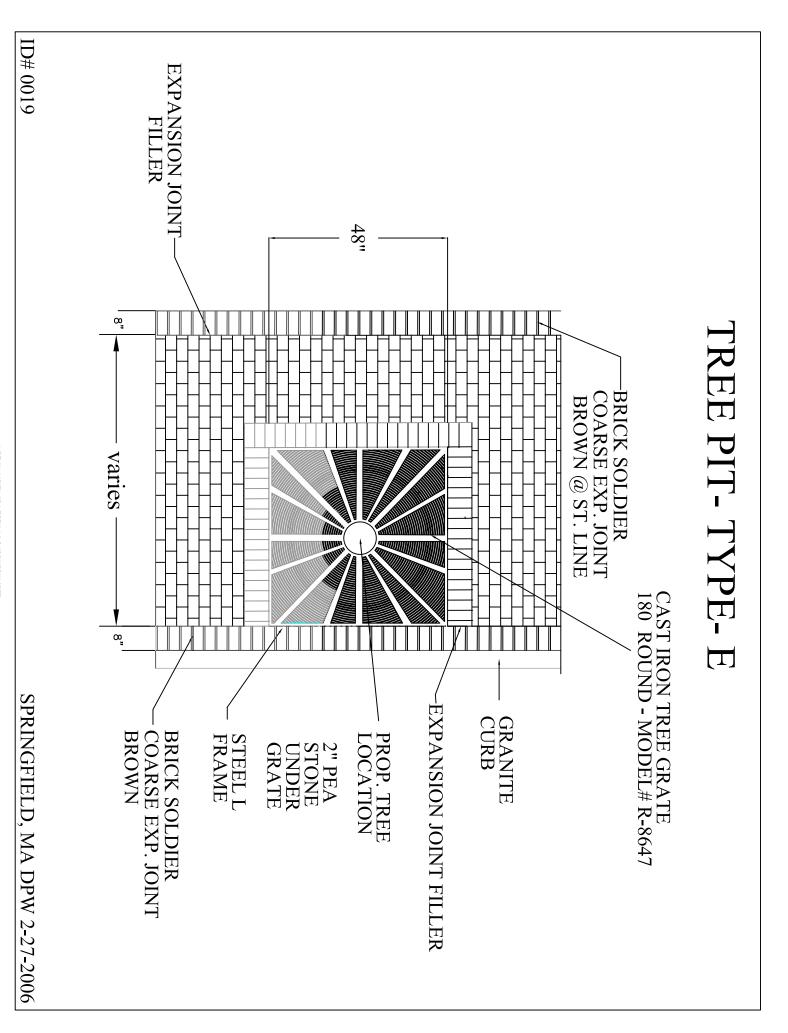


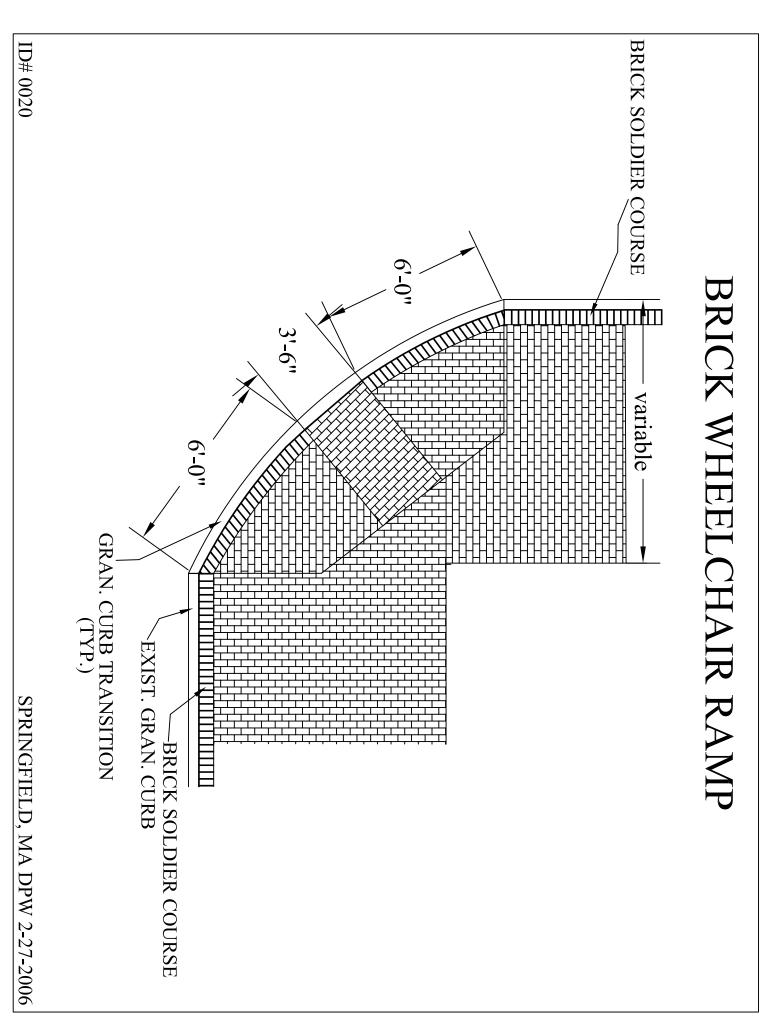


ID# 0015



SIDEWALK TREATMENT AT UTILITIES 36" TYP VARIES 36" **BRICK SIDEWALK** R=24" **VARIES** VARIES 16" 24" 2"CEMENT CONC. INFILL OVER 2" SAND BASE 4" TYP. STREET LIGHT POLE FOUNDATION **BRICK SIDEWALK** CEMENT CONC. SIDEWALK PROP. RADIUS BRICK AT HYDRANT (SEE CONSTRUCTION PLANS FO LOCATIONS)



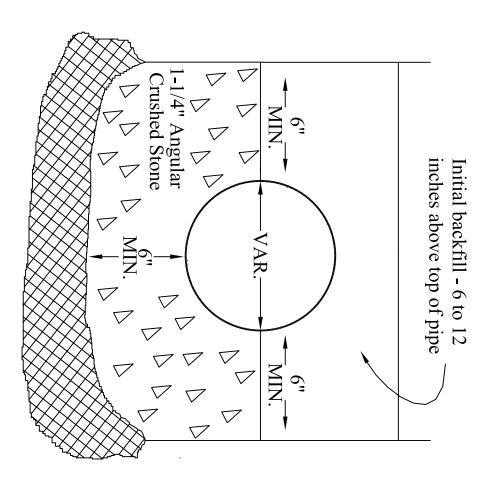


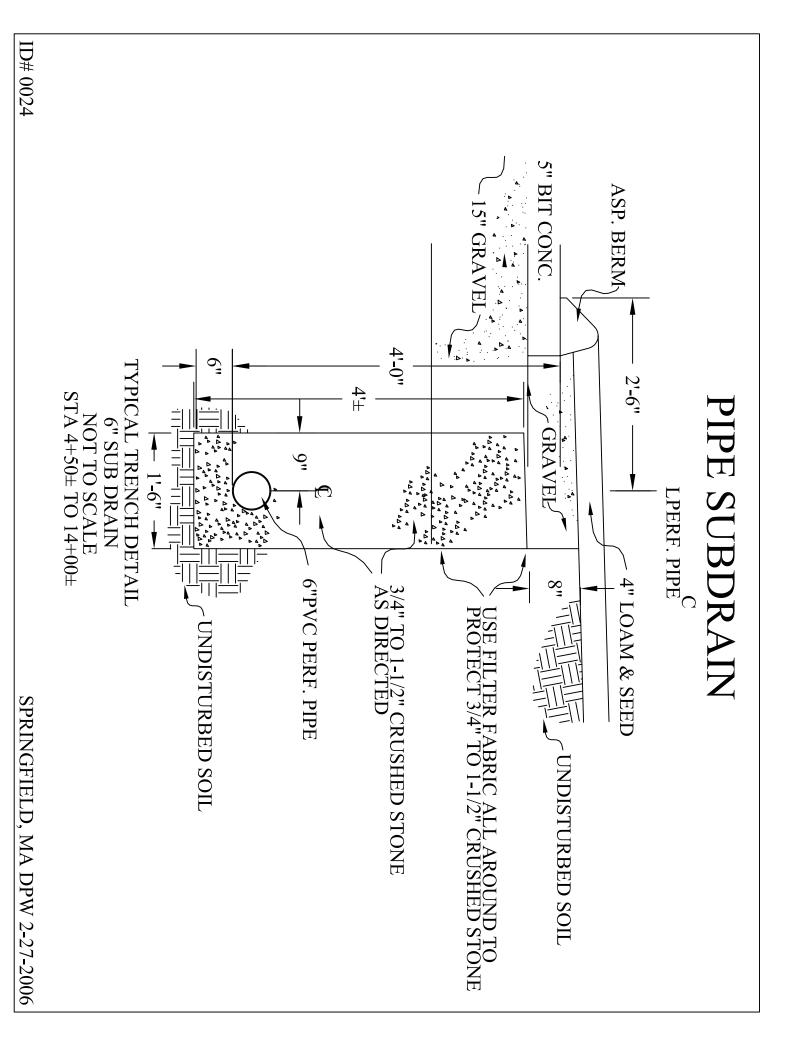
- TREES SHALL BE PLANTED PLUMB NOTES: BRICK PAVERS SET ON A 2" LAYER OF SAND PROVISIONS) COVERED BY A LAYER OF WEED BLOCKING FABRIC PLANTABLE SOIL MIXTURE (SEE SPECIAL BRICK TREE PLANTING VARIES 6 12"min. 2"X2" SPRUCE POST UNPAINTED - DRIVE POST AT ANGLE AND - DRAW TO VERTICLE JNTIE AND ROLL BACK BURLAP FROM TOP 1/3 OF ROOT BALL TWO STRANDS OF #18 GUAGE TWISTED STEEL WIRE BLACK RIENFORCED RUBBER HOSE

SPRINGFIELD, MA DPW 2-27-2006

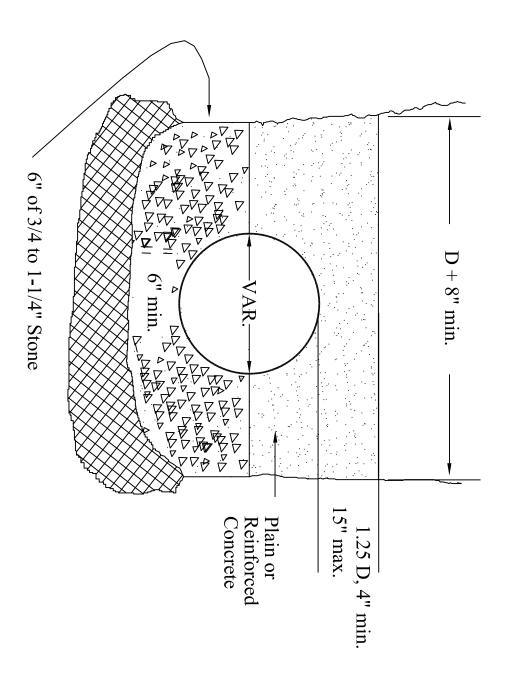
ID# 0021

RCP. CLASS IV PIPE TRENCH

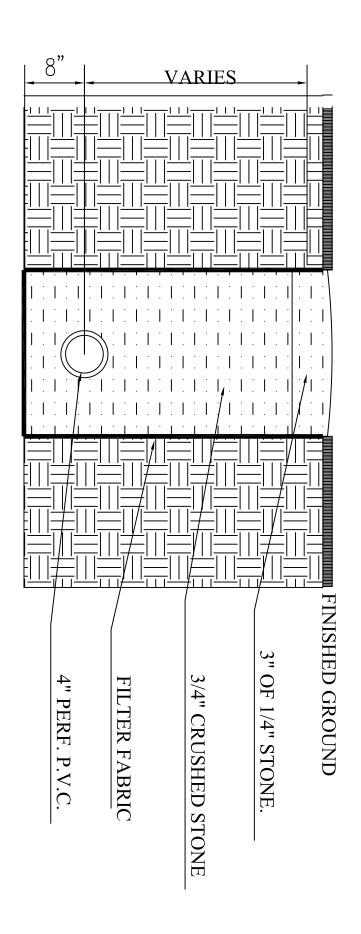




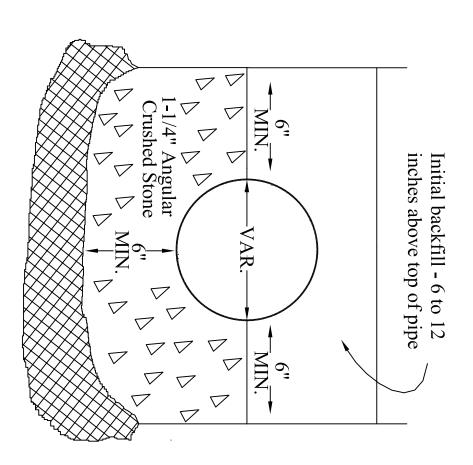
CLASS 'A' CONCRETE ARCH

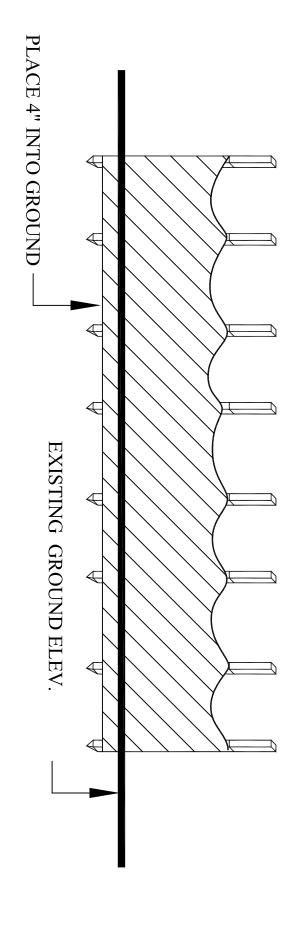


CURTAIN DRAIN

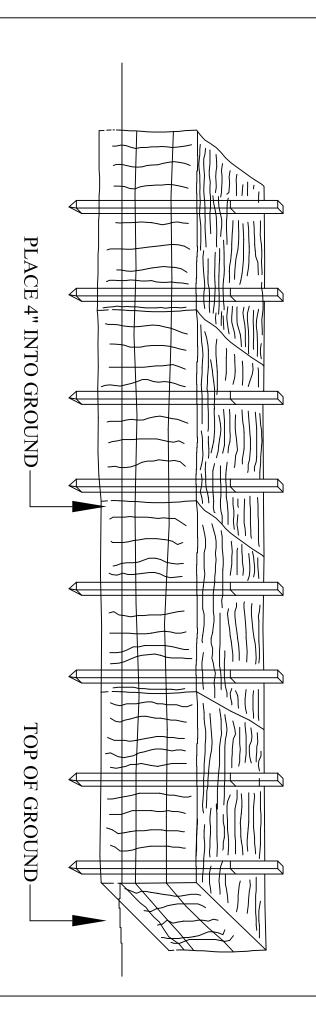


PVC-SDR35 PIPE TRENCH

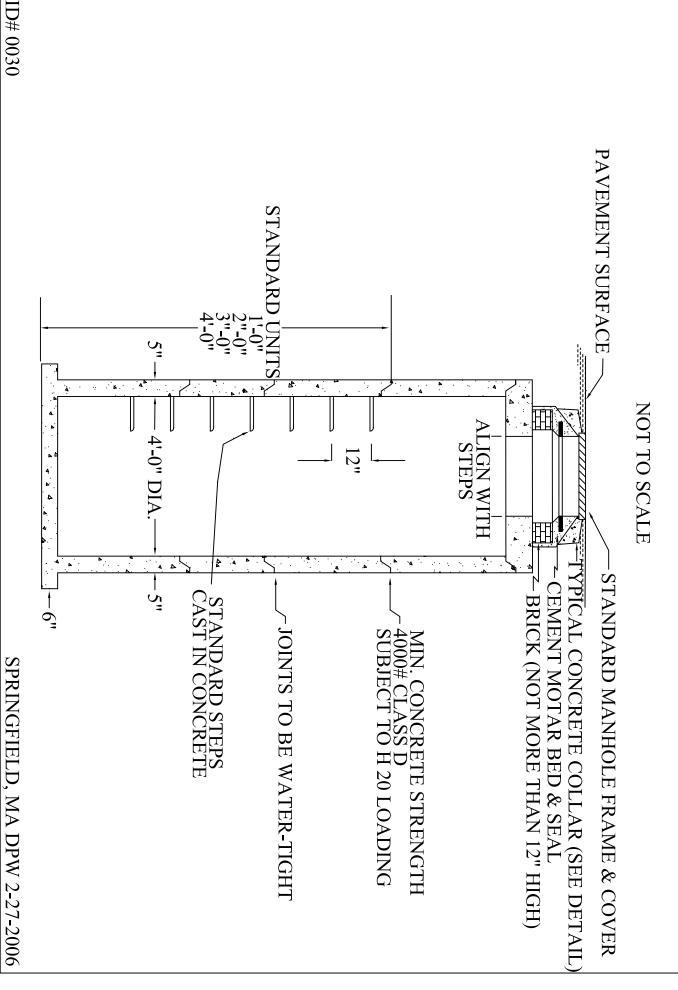




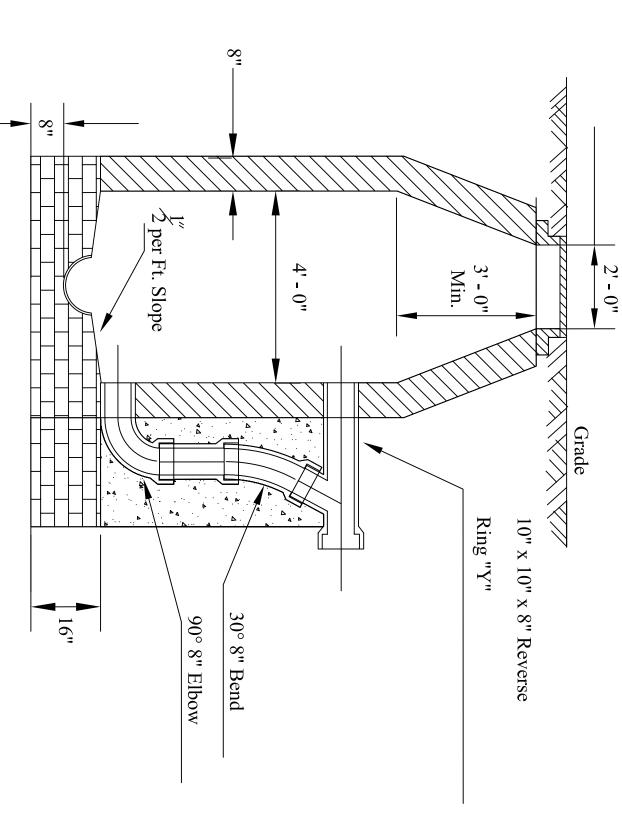
MITAGATION MEASURE



TYPICAL PRECAST CONCRETE MANHOLE



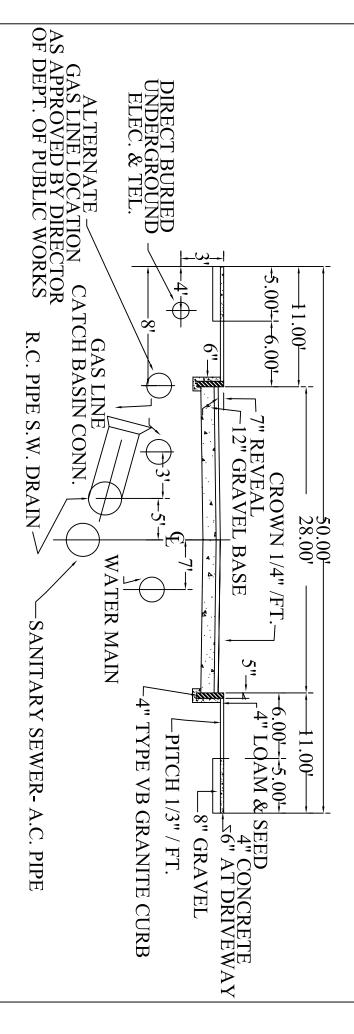
TYPICAL SECTION OF DROP TYPE MANHOLE



SPRINGFIELD, MA DPW 2-27-2006

ID# 0031

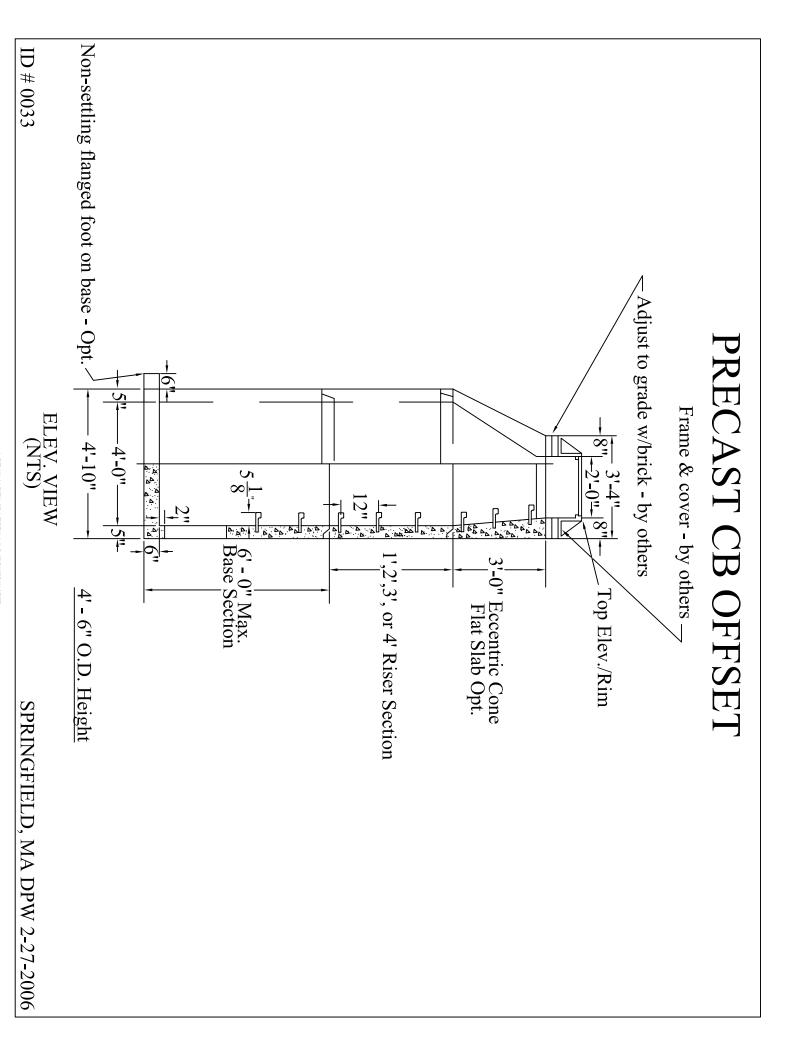
STREET TYPICAL SECTION FOR UTILITIES

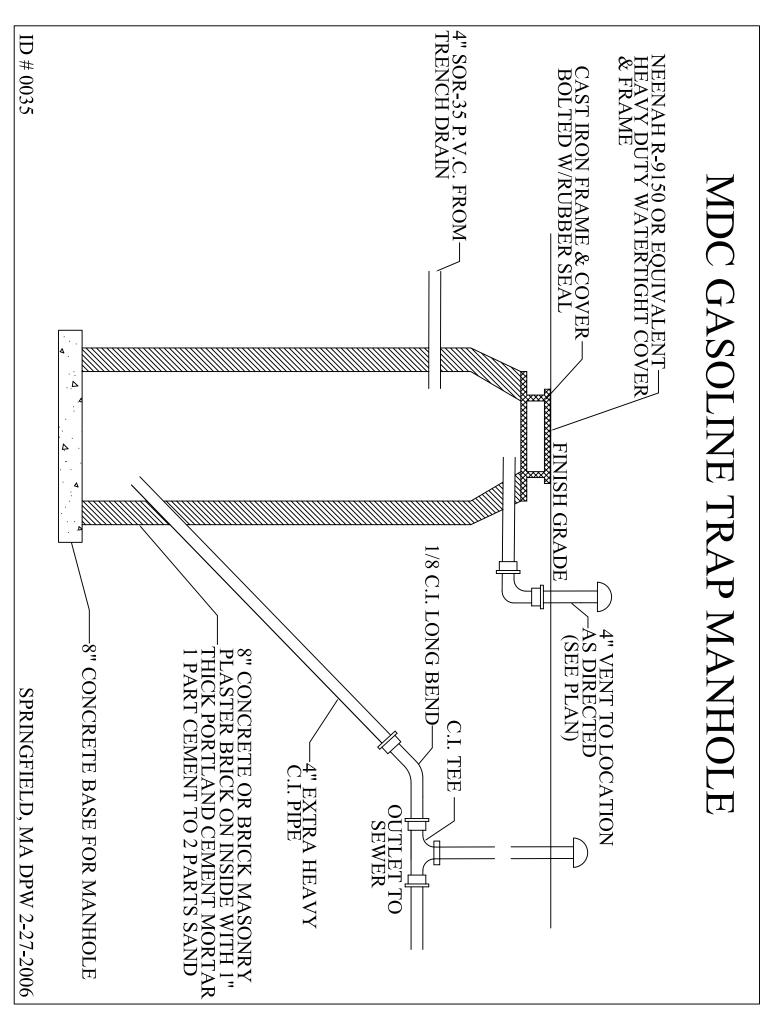


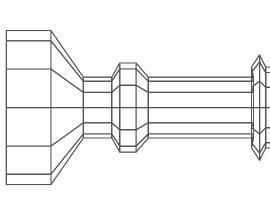
NOTES:

- WHERE PRACTICABLE STORMWATER LINES ARE PLACED 5' OFF THE CENTER LINE ON THE SOUTH OR WEST SIDE OF THE STREET
- WATER MAINS ARE 18' OFF STREET LINE, EITHER NORTH OR EAST SIDE OF THE STREET
- CONNECTIONS FROM CATCH BASINS TO MANHOLES- V.C. PIPE- CLASS 200-64T OR EQUAL
- SURFACE COURSE 3" TYPE I BIT. CON. LAID IN TWO COURSES- 1 1/2" TOP COURSE
- 1/2" BINDER COURSE

ID # 0032









DECORATIVE LIGHTING IVY STYLE

LUMINARE SPECIFICATIONS

7" FITTER
HEIGHT: 34"
WIDTE STYLE: EDGEWATER REFRACTIVE PANELS-

--20"-

WIDTH: 20" ACROSS POINT TO POINT MATERIAL: CAST ALUMINUM

POLYCARBONATE

CLEAR

PANELS

BALLAST COVER

PANELS: CLEAR POLYCARBONATE FINISH: BLACK LAMPING: 70 WATT HIGH PRESSURE SODIUM VOLTAGE: QUADRI- VOLTS BALLST WIRED

FOR 120 VOLTS- HPF

REFRACTOR: TYPE5/PRISMATIC ACRYLIC HARDWARE: STAINLESS STEEL

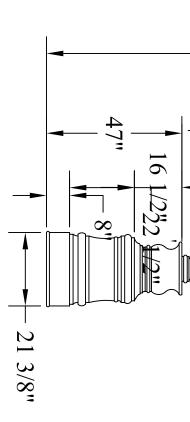
WEIGHT: 50 POUNDS APPROX

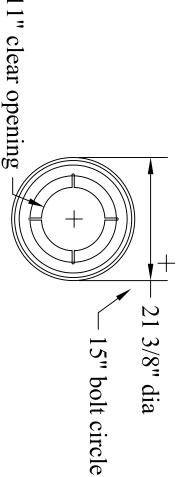
LAMP POST SPECIFICATIONS

8'-8 1/8"

21 |3/4" -

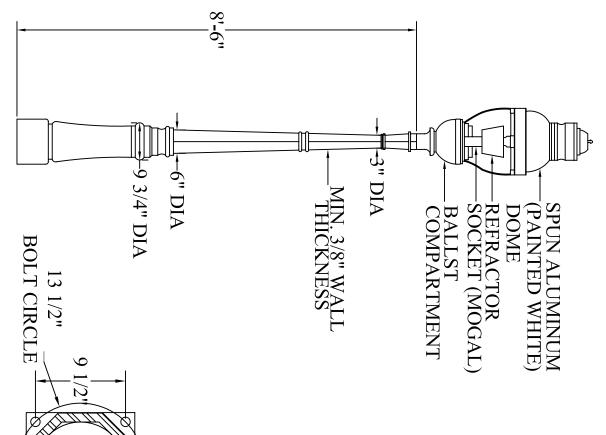
TER: 14'-0 1/8" 1 3/8" DIAMETER PRIME PAINT BLACK





SPRINGFIELD, MA DPW 2-27-2006

DECORATIVE LIGHTING BOROUGH STYLE



LUMINAIRE SPECIFICATIONS

STYLE: READING

HEIGHT: 43 7/8" WIDTH: 17 1/8" MATERIAL: CAST ALUMINUM

FINISH: FINISH PAINT (BLACK)

REFRACTOR: PRISMATIC GLASS TYPE 5 LAMPING: 70 WATT HIGH PRESSURE

SODIUM VOLTAGE: QUADRA-VOLT BALLAST

WIRED FOR 1 HARDWARE: STAINLESS WEIGHT: 40 POUNDS

LAMP POST SPECIFICATIONS

STYLE: BOROUGH

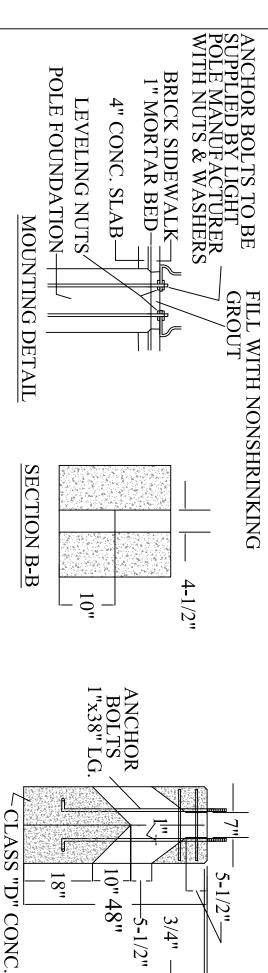
HEIGHT: 8'-6"

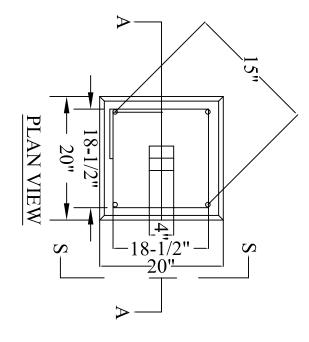
LIGHT CENTER: 10'-0 3/4"
BASE: 11 1/2" SQUARE
FINISH: PRIME PAINT (BLACK)
WEIGHT 40 POUNDS

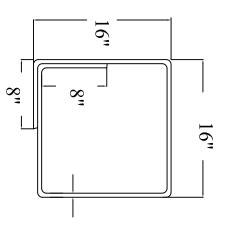
9 1/2" CLEAR OPENING

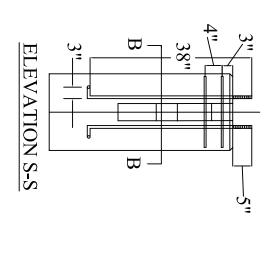
ID # 0038

PRECAST LIGHT POLE FOUNDATION









SECTION A-A

1/2"

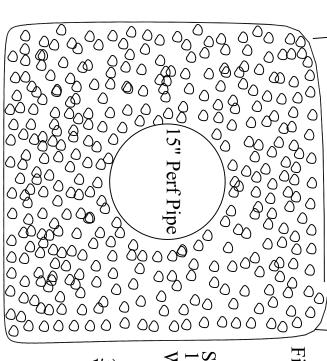
SPRINGFIELD, MA DPW 2-27-2006

1/2" DIA.x 6'-8" LONG BENT AS SHOWN REINFORCING ROD

TYPICAL LEACHING TRENCH



Suitable Material Variable Cover

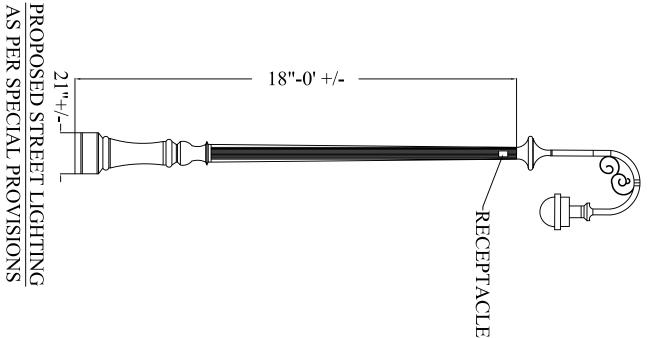


Filter Fabric

Surround Pipe with 12" of Stone and Wrap with Filter Fabric

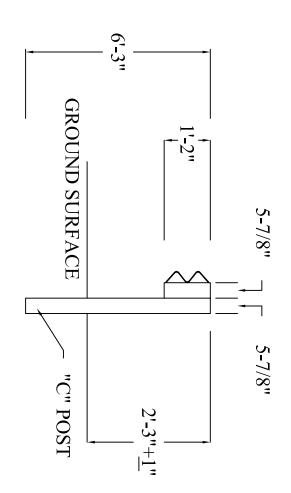
3/4"-1 1/2" Washed Stone

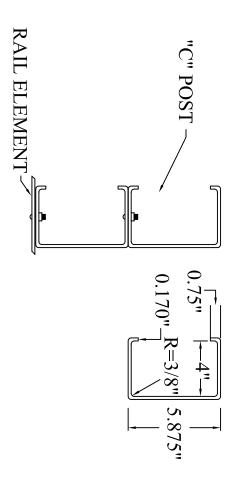
DECORATIVE LIGHTING BISHOP'S CROOK



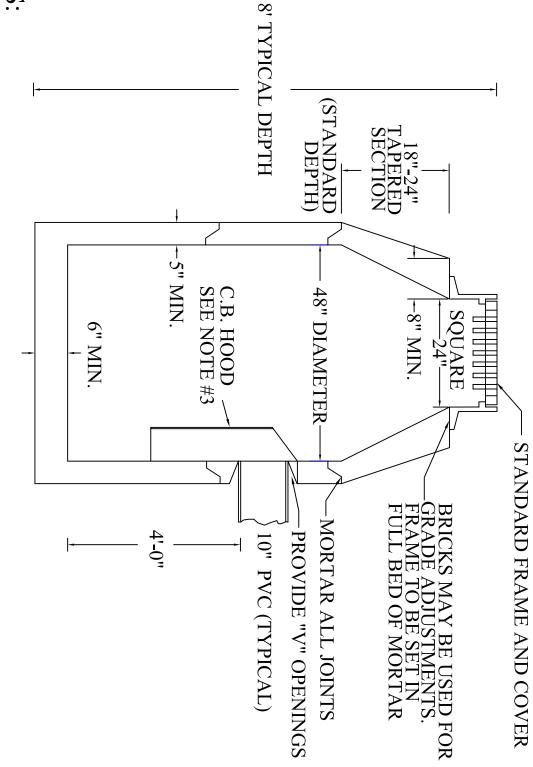
SPRINGFIELD, MA DPW 2-27-2006

SPRINGFIELD, MA DPW 2-27-2006





PRECAST CONCRETE CATCH BASIN

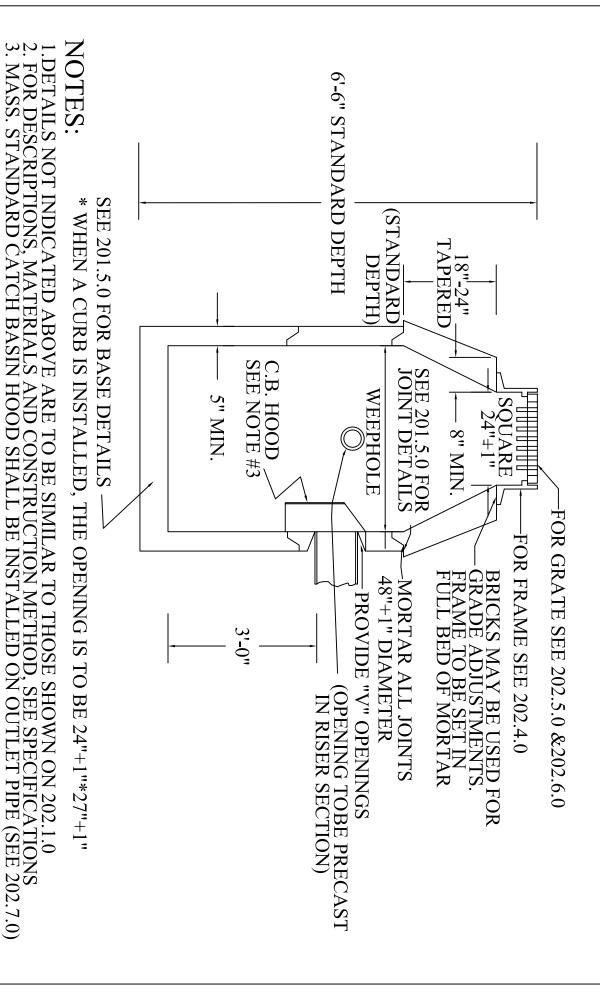


MASS. HIGHWAY STANDARD CATCH BASIN HOOD SHALL BE INSTALLED ON OUTLET PIPE.

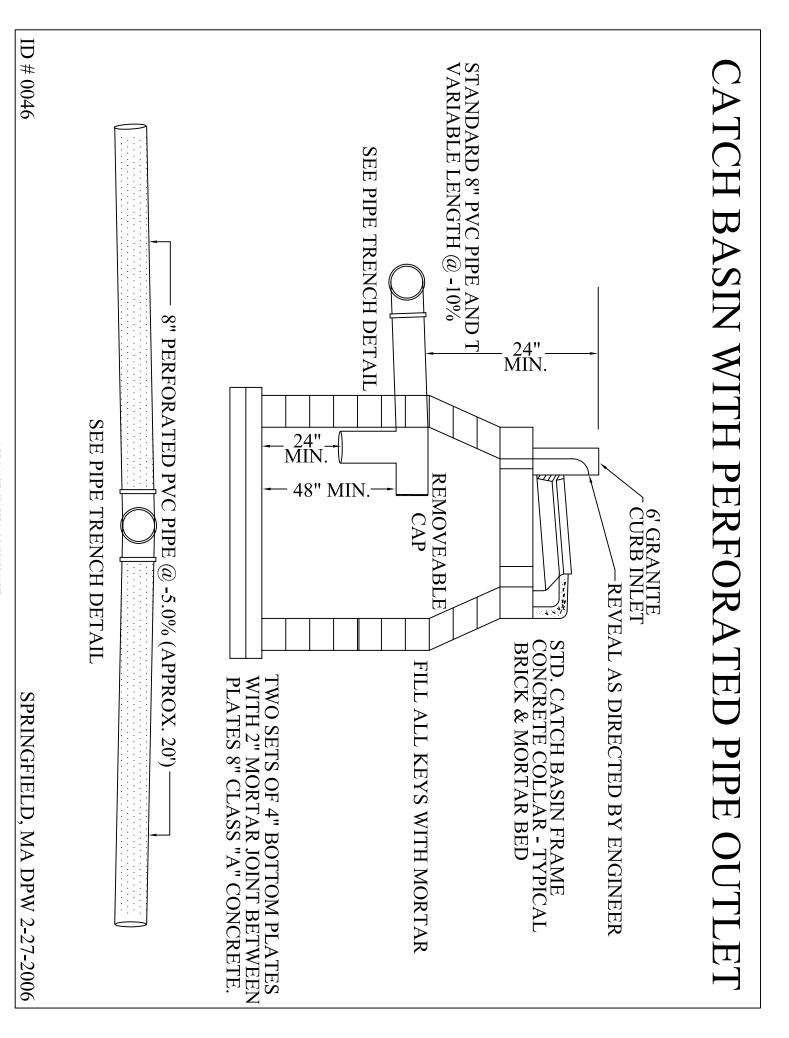
4. STRUCURE TO COMPLY WITH ALL CITY OF SPRINGFIELD DPW STANDARDS

ID # 0044

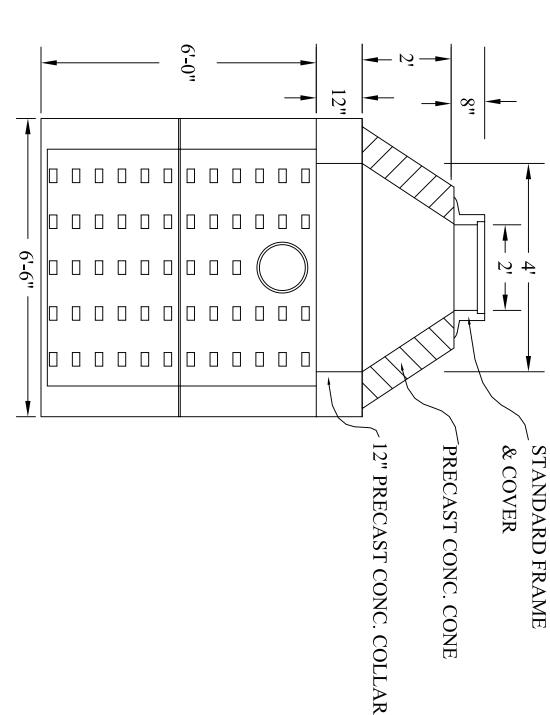
PRECAST CONCRETE CATCH BASIN



ID # 0045





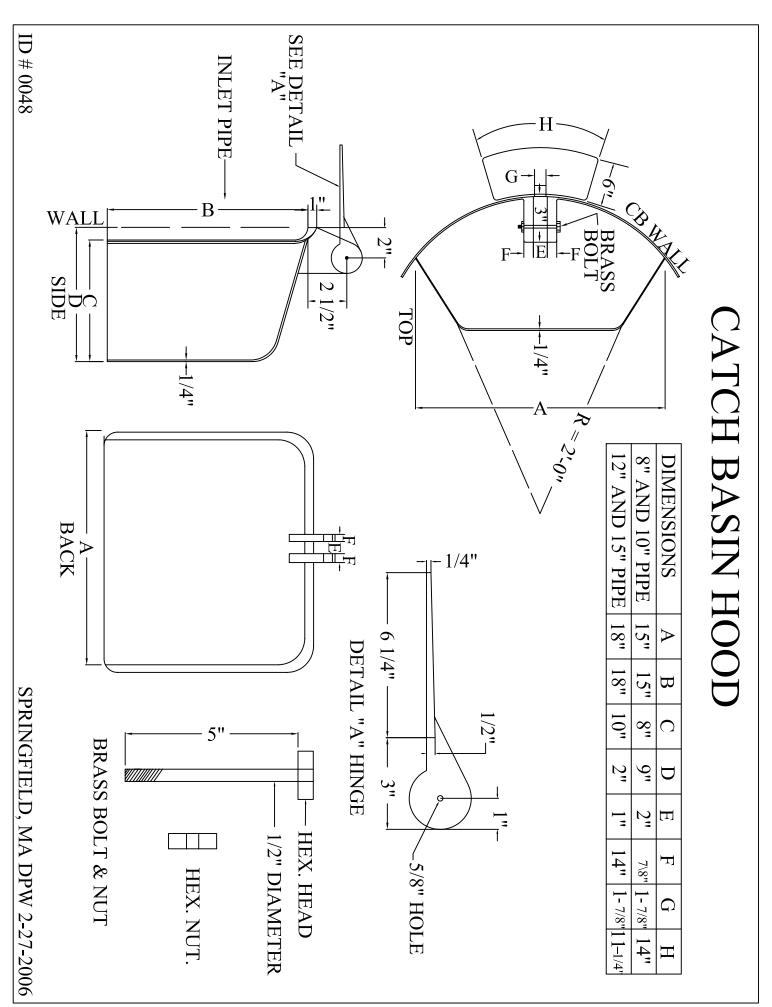


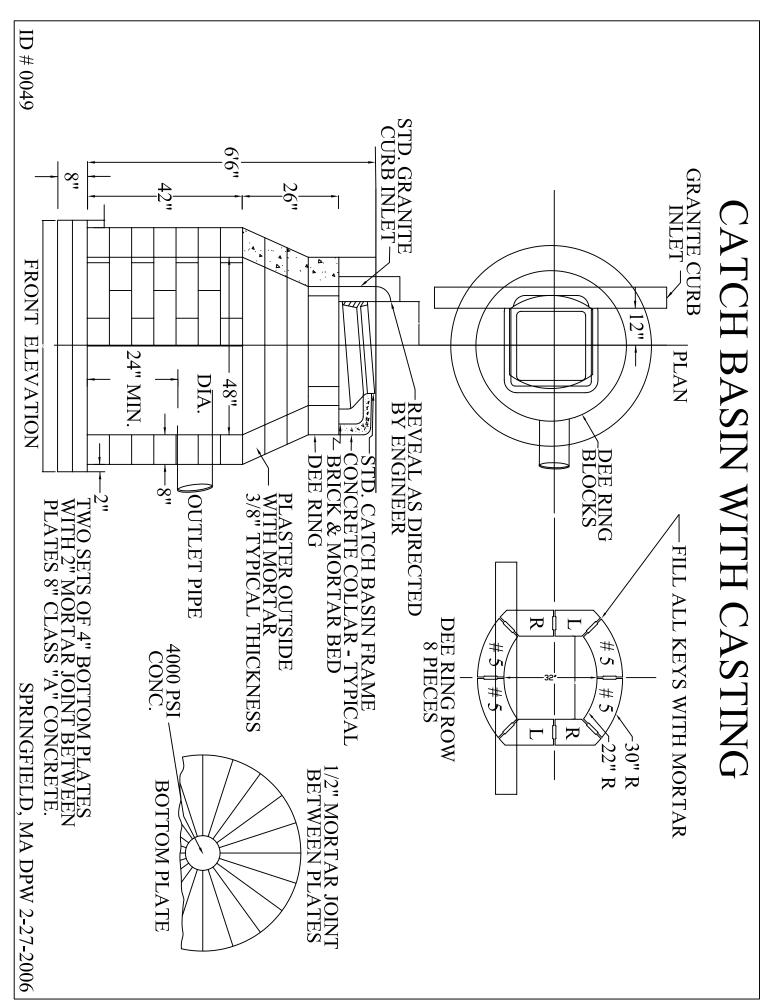
NOTES:

- USE 1.00' OF WASHED STONE SURROUNDING & UNDER ALL GALLEYS. USE FILTER FABRIC AROUND STONE.

- MIN. CONCRETE STRENGTH4000# CLASS D ALL H-20 LOADING SOLID CONCRETE BOTTOM FOR CLEANING

ID # 0047







ast Modified: 04/11/2024 at 12:57PM EDT

ACCEPTANCE PLAN KEY

KEY

GUY POLE

FIRE HYDRANT CATCH BASIN MAIL BOX

EXISTING SB PROP. GSB

DRAINAGE MANHOLE SANITARY MANHOLE

UTILITY POLE STUMP TREE IRON PIN IRON BAR

ID # 0051

SPRINGFIELD, MA DPW 2-27-2006

Last Modified: 04/11/2024 at 12:57PM EDT

KEY

GUY POLE UTILITY POLE TREE

□ ⊚∑₹ **o** bd 🕁

WATERGATE GASGATE PROP. GSB

ID # 0052

SPRINGFIELD, MA DPW 2-27-2006

Last Modified: 04/11/2024 at 12:57PM EDT

ACCEPTANCE PLAN KEY 3

KEY

FIRE HYDRANT CATCH BASIN

MAIL BOX

DRAINAGE MANHOLE

⊙ SANITARY MANHOLE

EXISTING SB IRON PIN WETLAND FLAGGING

GUY POLE UTILITY POLE

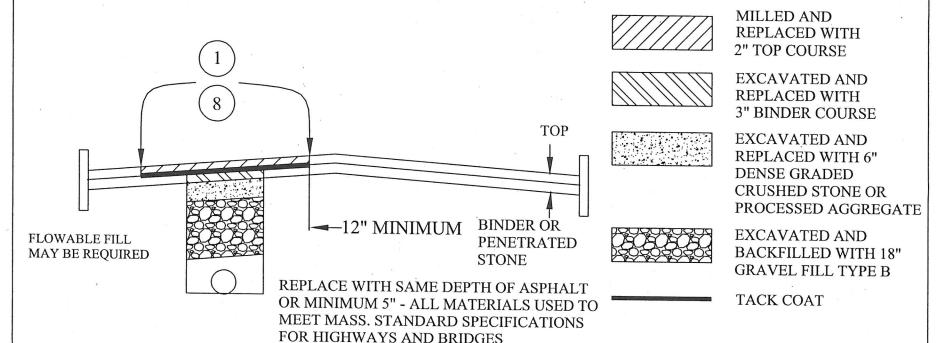
STUMP TREE

WATERGATE

GASGATE IRON BAR

PROP. GSB

TRENCH REPAIR SPECIFICATION ARTERIAL STREET

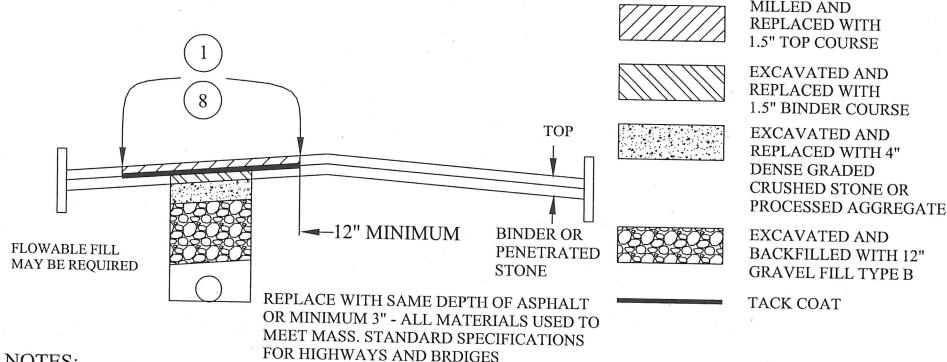


NOTES:

- 1. SAW CUT OUTER EDGE OF UTILITY PATCH
- 2. MILL TO REMOVE TOP COURSE
- 3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
- 4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM OF CROSS SECTION AS SHOWN ABOVE
- 5. REPLACE LAYERS OF GRAVEL, CRUSHED STONE AND BINDER
- 6. TACK AREA OF MILLING
- 7. REPLACE TOP COURSE
- 8. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBBERIZED ASPHALT SEALANT
- 9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.

2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS (CON'T.)

TRENCH REPAIR SPECIFICATION RESIDENTIAL STREET

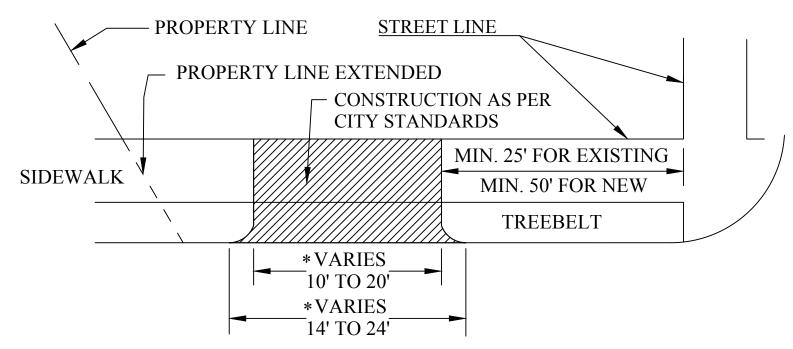


NOTES:

- 1. SAW CUT OUTER EDGE OF UTILITY PATCH
- 2. MILL TO REMOVE TOP COURSE
- 3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
- 4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM OF CROSS SECTION AS SHOWN ABOVE
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2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS (CON'T.)

TYPICAL RESIDENTIAL DRIVEWAY

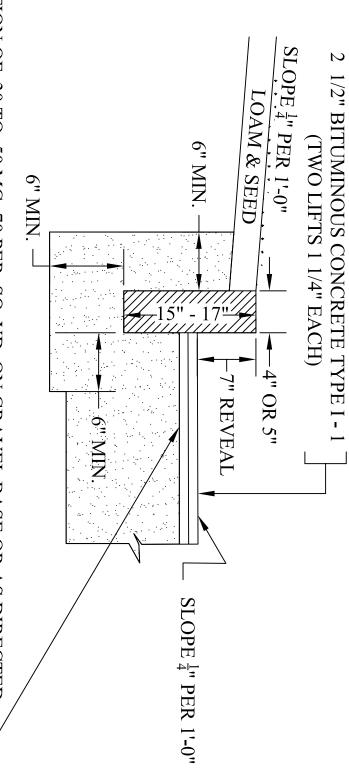


* WIDTH OF DRIVEWAY VARIES AS GEOMETRIC CONDITIONS ALLOW, DESIRABLE WIDTHS ARE 12' FOR A SINGLE AND 20' FOR DOUBLE DRIVEWAY

NOTES:

- STANDARD 2'-RADIUS CURB RETURNS SHALL BE UTILIZED
- ENTIRE DRIVEWAY INCLUDING 2'-RADIUS CURB RETURNS, MUST BE WITHIN THE PROP. LINES EXTENDED OF THE PROP. WHICH THE DRIVEWAY SERVES
- DRIVEWAY APRON MUST MEET SIDEWALK GRADE
- PORTION OF DRIVEWAY WITHIN THE PUBLIC WAY MUST BE CONSTRUCTED ACCORDING TO CITY SPECIFICATIONS
- IF ANY TREES, POLES, SIGNS OR UTILITIES ARE LOCATED WITHIN THE LIMITS OF THE PROPOSED DRIVEWAY, THE APPROPRIATE DEPARTMENT MUST BE NOTIFIED FOR REMOVAL OR RELOCATION OF SUCH
- CONDITIONS MAY TEND TO ALTER PROPOSED WIDTH AND LOCATION OF DRIVEWAY AND ANY VARIATIONS FROM THE STANDARDS SHOWN MUST BE APPROVED BY THE TRAFFIC ENGINEER

GRANITE CURBS

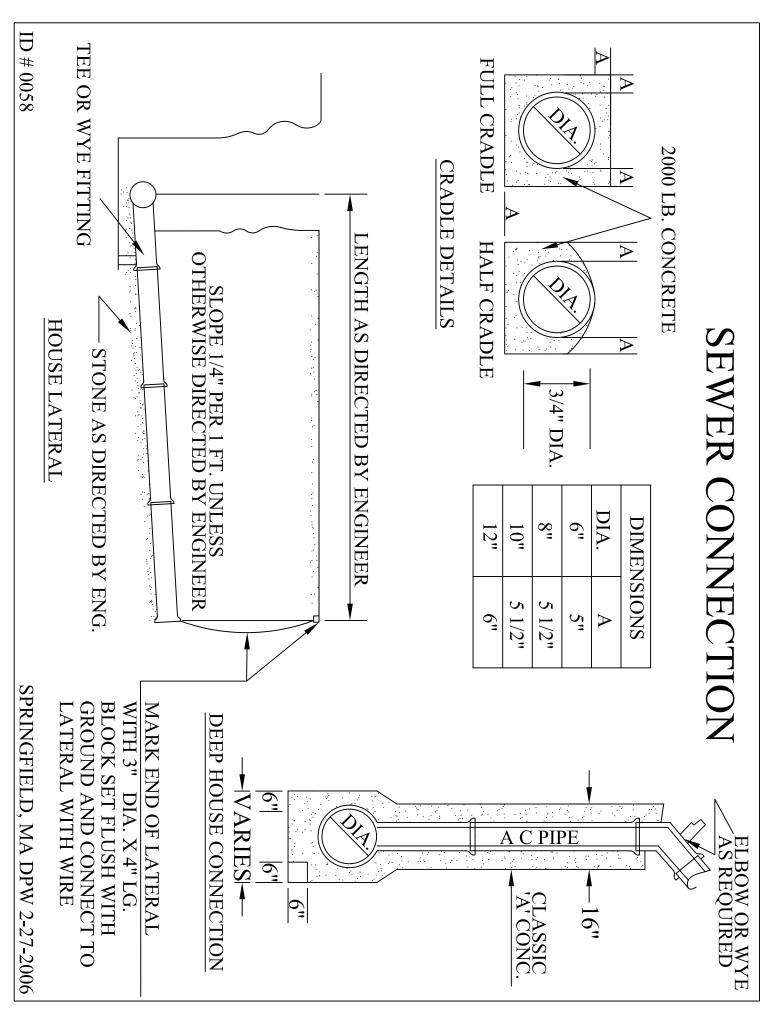


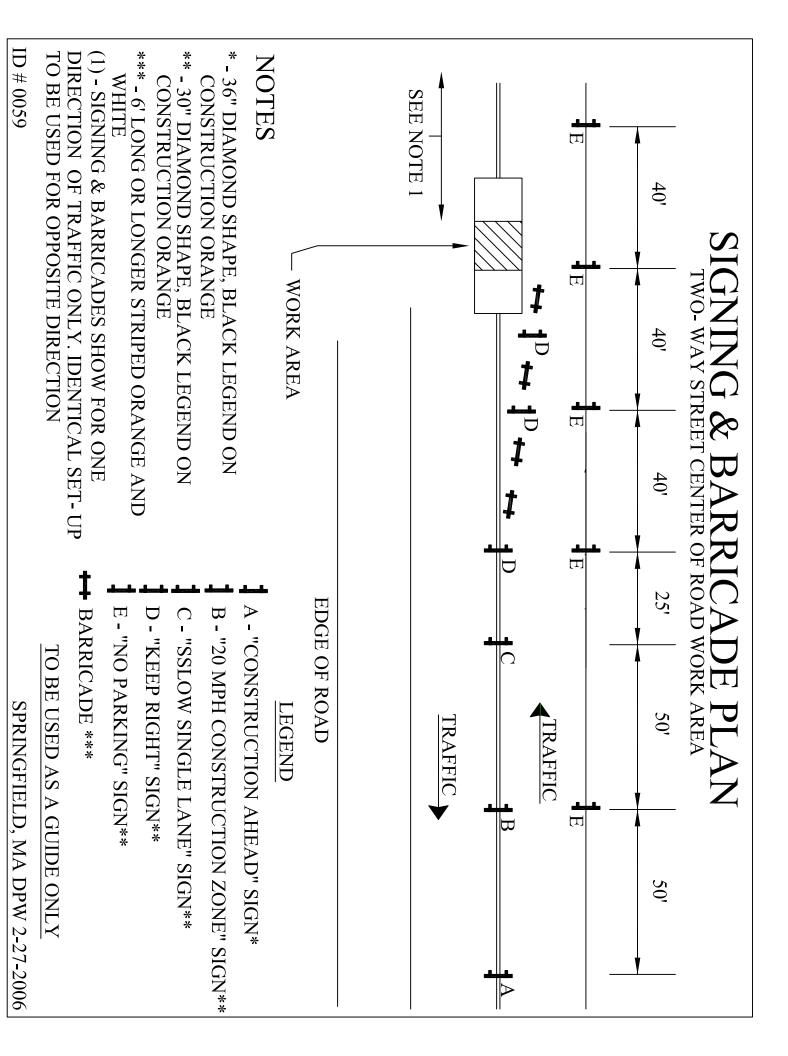
APPLICATION OF .30 TO .50 MC- 70 PER. SQ. YD. ON GRAVEL BASE OR AS DIRECTED

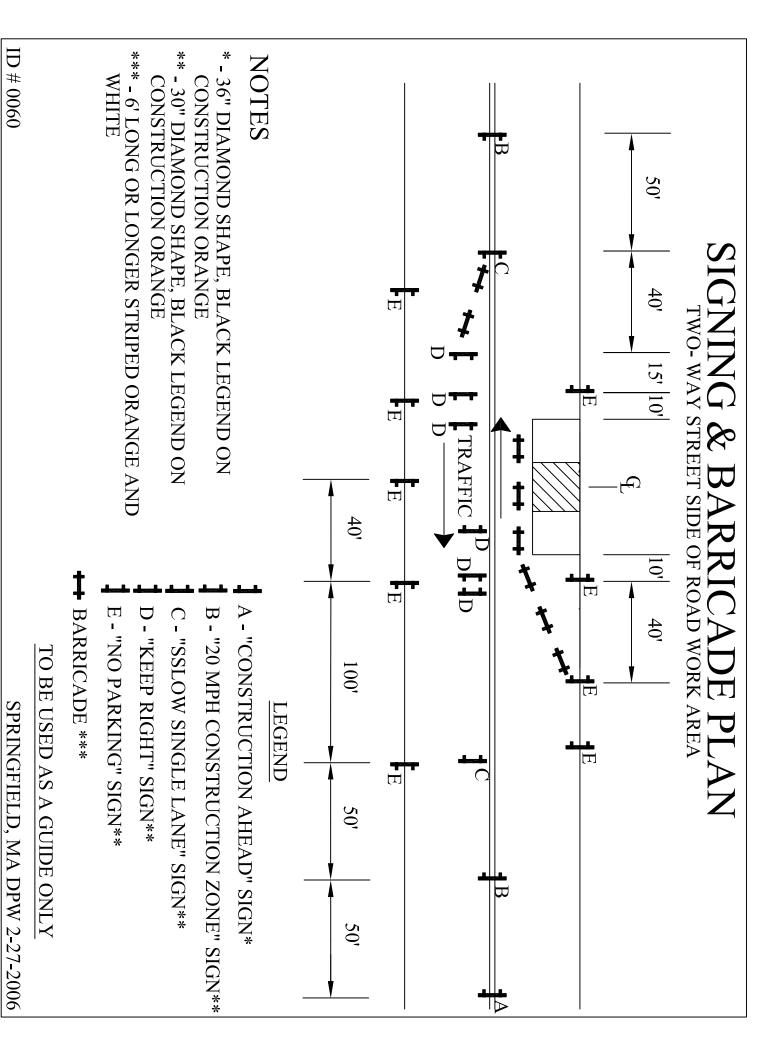
NOTES:

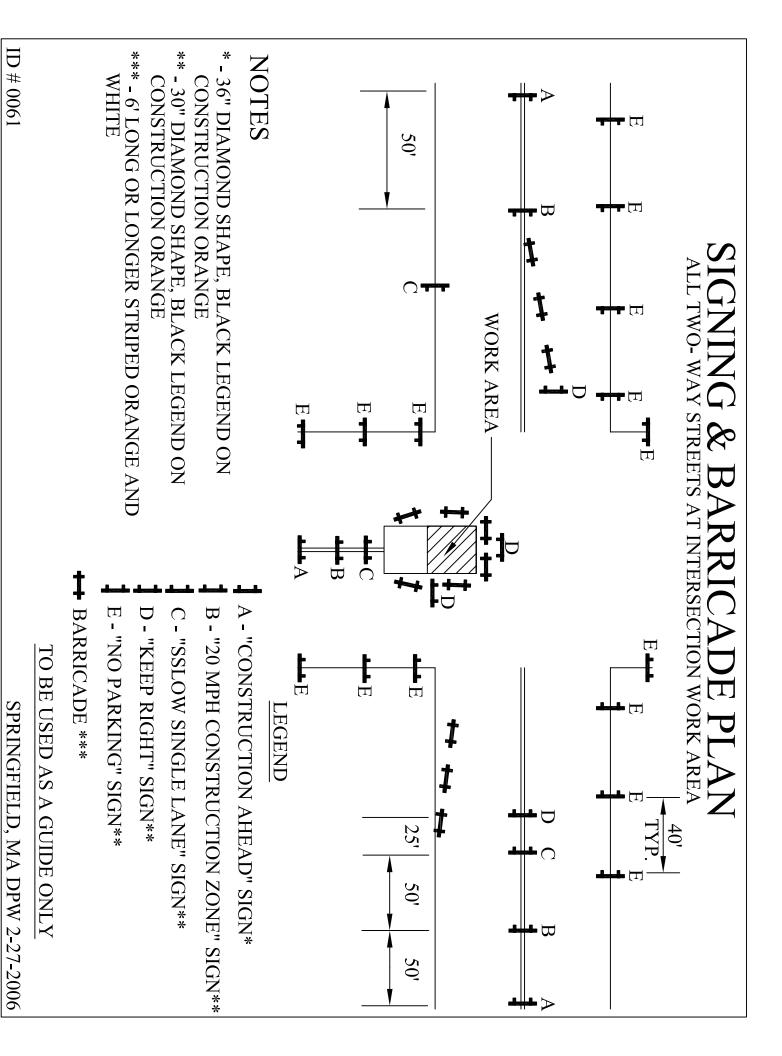
- TYPE VB, 4 "THICKNESS, MIN. OF 6' LENGTH GRANITE CURBING FOR RESIDENTAL STREETS TYPE VB, 5 "THICKNESS, MIN. OF 6' LENGTH GRANITE CURBING FOR ALL OTHER TYPES OF
- STREETS
- TYPE "A" GRANITE CURB CORNERS FOR ALL TYPES OF SUBDIVISION EXCEPT "ROUNDED CORNER CURBING" MAY BE SUBSTITUTED AT DESCRESTION OF THE DIRECTOR OF THE DEPARTMENT OF PUBLIC WORKS

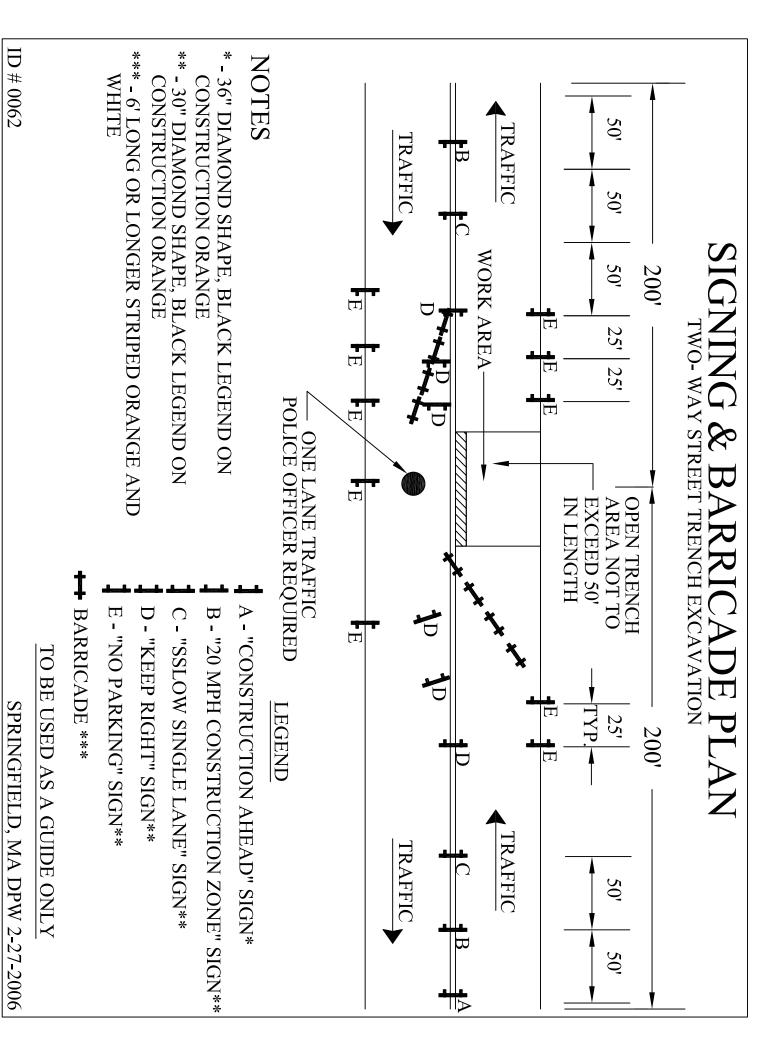
ID # 0057



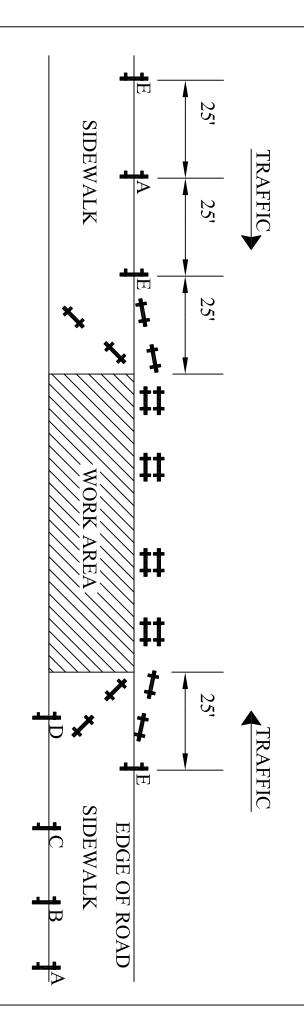








SIGNING & BARRICADE PLAN SIDEWALK & TREEBELT AREA



NOTES

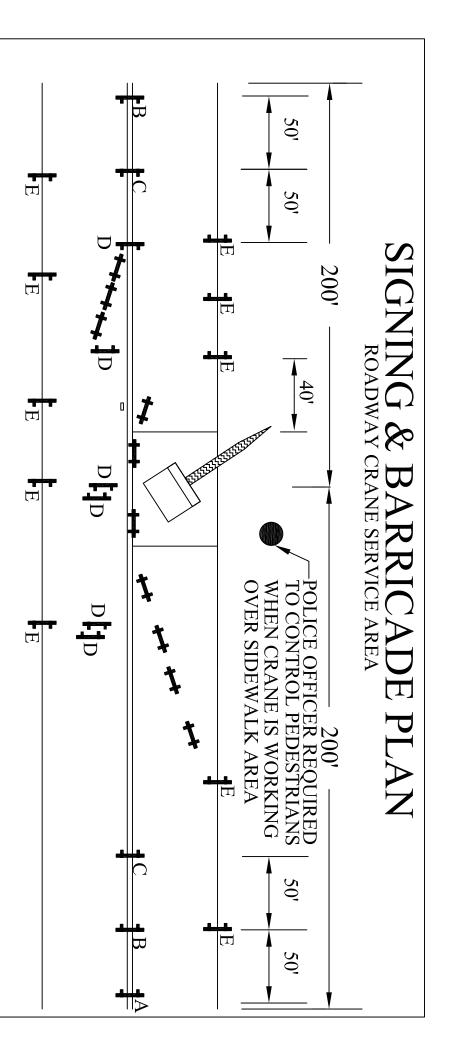
- * 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- ** 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- *** 6' LONG OR LONGER STRIPED ORANGE AND WHITE

LEGEND

- A "CONSTRUCTION AHEAD" SIGN*
- **B-"20 MPH CONSTRUCTION ZONE" SIGN****
- C "SLOW SINGLE LANE" SIGN**
- D "KEEP RIGHT" SIGN**
- E "NO PARKING" SIGN**
- **♣** BARRICADE ***

TO BE USED AS A GUIDE ONLY

SPRINGFIELD, MA DPW 2-27-2006



NOTES

- * 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- ** 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- *** 6' LONG OR LONGER STRIPED ORANGE AND WHITE

LEGEND

- A "CONSTRUCTION AHEAD" SIGN*
- **B-"20 MPH CONSTRUCTION ZONE" SIGN****
- C "SSLOW SINGLE LANE" SIGN**
- D "KEEP RIGHT" SIGN**
- E "NO PARKING" SIGN**

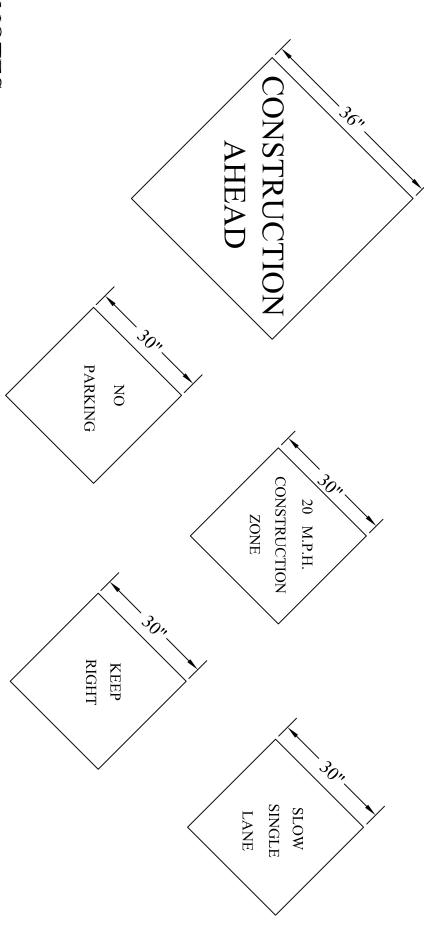
♣ BARRICADE ***

TO BE USED AS A GUIDE ONLY

SPRINGFIELD, MA DPW 2-27-2006

SIGN FACE DETAILS

THE NOTED SIGNS ARE AS FOLLOWS:

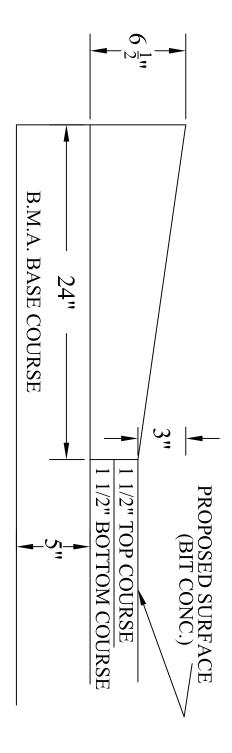


NOTES:

- ALL SIGNS SHALL BE BLACK LEGEND ON REFLECTORIZED CONSTRUCTION ORANGE BACKROUND
- ALL TRAFFIC AND / OR PEDESTRIAN DETOURS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROPRIATE PLAN AS CONTAINED IN THIS SECTION

ID # 0065

BERM TYPE A

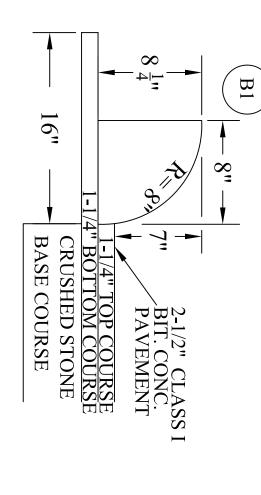


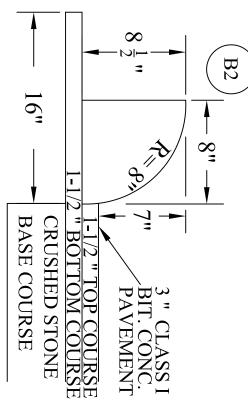
NOTES:

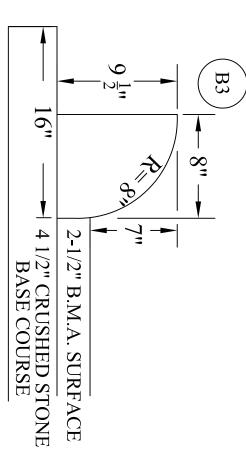
- USED PRIMARILY ON INTERSTATE PROJECTS

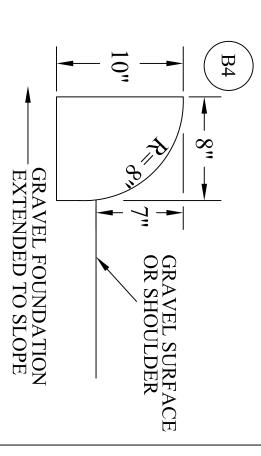
ID # 0066

BERM TYPE B



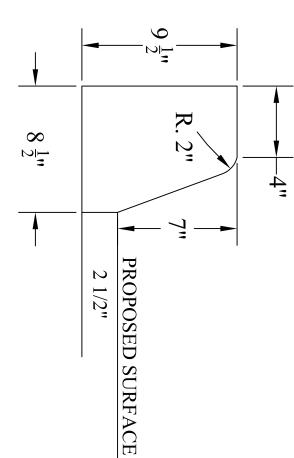






ID # 0067

BERM TYPE C MOST COMMONLY USED

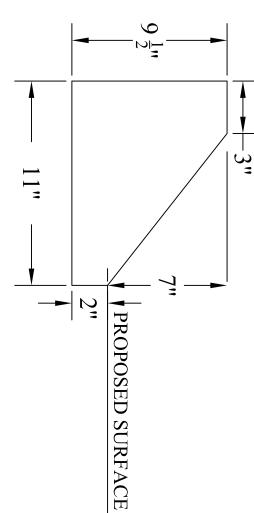


NOTES:

- METHOD OF CONSTRUCTION OF FOUNDATION FOR TYPES C AND D SAME AS FOR TYPE B DEPENDING ON KIND OF SURFACE

ID # 0068

BERM TYPE D

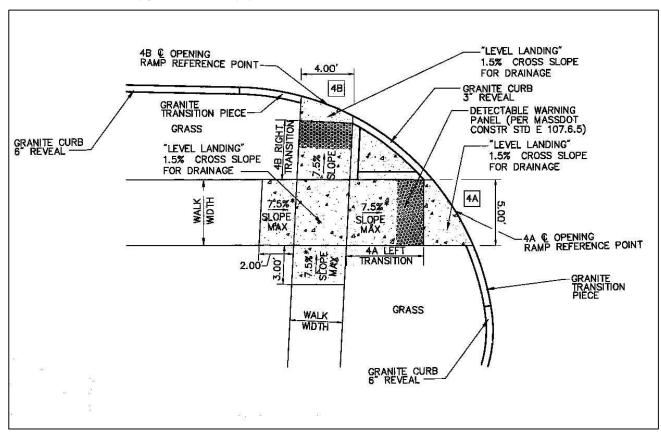


NOTES:

- METHOD OF CONSTRUCTION OF FOUNDATION FOR TYPES C AND D SAME AS FOR TYPE B DEPENDING ON KIND OF SURFACE

ID # 0069

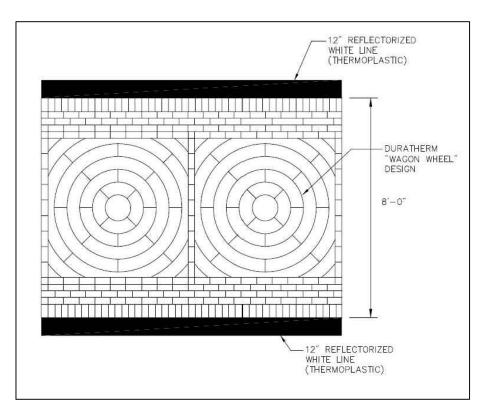
SIDEWALK REPAIR

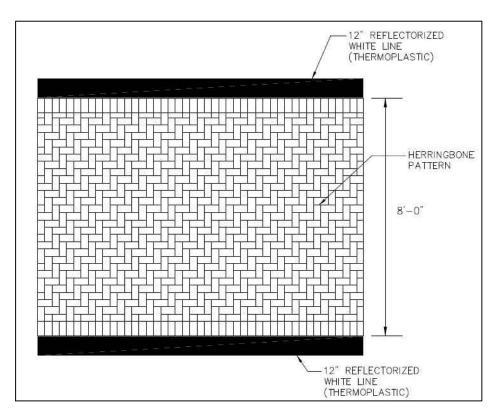


NOTES:

- IF EXCAVATION OCCURS ON A SIDEWALK AT AN INTERSECTION, CONTRACTOR IS REQUIRED TO REMOVE ENTIRE SIDEWALK WHEELCHAIR RAMP, ADJUST CURB, AND REPLACE TO CURRENT MASSDOT/A.D.A. GUIDELINES.
- IF NO CURRENT RAMP EXISTS, CONTRACTOR IS REQUIRED TO INSTALL RAMP AND ADJUST CURB TO MEET CURRENT MASSDOT/A.D.A. GUIDELINES.
- WIRE MESH REINFORCEMENT CONFORMING TO AASHTO-M55 OR ASTM A185-79 WILL BE REQUIRED.

IMPRINT OR INLAYED CROSSWALK REPAIR

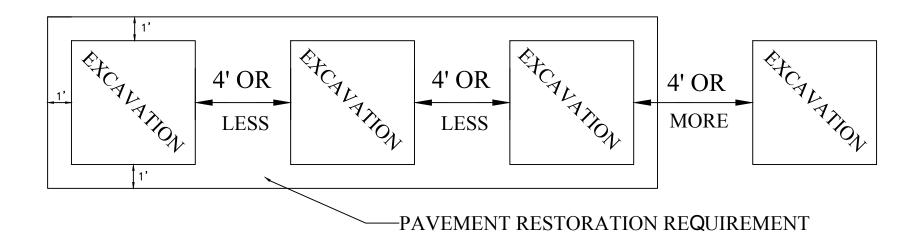




NOTES:

- IF ANY EXCAVATION OR SURFACE PAVEMENT IMPROVEMENT OCCURS OF ANY LOCATION WITHIN THE CITY OF SPRINGFIELD WHERE EXISTING IMPRINTED OR INLAYED CROSS WALKS EXIST, THE CONTRACTOR IS REQUIRED TO REPLACE INKIND WITH THE EXACT MATERIAL AND COLOR AS ORIGINALLY INSTALLED.
- INSTALLATIONS MUST BE COMPLETED BY AN INSTALLER APPROVED BY THE CITY OF SPRINGFIELD.
- ABUTTING PAVEMENT MARKINGS MUST ALSO BE REPLACED.

MULTIPLE EXCAVATION REPAIR

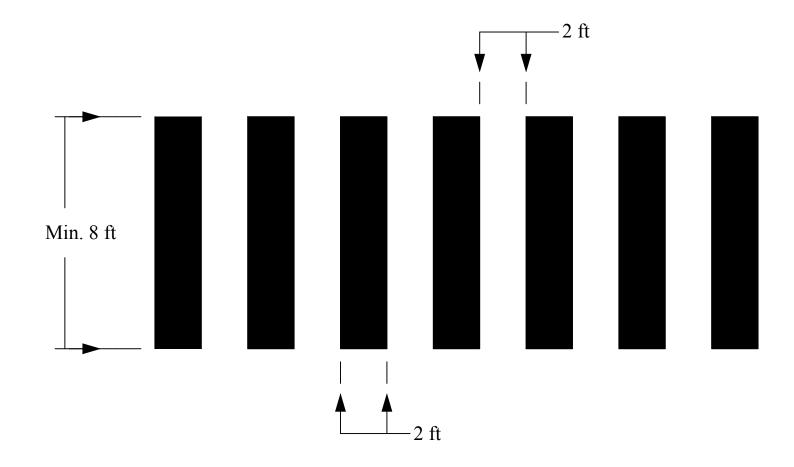


NOTES:

- APPLIES TO ANY ROADWAY EXCAVATION THAT RESULTS IN MULTIPLE PENETRATIONS PERMFORMED LESS THAN 4' OF ONE ANOTHER UNDER A SINGLE PERMIT.
- APPLIES TO ANY ROADWAY EXCAVATIONS THAT ARE PERMORMED WITHIN 2 MONTHS OF ANY OTHER PERMIT ISSUED TO THE SAME CONTRACTOR/UTILITY AT A SPECIFIC LOCATION.
- EXISTING PAVEMENT REMAINING SHALL BE MILLED AND OVERLAYED (1.5" RESIDENTIAL + 2" ARTERIAL) AS SHOWN ABOVE.

CROSSWALK DETAIL

CONTINENTAL STYLE



- CITY OF SPRINGFIELD STANDARD CROSSWALK DETAIL
- THIS DETAIL TO BE USED ON ALL NEW PAVEMENT PROJECTS
- ALL CROSSWALKS SHALL HAVE A MINIMUM WIDTH OF 8 FT

APPENDIX F Springfield DPW for Occupancy

City of Springfield Department of Public Works Engineering Division

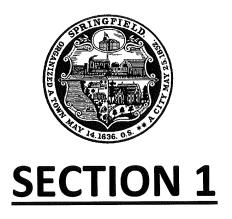


Manual for Occupancy of Public and Private Ways within the City of Springfield

June 5, 2017

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С	Street Excavation Permit Application Form	_
D	Restoration Details	
E	Mobile Food Truck Vendor Permit Application Form	



PERMIT OVERVIEW

SECTION 1 – GENERAL

The City of Springfield Department of Public Works (DPW) – Engineering Division has developed this "Manual for the Occupancy of Public and Private Ways within the City of Springfield" to assist the citizens, contractors and any other entity wishing to occupy and / or excavate within the right-of-way of any City designated public or private way.

This manual includes procedural outlines for obtaining necessary permits, identifies costs for applying for permits, as well as information on safety, surface restoration and final inspections.

Our goal as a City is to ensure that all activities completed within the City's right-of-way are done so in a safe manner and any excavations that occur include proper oversight, and that roads are properly restored to serve both the pedestrians and vehicles that use the City's roadways on a continual basis.

1-A INTENDED USE OF THIS MANUAL

The use of this manual is directed to all persons (general contractors, special maintenance and service people, special organizations, utility companies and municipal utility departments, city residents, etc.) that would, from time to time, have cause to utilize or occupy city sidewalks, tree belts, public roadways, private ways, City of Springfield right-of-ways and any other municipal and/or public property under the jurisdiction and regulation of the Springfield Department of Public Works. This manual pertains to activities both within areas identified as both public and private ways within the City of Springfield.

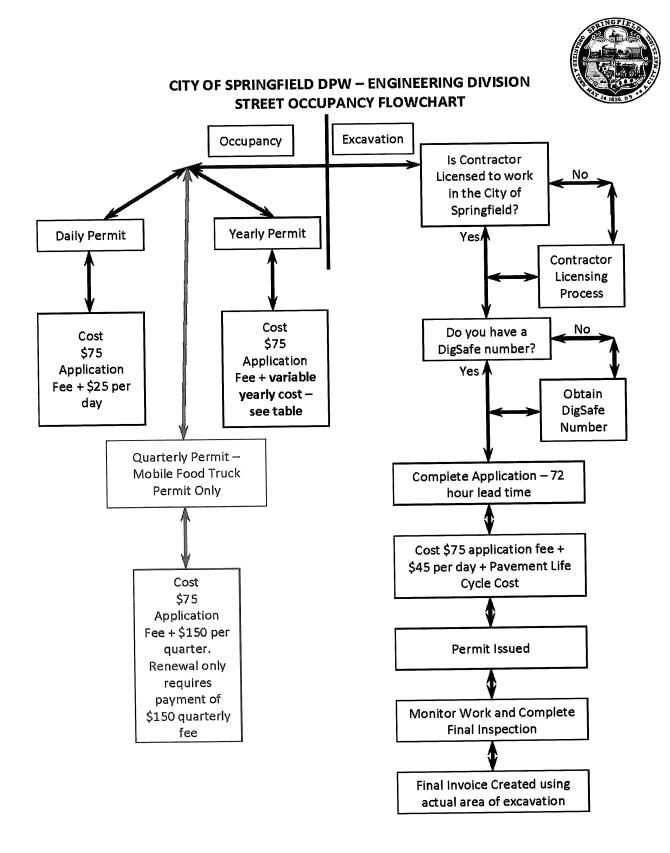
City of Springfield Street Permits fall under two categories: Street Occupancy Permits and Street Excavation Permits. The following identifies the processes required to obtain and maintain valid permits for the intended activities.

1-B PERMIT OVERVIEW

All persons who intend to occupy the public way for any reason must apply for and obtain a **Street Occupancy Permit** from the Department of Public Works – Engineering Division. All persons intending to perform excavations within public ways will require a **Street Excavation Permit**. The application requirements for each of these permits are discussed in other sections of this document. See also the Occupancy Permit Flowchart on page 6.

Section 40, Chapter 502 of the General Laws of the Commonwealth of Massachusetts requires all persons who are subject to applying for said license (Street Occupancy Permit or Street Excavation Permit) must establish at least a seventy-two (72) hour advance notification of any excavation within the public way, unless so noted for certain permits.

An information packet and appropriate applications for either a Street Occupancy or an Excavation Permit may be obtained at the Department of Public Works – Engineering Division, located at 70 Tapley Street, Springfield, MA at any time during normal working hours. An application for permit will be accepted in the DPW – Engineering Division from



7:00 a.m. to 2:00 p.m. with a proper application. The <u>approved Colored Occupancy Permit Card</u> issued by the DPW - Engineering Division must be posted at the job site in a location that is visible to a City Inspector and / or City Police. In those cases where a posting is not feasible, (i.e. parade) the Permittee, or his/her representative, must be present and must have the Street Occupancy Permit on his/her person. Not properly being able to produce a valid Occupancy Permit, may cause the City to revoke any approved permit.

If, at any time during the period covered by an approved permit, emergency conditions prevail which would invalidate the requirements of the original permit, the Department of Public Works – Engineering Division must be notified immediately regarding either modifying the existing permit or issuance of a new permit.

If, at the discretion of the Department of Public Works – Engineering Department, a sketch and/or detailed survey plan may be required to properly define the area and extent of the occupancy including roadway or pedestrian detour routes, the applicant shall furnish same accompanying the information sheet for street occupancy license.

1-C APPLYING FOR A STREET OCCUPANCY PERMIT

All individuals, companies, businesses, contractors, or any other entity that wishes to occupy any portion of the City designated right-of-way on a public or private way, must apply for a "Street Occupancy Permit". Appendix A within this document includes a "Street Occupancy Permit Application Form". This form is also available at the DPW – Engineering Division at 70 Tapley Street in Springfield.

Events such as parades, block parties, political rallies, religious events, road races, etc., fall under our event permit category, while placement of dumpsters, cranes / lifts, delivery of materials or building services fall under our work permit category. Contractors, individuals, etc. who apply for a work permit must submit copies of Certificates of Insurance as part of the permit application process. In applying for both types of permits, the permit application fee is \$75, and an additional fee of \$25 per day of occupancy. In both instances it is the permittee's responsibility to ensure that the DPW - Engineering Division is notified if occupancy extends past the dates identified on the granted permit. It is also the permittee's responsibility to notify the DPW - Engineering Division that the permitted activities are complete so that a final inspection can take place.

Individuals and / or entities who wish to apply for a Mobile Food Truck Vendor permit will be required to fill out an application located in Appendix E of this document. Specific requirements and / or restrictions for the approval of a Mobile Food Truck Vendor permit and discussed in Section 1-D-1 and 1-F of this document.

For street occupancies that occur on a more regular or constant basis, the City has included an option of obtaining a yearly permit. This permit would allow utility companies, contractors, etc. to perform work within manholes and / or vaults that do not require excavation, without having to obtain an individual permit. These entities still have a requirement to notify the Department of Public Works to obtain specific approval for a proposed location, and provide the Department with a traffic control, if necessary. Businesses, companies, etc. that have

overhangs, signage, kiosks, etc. that occupy a public way must also apply for a yearly permit. The cost for various types of Yearly Occupancy Permits is shown on page 15 of this document.

In all cases, the entity that will be occupying the public way is the entity that is required to obtain the permit. For example, a building owner or property manager cannot obtain a permit for a contractor performing work at their site. Mobile Food Truck Vendor Permits do not qualify under the yearly permit category.

1-D-0 STREET EXCAVATION PERMITS

The City of Springfield has updated its requirements for street excavation permits. Applicants must meet all requirements prior to applying for a street excavation permit.

1-D-1 BECOMING A LICENSED CONTRACTOR IN THE CITY OF SPRINGFIELD

Prior to being able to apply for a street excavation permit, applicants are required to become a "licensed contractor" in the City. Application forms and required submission material are located in Appendix B of this Document. No excavation permits can be processed until a contractor is determined to be fully licensed. Applications for contractor licensing approval and excavation permits applications for the same contractor will not be processed simultaneously.

Licensed contractor status is in place for a given calendar year only and every contractor must re-apply for approved status each year. It is the City's intent to notify all licensed contractors in the fall of each year to remind them to re-apply for the upcoming year, however, it is the Contractor's responsibility to ensure that all required submissions are made, and all material on file with the City is up to date. Contractor's submitted insurance certificates and or/ bonds that expire during the course of a calendar year must by updated as required showing compliance for the remainder of the calendar year. A contractor whose insurance certificate/ bond that is out of date will not be considered to be in approved status.

Please be advised that the DPW – Engineering Division does not have the ability to waive any of the requirements outlined in the application process, especially related to insurance and / or bonding requirements. Given the material required to be submitted, the process involved for approving a given contractor may take an extended period of time. Please consider applying early in a given year to ensure that excavation permits can be issued in a timely basis.

Please be advised that contractor's who continuously fail to follow required standards or any requirements of a particular permit, may have their "approved contractor" status revoked by the Department of Public Works that will bar them from performing work within the City of Springfield until approved by the Director.

Mobile Food Truck Vendors applying for a permit will be required to submit Certifications that the vehicle has passed all necessary inspections required by the Springfield Fire Department, City's Health and Human Services Department, obtained a Hawker and Peddlers license from the Springfield Police Department, and has a valid Certificate of

Insurance providing general liability insurance listing the City as an additional insured, and a copy of the Vehicle's Registration. Vehicles must be registered in the State of Massachusetts. Out of State registrations will not be allowed. Other required materials needed as part of the application are listed on the application in Appendix E of this document.

1-D-2 DIGSAFE

All excavations occurring in the City of Springfield require that DigSafe notification be completed. The City of Springfield is now part of the DigSafe notification program and will have access to all notices applied for in the City. Contractors will not be able to apply for an excavation permit until a DigSafe number has been applied for and obtained. It should be noted that the Springfield Water & Sewer Commission is not part of the DigSafe program, and will have to be notified directly by the applicant regarding mark-out of those utilities.

1-D-3 APPLYING FOR A STREET EXCAVATION PERMIT

Once a contractor has obtained "licensed contractor" approval status, a street excavation permit can be applied for. Applicants should be made aware that applications for contractor licensing approval and excavation permits applications for the same contractor will not be processed simultaneously.

Permits must be applied for by the entity that is performing the actual excavation. An owner, property manager, construction manager, etc., cannot apply for a permit on behalf of another entity. Any entity who obtains a permit, then has a different entity perform the actual work, will cause both entities to be in violation of the City's Occupancy Permit program and both entities will be subject to fines. Under no circumstances will the City process separate permits for contractors to perform separate segments of work at a single location. (i.e. One contractor performs excavations and pipe repair, and another contractor perform surface restoration). The contractor applying for an excavation permit must be the contractor responsible for trench repair and surface restoration.

Any and all utility companies who perform their own work will apply for the permit in the name of the utility company. Utility companies who have contractors perform work for them are required to apply for, and obtain the permit in the name of the contractor performing the work. All non-emergency activities will require that an actual permit be on site at the time of the excavation and 72-hour application notification be adhered to. Any utility company that applies for a permit in the utility's name then has a contractor perform the work, must notify the City prior to the work in order that the permit can be modified. If the City is not notified, the contractor in the field will be issued a stop work order and be subject to fines until a proper permit can be obtained.

The City of Springfield has been part of the DigSafe notification program since 2012 and will have access to all notices applied for in the City. Contractors will not be able to apply for an excavation permit until a DigSafe number has been applied for and obtained. The City of Springfield under Section 40, Chapter 502 of the General Laws of the Commonwealth of Massachusetts, requires all persons who are subject to applying for an excavation permit

must apply for a permit at least a seventy-two (72) hour advance for any excavation within the public way.

Appendix C of this document outlines the requirements for obtaining an excavation permit in the City of Springfield. The City requires a completed application form, a location map / sketch to best identify the location, as well as a sketch that shows the approximate limit of excavation in order to determine life cycle pavement cost. A final sketch will be prepared by the City of Springfield and a revised bill will be sent to the contractor if the actual excavation ends up being larger than stated in the application. Applications that do not include a sketch cannot be processed and sketches must show limit of excavation along with limit of "T" patch.

Contractors are required to notify the DPW – Engineering Division if excavation extends past the dates specified on the permit. The Contractor is also responsible for contacting the DPW – Engineering Division for notification that work is complete. Failure to notify the DPW – Engineering Division will result in additional "per day" fees being charged to the contractor. If the contractor fails to notify the DPW – Engineering Division that a project has extended past the closing date of an existing permit, will be required to apply for a new permit and pay new fees, at a minimum, or at the discretion of the Director, may be issued a fine for working without an approved permit.

1-E PROCEDURE FOR YEARLY PERMIT APPLICATIONS

In order to more easily facilitate occupancies that occur on a more regular or permanent basis, the City of Springfield Department of Public Works – Engineering Division has developed a yearly permit that will allow a person / company and / or utility to obtain a blanket permit on a yearly basis. Items such as signs or awnings, permanent monitoring wells, Valet Parking, overhead utility related work, tree work, etc., all fall under the City's Yearly Occupancy Permit requirement. The process for applying for and obtaining a yearly permit is as follows:

- 1. <u>Letter of Application</u>: Submit a letter of application to the Director of the Department of Public Works. If opening a new business, the applicant must also register at the City Clerk's Office. For example, the letter of application must state the location, size, color, height and type of mounting, etc, for a proposed sign occupancy permit.
- 2. <u>Necessary Forms</u>: When the Director, or his designee, approves the application letter, the Department supplies Bond Forms and Application Forms to be completed by the person applying for the permit. Sample copies of both these forms may be obtained from the Department of Public Works, 70 Tapley Street.
- 3. <u>Permit to Place and Maintain a Canopy Projecting Over a Public Way</u>: The application forms for this permit must be submitted to the City Council for approval.

The Bond Forms must be completed by the applicants' insurance company and returned to the Department with a record of the Bond Number (actual Bond remains with the insurance Company).

- 4. <u>Yearly License Permit and Bill</u>: When the above steps 1, 2, and 3 have been completed, both a Yearly License Permit and the bill for this permit can be obtained from the Department of Public Works Engineering Division, 70 Tapley Street. A sample copy of the permit or license may be obtained from the Department of Public Works Engineering Division.
- 5. Annual Renewal of Yearly License: Once a yearly Permit or License has been issued, it must be renewed each year and a new Permit or License Forms completed by the Applicant. The annual renewal process is automatically done by the Department upon expiration of each License. Copies of the renewal letters may be obtained from the Department upon expiration of each License. Copies of the renewal letters may be obtained from the Department of Public Works Engineering Division.
- 6. <u>Blanket Manhole Yearly Permit</u>: Any holder of such permit will notify the Department at least 72 hours in advance of occupying any primary or secondary arterial street. Failure to do so may result in the blanket permit being revoked. A street occupancy permit would then have to be applied for on a day-by-day basis for each location subject to the daily rate. Any entity that obtains a yearly permit to work in any location within a street is still required to contact the DPW Engineering Division to inform that City that work will be occurring and a determination will be made if additional signage and / or detours may be required. The 72-hour notification rule also applies to this work.

1-F Mobile Food Truck Vendor Permit

The general goal of this section of the manual is to provide guidelines for Mobile Food Truck Vendors to operate on a regular and legal basis throughout the City of Springfield. The following outlines how occupancy permits will be issued, managed and what requirements the individual vendors will be required to adhere to. The requirements are as follows:

- 1. Items listed in this document are under the control of the City of Springfield Code, Article VII of Chapter 279: Mobile Food Trucks of the City Ordinances.
- 2. The provisions of this section shall not apply to canteen, coffee, or ice cream trucks that move from place to place and are stationary in the same location for no more than thirty (30) minutes at a time or food vending push carts and stands.
- 3. The provisions of this section shall not apply to mobile food operations that receive a temporary one-time event permit issued by the Health and Human Services Department or any other Department within the City.
- 4. A Mobile Food Truck shall mean a food establishment that is located upon a vehicle, or which is pulled by a vehicle, where food or beverage is cooked, City of Springfield DPW / Engineering Division Page 11

- prepared and served for individual portion service, such as a mobile food kitchen. Independent push cart entities that are not towed are not allowed to occupy and roadways for the sale of any items at any times
- 5. Hours of Operation: 7:00 a.m. to 1:00 a.m.. No sale or giving away of any product may occur outside of the hours of operation. Mobile Food Trucks may occupy the permitted space no more than one-hour prior to and / or one-hour after the stated hours of operation. Under no circumstance shall any mobile food vendor be allowed to leave / park any Mobile Food Truck on the street in the City of Springfield in the approved space or at any other location outside of the hours stated above. The mobile food truck will not be allowed to occupy a permitted space if it is not open for business.

6. Location:

- a. Mobile Food Truck Vendors will be only be allowed to operate within a paved roadway, unless otherwise approved by the Director. Under no circumstance will a mobile food truck vendor be allowed to operate on other areas of City Rights of Way including sidewalks and non- paved areas.
- b. Mobile Food Truck Vendors will not be allowed to operate within or abutting any residentially zoned area, or within 500' of any residentially zoned area.
- c. Mobile Food Truck Vendors will only be located within existing designated parking spaces and vehicles cannot exceed 20' in length in non-striped parking spaces and vehicles cannot exceed the designated length in striped parking spaces.
- d. Mobile Food Truck Vendors will not be able to be located within 500' of any "bricks and mortar" food establishment properly permitted and regulated within the City.
- e. The City will designate specific areas within the downtown area when specific locations and / or limitations of locations for the use of food trucks are deemed appropriate. The listed requirements on locations apply for all proposed locations within the City.
- f. A vendor can apply for a specific location (currently approved parking space) within the City, or for one of the designated locations (currently approved parking space) within the Downtown Area at any time. The DPW will act on an application within 21 days. Reviews of applications may also be required by the Fire Department, Police Department, Park Department and / or the Health and Human Services Department. The applicant is required to obtain all other permits prior to submitting application to the DPW. Permits will be issued in 3 month increments (June August; September November; December February; & March May). If a location is approved, the DPW will install specific signs for that parking space indicating "Mobile Food Truck Vendor Parking Only".

- g. The Downtown Area shall mean the area of the City of Springfield whose western boundary is the Connecticut River, whose eastern boundary Chestnut Street, whose northern boundary is Liberty Street and whose southern boundary is Union Street. Within the Downtown Area there shall be no more than ten (12) permits granted at any one time pursuant to this chapter. The permits shall be issued in the following manner:
 - I. Six (6) permits may be issued for the parking spaces located at Riverfront

 Park
 - II. Six (6) permits may be issued for the parking spaces located on Lyman Street and Kaynor Street.
- h. Vendors who obtain a permit will have "first rights" to their existing permitted space as long as a new permit or permit extension is applied for at least 30 days prior to the expiration of an existing permit. This new permit or extension will required resubmission of all previously submitted documentation as well as payment of additional fees.
- i. If a the mobile food truck is towed to the location by another vehicle, the mobile food truck must be detatched immediately and any vehicle towing the mobile food truck must then adhere to all parking rules and regulations of the City of Springfield. The towing vehicle is not covered as part of the permit and cannot be parked in the permitted space.
- 7. Utilities: All utilities required by the Mobile Food Truck must be self- contained and / or mounted to the vehicle and under no circumstances will any external connections be allowed (i.e. power extension cords, portable lighting, etc.) to any remote or adjacent location. Power generators must be contained in, or attached to the mobile food truck. Portable generators will not be allowed to be placed on the street, road, sidewalk, etc.
- 8. Condiments, plates, silverware, cartons, napkins, etc. must be stored at all times on or within the mobile food truck. Free standing tables, kiosks, etc. for placement of items list is not allowed.
- 9. All trash generated by the mobile food truck or any patron of the mobile food truck is the responsibility of the mobile food truck vendor. Proper trash receptacles must be provided by the vendor. The vendor has the responsibility to keep the immediate area, including street and sidewalks, of the permitted space clean of trash at all times. Trash must be properly bagged and must be removed from the location by the vendor at the close of business every day. The City of Springfield will not be responsible for the removal of any trash generated by the vendor. The vendor is not allowed to pile trash, bagged or otherwise, on the street or sidewalk at any time. Vendor who do not properly dispose of trash at the end of every day may have their permit either suspended or revoked.

- 10. Mobile Food Truck Vendors will not be allowed to place any chairs, tables, kiosks, or other items around their vehicles.
- 11. No external speakers for announcements, playing of music, etc. will be allowed. Any and all noise generated by the mobile food truck will be monitored for proper compliance.
- 12. Mobile Food Truck Vendors must also comply with any and all Temporary Parking Restrictions imposed by the City of Springfield. (i.e. Street Cleaning, Construction, Snow Emergencies, etc.) Depending upon the Circumstance, the City may provide an alternate location for the vendor.

1-G-0 PERMIT FEES AND REQUIREMENTS

The following section details the City of Springfield's permit fees and requirements.

1-G-1 PERMIT FEE CALCULATIONS

In order for the City to be able to maintain our streets and avoid un-necessary excavations, the City has established the following that outlines the cost of obtaining a permit.

OCCUPANCY PERMITS

	ltem	Cost
Daily Permit	Permit Application Fee	\$75 per application
•	Daily Occupancy Fee	\$25 per day
Yearly Permit	Public Utility	\$1,000 per year
	Awning/ Canopy/ Sign	\$75 per year
	Parking / Delivery/ Emergency Services	\$75 per year
	Permanent Monitoring Well	\$40 per year
	General Obstruction (Yearly)	\$75 per year
	Public Services	No Charge
	Marvin Street Residential Parking	\$100 per year
		\$2.50 per LF plus meter
	Valet Parking	fees
		\$75 Permit Fee +\$150 per
Quarterly Permits	Mobile Food Truck Vendor Permit	quarter or portion thereof.
		\$150 per quarter Permit Renewal if application submitted 30 days or more prior to end date of existing permit

EXCAVATION PERMITS

Item Cost

DPW Contractor License	Application Fee to become DPW Licensed Contractor	\$125 per application
Daily Permit	Permit Application Fee	\$75 per application \$45 per day
	Daily Inspection Fee	φ45 per day
Yearly Permit	Private Property Trenching	\$75 per year
Life Cycle Fee	Pavement 3 years old or less No Excavation Allowed except on an emergency basis or with DPW Director / Designee Approval	\$120 per sf if allowed
	Pavement 4 or 5 years old. Pavement greater than 5 years old but less than 10 years old	\$65 per sf \$30 per sf
	Pavement more than 10 years old	\$15 per sf

Notes:

- 1. The City of Springfield has a 3 year moratorium on excavation within all city streets and a 5 year moratorium on excavation within City, State or Federal funded roadway reconstruction projects. The designation of a particular street as to a 3-year or 5-year excavation moratorium is at the sole discretion of the Department of Public Works.
- 2. The City of Springfield will use a date of September 1 as a paving date for all roadways paved / overlaid in a given year, if an exact date is not available.
- 3. Square foot calculation for life cycle fee will be based upon information / sketch provided by the applicant. Calculation of square footage will include area for overlap "T" joint repair. Final Calculation of pavement area to occur at final inspection

The Director of Public Works or his designee possesses the ability to waive the Life Cycle Payment Fee for any utility company or other party if the utility, or other party, can demonstrate to the Director their ability to satisfactorily maintain the pavement in question. For the purpose of this ordinance, a "Utility Company" is defined in Massachusetts General Law Chapter 25, Section 3.

- 1. The Utility Company or other party must have real property and/or facilities located in Springfield assessed at \$5,000,000 or greater.
- 2. The Utility Company or other party shall possess or prove the ability to obtain the necessary personnel and equipment to satisfactorily repair and/or maintain the roadway surface in accordance with this and all other pertinent ordinances.
- 3. Any Utility Company that has a Pavement Life Cycle Fee waived for any reason, will be responsible for the maintenance and repair of the excavation and surface roadway moving forward until a point in time where the City resurfaces / paves / repairs the roadway.

If a contractor does not meet the above stated criteria and, seeks a waiver of the Life Cycle Pavement Fee the following must be complied with:

- I. A roadway reconstruction plan must be submitted and approved by the Engineering Division.
- II. The roadway area affected by the excavation, curb to curb, must be removed and properly discarded.
- III. The gravel base must be brought to grade and properly compacted.
- IV. 3 inches of bituminous concrete (or other thickness designated by the Department of Public Works) shall be placed by machine and properly rolled according to Massachusetts Department of Public Works Standards.

1-G-2 CONTINUITY OF VEHICULAR / PEDESTRIAN TRAFFIC

Under normal conditions (i.e. any occupancies between the hours of 6:00 a.m. and 5:00 p.m., Monday through Friday) at least one normal travel lane for moving traffic must be maintained at all times, unless otherwise noted on permit. The licensee will be required to coordinate activities with the Springfield Police Department to determine if police services are required for the safety of pedestrians and the driving public, over and above any requirements stated by the Engineering Division as part of the permit. Occupancies of City Rights-of-way that require total or partial closing of the roadway to vehicular traffic may, at the discretion of the Department of Public Works, be restricted to hours outside of the "normal conditions" to ensure public safety. If it becomes necessary to close a road for excavation and / or repair at any time, the contractor is required to contact the Department of Public Works - Engineering Division to initiate the road closure process. The contractor must provide the DPW with a copy of the road closure notice prior to the intended closure to ensure that proper coordination with other departments can be made. Additionally, the contractor may be required to submit a "Detour Plan" for approval by the DPW -Engineering Division. Please be advised that a minimum of 72 hour notice must be given by Contractor to the City prior to the closure of any roadway so that proper notification to the public can be made. Please be aware that a Police Officer working the detail does not have the authority to close a roadway without the approval of the Department of Public Works.

Unless otherwise approved or in the case of an emergency situation, all work to be performed within the public way in the "Downtown Business District" and the "X" Business District shall be performed between the hours of 6:00 p.m. and 6:00 a.m. The "Downtown Business District: is defined as the area that is bounded by the "Arch" on the northerly side, State Street on the southerly side, East Columbus Avenue on the westerly side and Dwight Street on the easterly side. The "X" Business District is the area defined by Sumner Avenue from Cliftwood Street to Ormond Street, Dickinson Street from Grenada Terrace to Cliftwood Street, Belmont Avenue from Burlington Street to Ormond Street. Work in other areas may also be restricted to the above mentioned hours at the discretion of the Director of Public Works.

Wherever sidewalks exist, pedestrian passage ways (unless otherwise approved or in an emergency situation) must be maintained at all times via either existing sidewalks or approved methods of detours. If sidewalk must be closed for any reason, proper signage and barricades as discussed in section 2-H of this document must be followed.

1-G-3 POLICE OFFICERS

Whenever required by either the Director of Public Works, or his designee, or as a condition of the Street Occupancy / Excavation Permit, police officers for traffic and/or pedestrian control are to be furnished <u>at the expense of the Permitee</u>.

Upon arriving on any occupancy / excavation work within the City right-of-way in which police services are required, the police officer assigned will be required to inspect the permit issued by the Department of Public Works – Engineering Division. If a proper permit has not been obtained, the work area will be shut down and secured until a proper permit is obtained. Fees for police services will still be required to be paid based upon the hours requested by the permittee / contractor.

Please be aware that detail police officers do not have the authority to close roadways. If an officer requests that a roadway be closed, it is the contractor's responsibility to contact the Department of Public Works and obtain the necessary approvals.

1-G-4 REVOCATION OF PERMIT AND OR LICENSE

A Street Occupancy Permit may be revoked at any time by the Director of the Department of Public Works, or by his designee, if the Permittee is in violation of any of the rules and regulations either set forth herewith or as a condition of the permit, or if a dangerous and / or unsafe condition arises that would jeopardize the safety of the general public resulting from poor construction procedures and practices, or if the Licensee does not resolve a hazardous condition in a reasonable length of time, after being instructed to do so by the Department of Public Works, the issued license may be revoked..

The license revocation may be appealed by the Permittee through a hearing and review by the Director of Public Works or his designee.

If a permit is revoked, the contractor is required to stop work immediately, and secure the work site. The permit will be reissued once the site, in the opinion of the DPW Director or his designee, has been deemed safe for work to continue. The contractor will be liable for all "per-day" fees during the time of any work shutdown.

1-G-5 DURATION OF LICENSE / PERMIT

The Permittee shall not allow his original Street Occupancy License to expire before the work area in the public way is completely clear of all construction material and equipment so as to be safe for normal use by traffic and pedestrians, and/or the public way has been restored to its condition prior to execution of any work authorized by said Permittee.

The Department of Public Works – Engineering Division shall charge a fee for the occupancy of a public way. The fee is based on a per-day rate as established, approved and passed by the Springfield City Council. Each day that the occupancy is in effect shall be calculated in the total amount, including Saturday, Sundays and all Holidays. The number of days required for the occupancy must be estimated by the applicant as close as possible. Extensions of the original permit may be applied for, but no abatements or refunds for over estimating will be issued. Permittees whose occupancy are not completed within the period of times identified on their permit, and who have not notified the Department of Public Works – Engineering Division of the extension, will be charged will be charged at the day rate, and / or may be liable for additional permit fees if so determined by the Director.

Mobile Food Truck Vendor permit will be issued for three month period as follows:

- June 1 August 31
- September 1 November 30
- December 1 February 28 (29)
- March 1 May 31

Mobile Food Truck Vendor permits will not be issued for any partial periods less than three months and extensions for permits will not be issued for partial time frames less than three months.

Mobile Food Truck Vendors who obtain permits but do not occupy the designate space for any 30 day period will have the permit voided and an entire new application will be required.

1-G-6 FINAL INSPECTION

Upon completion of any excavation, replacement of concrete sidewalk and/or roadway or driveway, or any other permitted occupancy / excavation, the Permittee shall notify the Department of Public Works to make a final inspection of the area / construction to determine that all permit requirements have been complied with. The Street Occupancy Permit and associated fees shall continue in effect until such inspections are made and approval is obtained. Permittees who do not notify the Department of Public Works – Engineering Division regarding completed work will be held liable for all daily fees until notification is completed.

Any deficiencies found during this inspection shall be corrected by the Permittee. Should any deficiencies not be corrected by the Permittee, the Director of Public Works or his designee may, may at his discretion, cause any repairs to be made with city forces at the full expense of the Permittee. Any permittee whose work must be completed by City forces, will not be able to apply for any additional permits, or have their yearly status renewed until full payment for required services has been received by the City.

All work shall be done in accordance with the Department of Public Works – Engineering Division's "Manual for Occupancy of Public Ways within the City of Springfield" and the Massachusetts Highway Department and / or Massachusetts Department of Transportation Standard Specifications. Additional requirements may be specified at the discretion of the

Director of Public Works or his designee. Standard repair details are attached to this document in Appendix D.

1-G-7 WINTER PERMIT RESTRICTIONS

Any construction involving excavation of roadway surfaces shall not be permitted during the period of December 1 of one year to April 1 of the next year. Any exceptions to the above may be granted only by the Director of Public Works, or his designee. Any emergency excavation that is required must include immediate notification of the City of Springfield DPW - Engineering Division and will require the submission of Application for Excavation Permit. The contractor is responsible for the maintenance of any and all excavations until final approved pavement patching is completed. Temporary winter patching (cold patch, etc.) must be maintained by the contractor throughout the winter season. The Contractor must immediately address any pavement issues that occur due to rain, sanding or salting operations, snow, snow plowing, etc. that may result in water ponding, potholes, or etc or any other unsafe roadway condition. When the City determines that a particular excavation requires attention, per-day rates will be charged to the contractor until the situation is addressed. The Contractor is required to notify the DPW – Engineering division when final paving will occur in the spring.

1-G-8 PENALTIES / FINES

Any person, company, and / or utility, found to be occupying any City Right-of-way without an appropriate permit, will be required to stop work immediately, secure the project site, and obtain a permit from the Department of Public Works – Engineering Division. When applying for the appropriate permit, a penalty fee / fine of \$750 will be charged and the start date of occupancy / excavation will be retroactive to the date found to be occupying the right-of way illegally. It may take as long as 72 hours to issue a permit, during which time the violator will be responsible for securing work location and will be held liable for any and all accident occurring due to work within right-of-way. Any person / company and / or utility who has obtained a yearly contractor approval, and is found to be working within the City's right-of-way without appropriate permits, will have their yearly approval contractor status revoked, and will be required to reapply for contractor approval and will be required to pay appropriate application fees. During this period the person / company and / or utility will be required to secure all work and will be liable for all incidents occurring due to the work. If it is determined by the City that a dangerous condition exists, the City may repair the area, and charge services back to said person / company and / or utility.

Continuous violations of said regulations by the same person, firm or corporation shall result in the denial of any further Street Occupancy Licenses. Mobile Food Truck vendors who operate without a proper Occupancy Permit issued by the DPW, or who operate in a non-approved location will be subject to a \$750 fine along with a \$100 per day fine as long as the vendor continues to operate illegally. Vendors who continue to operate illegally will also have the Certification issued by the City's Health and Human Services Department, Police Department and Fire Department revoked.

Mobile Food Truck Vendors who do not comply with the regulations listed in section 1-F of the manual will be subject to a \$100 per day or per instance fine, and subject to the discretion of the Police Department and the Director, and will have the issued occupancy permit revoked and the vendor will not be eligible for any new permits until the next quarterly time period for permits begins.

Mobile Food Truck Vendors who continuously fail to comply with the rules and regulations of this manual will no longer be issued any occupancy permits.



SECTION 2

CITY SPECIFICATIONS FOR THE REPAIR OF VARIOUS PARTS OF THE PUBLIC WAY

2-A GENERAL

The Permittee will be required to furnish all materials and will be responsible for excavation and repair work to be done in a workman-like manner. Before any work will be acceptable to the City, all improvements must be placed in a condition as good or better than before the work was started, as determined by the Director of Public Works or his designee. Contractors will be required to adhere to the surface restoration details for specific excavations as shown in Appendix D

2-B SPECIFICATIONS FOR PATCHING BITUMINOUS CONCRETE ROADWAYS

<u>Backfill</u>: The material shall be a good quality as determined by the inspector. The base shall consist of good clean bank gravel equal in depth to the gravel excavated, but not less than 18 inches. All material shall be laid in eight (8) to ten (10) inch layers and thoroughly compacted by mechanical compactors. "The material shall be compacted to a minimum density of ninety-five percent (95%) for the full depth of the trench."

<u>Temporary Patch</u>: Conditions may warrant the necessity of a temporary patch due to extenuating circumstances. If the Director or his designee so orders the excavation shall be backfilled in accordance with the preceding paragraphs and the top surface shall be covered with two (2) inches of bituminous concrete Type-I. The Licensee shall be required to maintain this temporary patch until a permanent patch is placed. The patch shall be such that all vehicular and pedestrian traffic are able to pass over safely at a legal rate of speed.

<u>Permanent Patch</u>: All pavement joints shall be saw cut straight and vertical, as shown on the Surface Restoration Details in Appendix D, cleared of all foreign material, dry, tacked with emulsion and sealed after completion of the pavement patch with emulsion.

Replacement of Bituminous Concrete Roadways: The following minimum specifications shall be met:

Residential Streets: Twelve (12) inches of gravel and three (3) inches of bituminous concrete to be installed in two (2) equal lifts.

<u>Main Arterials</u>: Twelve (12) inches of gravel, two (2) inches of bituminous dense base, and three (3) inches of bituminous concrete surface course to be used. The three (3) inch bituminous layer shall be installed in two (2) equal lifts.

All work to be done in accordance with the "Standard Specifications for Highways and Bridges of the Massachusetts Highway Department or Massachusetts Department of Transportation", current edition.

The contractor shall be required to correct trench settlement and faulty pavement patches, for a period of two (2) years after permanent patch is placed, at the direction of the Department of Public Works, regardless if a pavement life-cycle fee has been paid.

2-C INLAYED OR IMPRINTED CROSSWALKS

Throughout the City of Springfield, most specifically in the downtown area, many roadways have been improved and contain either inlayed or imprinted pedestrian crosswalks. If any excavation occurs that disturbs or removes any of the existing inlayed or imprinted crosswalks, the contractor will be required to replace the inlay or imprint, as directed by the DPW Director or his designee. The exact limits of replacement will be determined at the time of application and the contractor will be required to match patterns, pavement types, colors, etc. Contractor may be required to submit samples and / or installation procedures prior to the actual construction.

2-D GRASSED AREAS

All unpaved areas disturbed as part of any excavation, shall be graded, loamed with at least four (4) inches of loam, after compacting, and seeded with a suitable cover of seed as specified in the "Standard Specifications for Highways and Bridges of the Massachusetts Highway Department or Massachusetts Department of Transportation", current edition.

Whenever a slope condition exceeds 30% in an area where seeding is necessary, a covering of tobacco netting or similar soil stabilization technique shall be utilized to prevent soil erosion.

The licensee shall be required to maintain grassed areas until a substantial cover has been achieved. A substantial cover is obtained when all areas are completely covered and a vigorous growth of four (4) inches has been obtained and at least one mowing has occurred.

2-E SIDEWALK CONSTRUCTION

Sidewalks shall be pitched at the rate of three-sixteenth (3/16) inch to the foot, from the right-of-way line to the top of the curb.

Partial patching of concrete walks shall not be allowed. If any part of a concrete walk is broken or damaged in any way, the entire slab to the nearest expansion joint (actual or visual) shall be removed and replaced with concrete. A slab is defined as that portion of a concrete walk outlined by a scoring pattern. If an expansion joint is not present then the concrete shall be cut by use of a concrete saw along the nearest scoring line. Jack hammers or other impact cutting tools shall not be allowed for this purpose. The saw cut shall be made prior to any attempt to break up or remove the slab.

Wherever sidewalks or curbs are being constructed or reconstructed, handicapped access and curb cuts must be provided. Further, whenever one corner of an intersection is being constructed or reconstructed, handicapped access shall be provided on ALL other corners at the same time.

Proper reinforcement of sidewalk will be required as shown on the Surface Restoration Details in Appendix D.

See Section 4-C of the manual for further specifications on this item.

2-F RESIDENTIAL DRIVEWAYS

- 1. Driveway to be located a minimum of 25 feet from any corner radius of intersecting street.
- 2. Driveway to have a minimum width of 10 feet and a maximum width of 20 feet between curb return corners.
- 3. Standard 2-foot granite curb returns shall be utilized unless otherwise approved in writing by the Director of Public Works or his/her designee.
- 4. Entire driveway, including 2-foot curb returns, must be within the property lines extended from the property, which the driveway serves except as approved in writing by the Director of Public Works or his/her designee.
- 5. Driveway apron must meet sidewalk grade.
- 6. Portion of driveway within the public way must be constructed according to City specifications.
- 7. If any trees, poles, signs or utilities are located within the limits of the proposed driveway, the appropriate City Department and/or Utility Company shall be notified for the removal or relocation of such at the applicant's expense.
- Conditions may tend to alter proposed width and location of driveway. Any variations from the Standards shown must be approved by the Director of Public Works or his designee.
- 9. Patching of bituminous concrete and/or cement concrete driveways (sidewalks) shall be done in accordance Standard Specification for Highways and Bridges of the Massachusetts Highway Department / Massachusetts Department of Transportation. Where a new driveway meets the existing roadway, roadway pavement must be "saw-cut" to match new pavement.
- 10. The rate of change of grade from the property line to the pavement line shall not be over one (1) foot per ten (10) feet of distance. There should be a minimum of eleven (11) inches pitch from gutter line to street line except as approved in writing by the Director of Public Works or his designee.
- 11. In those instances where a driveway crosses over a concrete sidewalk, refer to Section 2-D of this manual (Standard Sidewalk Construction at Driveways).

2-G DAMAGE TO PRIVATE PROPERTY

If at times during the course of any occupancy / excavation work, private property becomes damaged, it will be the responsibility of the contractor to repair the area to the satisfaction of the impacted property owner and / or the City of Springfield.

2-H SIGNAGE AND BARRICADES

Any signage, barricades, directional or safety devices required to properly identify the work zone or alternate routes, etc., must comply with all standards and requirements of the Massachusetts Highway Department / Massachusetts Department of Transportation and with the Manual of Uniformed Traffic Control Devices (MUTCD).

If directed by the Director of Public Works or his designee, the contractor may be required to submit a traffic control plan or detour plan that would specifically locate all signs, barricades, etc.

2-I PAVEMENT MARKINGS

The contractor is required to re-apply any and all pavement markings that are removed and/ or damaged as part of any excavation, regardless of the size / length of the removal. Pavement marking replacement type must match existing type, style, width, color, etc., including pavement legends.



SECTION 3

<u>AUTHORITY</u>

3-A. GENERAL LAWS OF THE COMMONWEALTH OF MASSACHUSETTS

THE COMMONWEALTH OF MASSACHUSETTS

Advance Copy

1980

Acts and Resolves

MICHAEL JOSEPH CONNOLLY, State Secretary

CHAP. 502. AN ACT FURTHER REGULATING EXCAVATIONS IN PUBLIC WAYS.

Be it enacted, etc., as follows:

SECTION 1. Chapter 82 of the General Laws is hereby amended by striking out section 40, as amended by section 1 of chapter 403 of the acts of 1968, and inserting in place thereof the following section:-

No person shall, except in an emergency, contract for, or make SECTION 40. an excavation, which shall include, but not be limited to, the discharge of explosives and the demolition of any structure by which shall not be deemed to include gardening or tilling the soil in the case of privately owned land, in any public way, any public utility company right of way or easement, or any privately owned land under which any public utility company, municipal utility department, or natural gas pipeline company maintains underground facilities, including pipes, mains, wires or conduits, unless at least seventy-two hours, exclusive of Saturdays, Sundays and legal holidays, but not more than sixty days, before the proposed excavation is to be made such person has given an initial notice in writing of the proposed excavation to such natural gas pipeline companies, public utility companies, and municipal utility departments as supply gas, electricity, or telephone service in or to the city or town where such excavation is to be made. Such notice shall set forth the name of the street or the route number of said way and a reasonably accurate description of the location in said way or on private property the excavation is to be made. If such notice cannot be given as aforesaid because of an emergency, it shall be given as soon as may be practicable. Copies of such notices together with a statement certifying that they have been mailed or delivered to such public utility companies as required by the preceding provisions of this section shall be filed with the officer or board having charge of any such public way before a permit to excavate may be approved or issued, except in case of an emergency.

Where an excavation is to be made by a contractor as part of the work required by a contract with the commonwealth or with any political subdivision thereof or other public agency, for the construction, reconstruction, relocation or improvement of a public way or for the installation of a railway track, conduit, sewer or water main, such contractor shall be deemed to have complied with the requirements of this section by giving one such notice setting forth the location and the approximate time required to perform the work involved to each of said companies.

ACTS 1980 - CHAP. 502

Within seventy-two hours, exclusive of Saturdays, Sundays and legal holidays, from the time said notice is received or at such time as said company and the excavator agree in writing, said company shall respond to the original written notice or to subsequent oral or written notice by designating at the locus, the location of pipes, mains, wires or conduits, in that portion of the public way, public utility company right-of-way or easement or privately owned land in which the excavation is to be made, and the providing of such designation by the company shall constitute prima facie evidence of an exercise of reasonable precaution by the company as required by this section.

Any such excavation shall be performed in such manner, and such reasonable precautions taken to avoid damage to the pipes, mains, wires or conduits in use under the surface of said public way, public utility company right-of-way or easement, or privately owned land, including, but not limited to, any substantial wire, or conduit, penetration or destruction of any pipe, main, wire or conduit or the protective coating thereof, or the severance of any pipe, main or conduit.

When any damage to any pipe, main wire or conduit or its protective coating occurs, the public utility company, natural gas pipeline company, or municipal utility department shall be notified immediately by the person or public agency responsible for the excavation causing the damage.

The making of an excavation without providing notice or notices required by this section with respect to any proposed excavation which results in any damage to a pipe, main, wire or conduit or its protective coating shall be prima facie evidence in any legal or administrative proceeding that such damage was caused by the negligence of such person.

Notice to the public utility underground plant damage prevention system pursuant to section seventy-six D of Chapter one hundred and sixty-four, which notice provides the information required by this section with respect to any proposed excavation and which is given at least seventy-two hours, exclusive of Saturdays, Sundays and legal holidays, but not more than sixty days, before the proposed excavation is to be made, shall constitute compliance with the notice requirement of this section.

Nothing contained in this section shall be construed to affect or impair local ordinances or by-laws requiring permits to be obtained before excavating in a public way, except that, notwithstanding any contrary provision of local ordinances or bylaws, no permit to excavate in a public way shall be approved or issued by the officer or board having charge of any such way, except in an emergency, until such time as copies of such notices to public utility companies are filed by the applicant for a permit as required by this section.

ACTS 1980 - Chap. 502

Whoever violates any provision of this section shall be punished by a fine of two hundred dollars for the first offense and not less than five hundred dollars nor more than one thousand dollars for any subsequent offense.

Section forty-one and forty-two of said Chapter eighty-two are SECTION 2. hereby repealed.

Chapter 164 of the General Laws is hereby amended by SECTION 3. inserting after Section 76C, inserted by Chapter 645 of the acts of 1968, the following section:-

All natural gas pipeline companies and public utility companies, SECTION 76D. as defined in section three of chapter twenty-five, shall create, participate in and be responsible for the administration of a utility underground plant damage prevention system. Said system shall be operated during normal business hours each day of the year, exclusive of Saturdays, Sundays and legal holidays, for the purpose of receiving notices of proposed excavations in public ways, utility rights-of-ways, and in privately owned land under which any public utility company, municipal utility department or natural gas pipeline company maintains underground facilities, including pipes, mains, wires or conduits, as are required by the provisions of section forty of chapter eight-two. Said system shall be responsible, upon receipt of such notices, for immediately notifying such natural gas pipeline companies, public utility companies, and municipal utility departments as supply gas, electricity or telephone service in or to such city or town where such excavation is to take place of such proposed excavation. The cost of operating the utility underground plant damage prevention system shall be apportioned equitably among all natural gas pipeline companies, public utility companies and municipal utility departments as supply gas, electricity or telephone service within the commonwealth according to a formula to be fixed by agreement of the companies.

The department is authorized to investigate the operation of said system and to adopt procedures necessary and appropriate to hear and resolve complaints for failure and appropriate to hear and resolve complaints for failure to comply with the provisions of section forty of chapter eighty-two.

Approved July 14, 1980

REVISED ORDINANCES OF THE CITY OF SPRINGFIELD 3-B.

DIGGING UP STREETS AND SIDEWALKS: PLACING MATERIAL Sec. 22-45 THEREON.

No person, except the superintendent of streets and engineering, in the performance of his duties, shall break or dig up or cause to be broken or dug up the pavement or ground in any public street, or any sidewalk or common in the city, or erect or cause to be erected any staging for building thereon, or place or cause to be placed any materials or rubbish thereon, without first obtaining from the superintendent of streets and engineering a written license stating the space in the street or other public place that may be occupied, and the time allowed for such occupancy, and such other provisions as they may deem best, and filing with the superintendent of streets and engineering a written agreement under seal, approved by the superintendent of streets and engineering, to comply strictly with the terms of the license and indemnify the city from all loss, cost or expense that it may suffer by reason of such occupancy.

(R. O. 1956, ch. 26, & 49.)

3-C. ARCHITECTURAL ACCESS BOARD

A. <u>APPLICABLE TO ALL FACILITIES</u>: the following Regulations shall apply to all facilities:

SITE CONDITIONS

<u>Curb cuts:</u> Curb cuts are required wherever sidewalks or curbs are being construct-ed or reconstructed, and they shall comply with the following:

<u>Location</u>: Curb cuts shall be located, one (1) at each corner of each intersection, adjacent to the radius of the corner and at all street crossings; and in no case at a distance greater than fifteen (15) feet from the intersection of the curb lines. When curbs or sidewalks are constructed or reconstructed on only one side of the street, curb cuts shall be installed on the opposite side(s) of the street.

<u>Slope</u>: Slope of curb cuts shall not exceed one in twelve (1 in 12), and slope shall blend to a common level with the street. Where sidewalks are too narrow to install a straight-line curb cut at a slope of one in twelve (1 in 12), the flared or fanned sides of the curb cut shall also slope at one in twelve (1 in 12).

Width: Width of curb cuts shall be not less than forty (40) inches, not including sloped sides.

<u>Sides</u>: The sides of curb cuts shall be sloped no less than eighteen (18) inches in width at the curb.

Curb Height: Curb height at intersections shall not exceed six (6) inches.

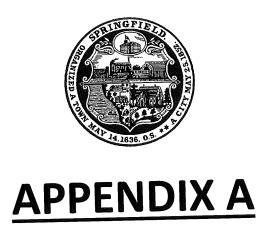
Texture: Detectable warning panels are required for all wheelchair ramps.

3-D INSTALLATION OF WHEELCHAIR RAMPS

As part of some excavations, existing wheelchair ramps may be impacted. If any portion of any existing ramp is impacted, the Contractor will be required to replace the ramp in its entirety and comply with all current rules and regulation. The contractor will be responsible for obtaining all of the current detail and specifications required to replace the ramp. Some of the current rules and regulations in place include:

- 1. THE SIDEWALK CROSS-SLOPE MUST NOT EXCEED 1/4" PER FOOT FOR BRICK AND CEMENT CONCRETE AND 3/16" PER FOOT FOR BITUMINOUS CONCRETE. (REFER TO **STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES**, SECTION 700.) IN NO INSTANCE SHALL THE SIDEWALK CROSS SLOPE EXCEED 3% EXCEPT THE RAMP AREA PROPER WHICH IS EXEMPT.
- 2. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 36" SHALL BE MAINTAINED.
- 3. THE WHEELCHAIR RAMP SLOPE AND SIDE SLOPES (TRANSITIONS), MUST NOT EXCEED 1:12, HOWEVER THESE SLOPES MAY BE FLATTER THAN 1:12 WHEN WARRANTED BY SURROUNDING CONDITIONS.
- 4. WHERE THE ROAD PROFILE EXCEEDS 5% THE HIGH SIDE TRANSITION LENGTH (Lfh) WILL BE A MAXIMUM OF 15'.
- 5. IN NO CASE, WHERE A STOP LINE IS WARRANTED, SHALL A RAMP BE PLACED BEHIND THE STOP LINE.
- FIXED OBJECTS UTILITY POLES, HYDRANTS, ETC. MUST NOT EN-CROACH ON WHEELCHAIR RAMPS.
- 7. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
- 8. CATCH BASINS WHICH ARE TO BE LOCATED IN THE VICINITY OF A WHEELCHAIR RAMP SHOULD BE LOCATED UP-GRADE WHENEVER POSSIBLE.
- 9 THE ENTRANCE OF THE WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.
- 10. TESTING SURFACE: WHEN TESTING WITH A STRAIGHTEDGE PLACED PARALLEL TO THE LINE OF SLOPE, THERE SHALL BE NO DEVIATION FROM A TRUE SURFACE IN EXCESS OF 1/4 OF AN INCH.
- 11. A MID-BLOCK TYPE WHEELCHAIR RAMP WILL NOT BE CONSTRUCTED ON BRIDGES DUE TO THE REQUIRED 12" CURB REVEAL, BUT ACCESSIBILITY WILL BE PROVIDED ALONG THE BRIDGE SIDEWALK.
- 12. WHEN IT IS TECHNOLOGICALLY UNFEASIBLE TO CONSTRUCT WHEEL-CHAIR RAMPS IN COMPLIANCE WITH THE ARCHITECTURAL ACCESS BOARD'S REGULATIONS, A VARIANCE WILL NEED TO BE SUBMITTED. THE DEPARTMENT'S HANDICAPPED ACCESSIBILITY SECTION SHOULD BE CONTACTED UNDER THESE CIRCUMSTANCES.
- 13. ANY WHEELCHAIR RAMP THAT IS DISTURBED AND IS NOT CURRENTLY CONSTRUCTED TO THE CURRENT ADA / AAB STANDARD SHALL HAVE THE

RAMP AND ANY AND ALL RAMPS AT THAT INTERSECTION MUST BE BROUGHT UP TO CURRENT STANDARD.



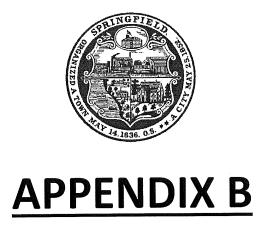
STREET OCCUPANCY PERMIT APPLICATION FORM

CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION STREET OCCUPANCY PERMIT APPLICATION FORM



Required Info	rmation:
---------------	----------

	Date of Application	on:					
1. 2.	Type of Permit (C Name of Respons Applying for Perm	ible Person	Daily	Yearly			
3.	Applicant / Comp Organization (If a						
4.	Applicant Address	s:					
5.	Phone Number:	Office / Home:					
		Cell:	Mark the second				
6.	Start Date:	THE PROPERTY OF THE PROPERTY O					
7.	End Date:						
8A.	Street Permit Loc Map, if required o	•	AND AND THE PROPERTY OF THE PR				
8B.	List Two adjacent (Example Main St Bridge St and Wo	treet between					
9A.	Reason for Issuing Work Permit (New Installation, Crane, Dumpster, Delivery, etc.)						
9B.	Reason for Issuing Block Party, Walk	g Event Permit (F					
10.	Describe Work Ev	rent:					
11.	Fee Calculation:	Application Daily Fee (_ Annual Fee	Fee: days X \$25/day)	\$75 \$ \$			
		E	Estimated Total:	\$			
Auti	norized Signature:	INVALID	WITHOUT APPLICANT SIGN	IATURE			
Occi	_	/ays within the C	PW permit regulations and City of Springfield" – Latest	fees as outlined in the "Manual for Edition			



YEARLY LICENSED CONTRACTOR APPLICATION FORM

For Office Use Only

YEARLY LICENSED CONTRACTOR SUBMISSION CHECKLIST

Submitted and Approved	<u>Task</u>
	Original Completed Annual License Application Form
	Pay a \$125 application fee (no cash) – copy of check for file
	Produce a \$10,000 Permit Bond (must be original – no fax copies accepted)
	Provide a Certificate of Liability Insurance that meets all requirements of sample form. Certificate can be faxed or e-mailed
	Supply three (3) recent, local references from other municipalities on municipal letterhead or approved alternate references. Reference Letters can be hand delivered or mailed to:
	City of Springfield Engineering Division Permit Coordinator 70 Tapley Street Springfield ,MA 01104
	Supply copies of the operators MA Hoisting Equipment License as well as an original signature of each excavator for our file as per OSHA Regulations, G.L. c. 82A, 520 CMR 7.00 et seq.
	Supply OSHA Competent Worker Training Certificate
Comments:	

NOTE:

Contractors will not be allowed to begin any work until all above material has been submitted and accepted, and an approval letter has been received.

Last Modified: 04/11/2024 at 12:57PM

CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION



YEARLY LICENSED CONTRACTOR APPLICATION FORM

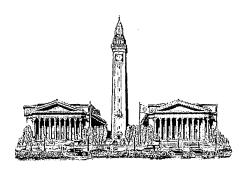
Requ	ired Information:	
1.	Date of Application.	
2.	Name of Contractor	•
3.	Contractor Address.	
4.	Phone Number:	Office / Home:
		Cell:
		Fax:
5.	Primary Contact Name, Phone # and mail address	l e-
6.	Please describe you trench safety:	r company's experience in street excavation, pavement restoration and
7.	Recommendation S A.	Summary (List 3 References):
	В.	
	C.	
		OFFICIAL USE ONLY
The 1.	-	ic Works / City Engineer: Date: to the issuance of a license:
2.		uance of a license:
3.	Has not been pro	vided with enough information:
Oth	er Comments:	

DEPARTMENT OF PUBLIC WORKS

ENGINEERING DIVISION

70 TAPLEY STREET SPRINGFIELD, MA 01104

413-787-6210 413-787-6029 FAX





CITY OF SPRINGFIELD MASSACHUSETTS

Date:

Contractor Name Address

Dear Sirs:

Your application to be a licensed contractor under the City of Springfield's Occupancy Permit Program has been approved. Your approval is active for the calendar year ______.

You can re-apply for your approval for the next calendar year beginning October 1 of this year. We recommend that you apply early to ensure no lapse in approval status.

Thank You very much for working in the City of Springfield.

Very Truly Yours,

Matthew J. Sokop, P.E.

City Engineer

This letter will be issued by the DPW – Engineering Division upon obtaining approval status.

CONTRACTOR LETTERHEAD Address, Telephone #, etc.

Date:

Mr. Matthew J. Sokop, P.E City Engineer Springfield Department of Public Works – Engineering Division 70 Tapley Street Springfield, MA 01104

Dear Mr. Sokop:

Re: OSHA Excavation Competent Person Training

I certify that the following employees are OSHA Excavation Competent Persons and that they are responsible for overseeing the trench excavation safety requirements of the Commonwealth of Massachusetts (520 CMR 14.00, et. Al.) and the applicable Federal OSHA general industry and construction health & safety regulations:

Name 1

Name 2

Name 3

Etc.

Supporting OSHA training certificate(s) are attached.

Please contact me at XXX-XXXX or via e-mail at xxxx@xxxxxxxx if you have any questions.

Sincerely,

Contractor Authorized Signature

This sample letter should be sent by the contractor to the City of Springfield identifying OSHA approved personnel

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				CUSTO					NAIO #
JRED [7		SURER(S) AFFOR	IDING COVERAGE		NAIC #
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				INSUR		"Workers	Comp Bureau" not	t [
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	LIABILITY		- 1				EACH OCCURRENCE DAMAGE TO RENTED	\$	1,000,000
	MERC:AL GENERAL LIABILITY		Br	14/ 53453000	12/24/40	1 40/04/44	MISES (Fa occurrence)	\$	100,000
	CLAIMS-MADE X OCCUR						MED EXP (Any one person)	\$	5,000 1,000,000
<u> </u>				N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			PERSONAL & ADV INJURY	\$	2,000,000
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X HIRE	ED AUTOS			with either	imits		(Peraccident)	<u> </u>	\$3
X NON	-OWNED AUTOS							\$	
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(Mandator	PRIFTOR/PARTNER/EXECUTIVE MEMBER EXCLUDED?	N/A		All sections must	Con	tractor must	DISEASE - EA EMPLOYEE	\$	1,000,00
If yes, des	cribe under TION OF OPERATIONS below			have a policy		mit updated		\$	1,000,00
LCCOCK	Jmbrella		BE	number, not "Policy	/ II poli	icy following	ess Um		5,000,00

CERTIFICATE HOLDER

Required for all certificates

City of Springfield
Department of Public Works
70 Tapley Street
Springfield, MA 01104

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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ACORD 25 (2009/09)



The Hanover Insurance Company | 440 Lincoln Street, Worcester, MA 01653 Cilizens Insurance Company of America | 645 West Grand River Avenue, Howell, Mt 48843 Massachusetts Bay Insurance Company | 440 Lincoln Street, Woicester, MA 01653

STREET PERMIT BOND

		Bond NoE
KNOW ALL MEN BY THESE PRESENTS, that we	., <i>I</i>	
	of	
as Principal, and \square The Hanover Insurance Company Company (A New Hampshire Corporation), as Surety,	(A New Hampshire Co are held and firmly bo	rporation) Massachusetts Bay Insurance und unto
City of Springfield DWP		, as Obligee, in the penal sum of
Ten Thousand Dollars United States, for the payment of which sum well and		, good and lawful money of the
administrators jointly an	E PERMIT BO	
WHEREAS the sale rime parties applied to san	a opingee for a neemse	
open, occupy, cross by vehicles and obstruct a certain	portion of a public sid	ewalk/berm, curbing, street or way in said
Town or City of Springfield		,
NOW, THEREFORE, THE CONDITION OF THIS and honestly comply with the provisions of all Laws o is issued, then this obligation shall be vold; otherwise PROVIDED, THE LIABILITY OF THE SURETY up full period of the license, and renewals thereof, issued the Obligee of a written notice signed by such Surety, is thereby terminated and canceled; and provided furt shall have accrued under this bond prior to the date o	or Ordinances of Oblige to be and remain in fu on this bond shall be a to the principal above or its authorized agen ther, that nothing here	ee regulating the business for which license il force and virtue. Ind remain in full force and effect for the named, or until ten days after receipt by t. stating that the liability of such Surety
Signed, sealed and dated the	day of	April 2009
	A	Principal
i i	By	(Seal)
1972 E	☐ THE HANOVER INS☐ MASSACHUSETTS By:	SURANCE COMPANY BAY INSURANCE COMPANY

THE HANOVER INSURANCE COMPANY MASSACHUSETTS BAY INSURANCE COMPANY CITIZENS INSURANCE COMPANY OF AMERICA

POWERS OF ATTORNEY CERTIFIED COPY

KNOW ALL MEN BY THESE PRESENTS: That THE HANOVER INSURANCE COMPANY and MASSACHUSETTS BAY INSURANCE COMPANY, both being corporations organized and existing under the laws of the State of New Hampshire, and CITIZENS INSURANCE COMPANY OF AMERICA, a corporation organized and existing under the laws of the State of Michigan, do hereby constitute and appoint

Jillian A. Gustavis

of Chicopee, MA

and each is a true and lawful Attorney(s)-in-fact to sign, execute, seal, acknowledge and deliver for, and on its behalf, and as its act and deed any place within the United States, or, if the following line be filled in, only within the area therein designated

any and all bonds, recognizances, undertakings, contracts of indemnity or other writings obtigatory in the nature thereof, as follows: Street Permit

in the amount of \$10,000.00 and said companies hereby ra These appointments are made resolutions are still in effect;

SAMPLE PERMIT BOND

rlue of these presents. npanies which

"RESOLVED, That the President or any Vice President, in conjunction with any Assistant Vice President, be and they are hereby authorized and empowered to appoint Attorneys-in-fact of the Company, in its name and as its acts, to execute and acknowledge for and on its behalf as Surety any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings Altorneys-in-fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company In their own proper persons." (Adopted October 7, 1981. The Hanover Insurance Company; Adopted April 14, 1982 - Massachusetts Bay Insurance Company; Adopted September 7, 2001 - Citizens Insurance Company of America)



THE HANOVER INSURANCE COMPANY MASSACHUSETTS BAY INSURANCE COMPANY CITIZENS INSURANCE COMPANY OF AMERICA

excluse Mary Jeanne Anderson, Vice President

IN WITNESS WHEREOF, THE HANOVER INSURANCE COMPANY, MASSACHUSETTS BAY INSURANCE COMPANY and CITIZENS INSURANCE COMPANY OF AMERICA have caused these presents to be sealed with their respective corporate seals, duly attested by a Vice President and an Assistant Vice President, this 28th day of April 2009

THE COMMONWEALTH OF MASSACHUSETTS COUNTY OF WORCESTER

On this 28th day of April 2009, before me came the above named Vice President and Assistant Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, to me personally known to be the individuals and officers described herein, and acknowledged that the seals affixed to the preceding instrument are the corporate seals of The Hanover Insurance Company Massachusetts Bay Insurance Company and Citizens Insurance Company of America, respectively, and that the said corporate seals and their signatures as officers were duly affixed and subscribed to said instrument by the authority and direction of said Corporations.



) ss.

My commission expires on November 3, 2011

I, the undersigned Assistant Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, hereby certify that the above and foregoing is a full, true and correct copy of the Original Power of Attorney issued by sald Companies, and do hereby further certify that the said Powers of Attorney are still in force and effect.

This Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of The Hanover Insurance Company, Massachusetts Bay, Insurance Company and Citizens Insurance Company of America,

"RESOLVED, That any and all Powers of Attorney and Certified Copies of such Powers of Attorney and certification in respect thereto, granted and executed by the President or any Vice President in conjunction with any Assistant Vice President of the Company, shall be binding on the Company to the same extent as if all signatures therein were manually affixed, even though one or more of any such signatures thereon may be facsimile." (Adopted October 7, 1981 - The Hanover Insurance Company; Adopted April 14, 1982 - Massachusetts Bay Insurance Company; Adopted September 7, 2001 - Cilizens Insurance Company of America)

GIVEN under my hand and the seals of said Companies, at Worcesler, Massachusetts, this

day of

April 2009

THE HANOVER INSURANCE COMPANY MASSACHUSETTS BAY INSURANCE COMPANY CITIZENS INSURANCE COMPANY OF AMERICA

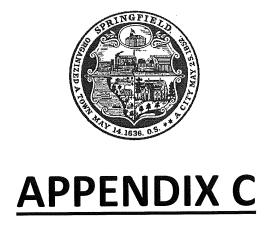


The Hanover Insurance Company | 440 Lincoln Street, Worcoster, MA 01653 Cilizens Insurance Company of America | 645 West Grand River Avenue, Howell, MI 48843 Massachusetts Bay Insurance Company | 440 Lincoln Street, Worcester, MA 01653

ONLINE MISCELLANEOUS SURETY BOND APPLICATION

PRIOR TO RELEASING BOND, THE APPLICATION MUST BE SIGNED BY THE PRINCIPAL/APPLICANT AND, IF REQURED, BY ANY ADDITIONAL INDEMNITOR(S) WITH EACH SIGNATURE WITNESSED

BASIC MISCELLANOUS SURE	TY APPLICATION INFORMATION
Surety Company:	Bond Number: E
Name of Principal or Applicant: A	
Name of Obligee:	
Type of Bond:	Bond Amount: \$10,000.00
Effective Date: April 28, 2009	
AGREEMENT	F OF INDEMNITY
truth of all statements in the application and attachments and jointly and 1) to pay the usual premiums, including continuations and/or rene 2) to completely INDEMNIFY the Company from and against a Company shall at any time sustain as surety on this bond or any 3) that the Company shall, without notice, have the right to amend this agreement shall apply to any such amended bond; 4) that the Company shall have the right to adjust, settle or co decision in good faith to make any payment shall be final and c 5) upon demand by the Company, to deposit current funds with th reason of such suretyship; 6) that if said bond is cancelable, this agreement may be terming written confirmation from the Company stating when such term	wals; any liability, loss, costs, attorney's fees, and expenses whatsoever which the y other bond, or for the enforcement of this agreement; I the penalty terms and conditions of any bond issued for the undersigned and impromise any claim, demand, suit or judgment upon said bond(s) and its conclusive as to the fact and extent of the liability of the undersigned; the Company in amount sufficient to satisfy any claim against the Company by the day to subsequent liability, upon written notice to the Company and with
NOTE: Full Collateral may be required for certain types of bonds. APPLICABLE IN NEW YORK S Any person who knowingly and with intent to misleading, information concerning any fact i	E PERMIT BOND conceals for the purpose of
Please sign below in the appropriate se	ction and have your signature(s) witnessed.
	Signed and Dated: April 28, 2009
(Name	of Applicant)
Witness:	**
Witness:	By:(Individual)
Witness:	By:(Partner)
Witness:	Ву:
17411055.	(Partner)
Witness:	By:(Managing Member)
Witness:	By:
Witness:(Corporate Secretary)	(President)
In consideration of the execution by the Company of the bond herein applied indemnity agreement. SIGNATURE 6	plied for, the undersigned, jointly and severally, join in the foregoing OF INDEMINITORS
Witness:	(Indemnitor)
Witness:	
	(Indemnitor)
Witness:	(Indemnitor)(Indemnitor)



STREET EXCAVATION PERMIT APPLICATION FORM

CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION STREET EXCAVATION PERMIT APPLICATION FORM

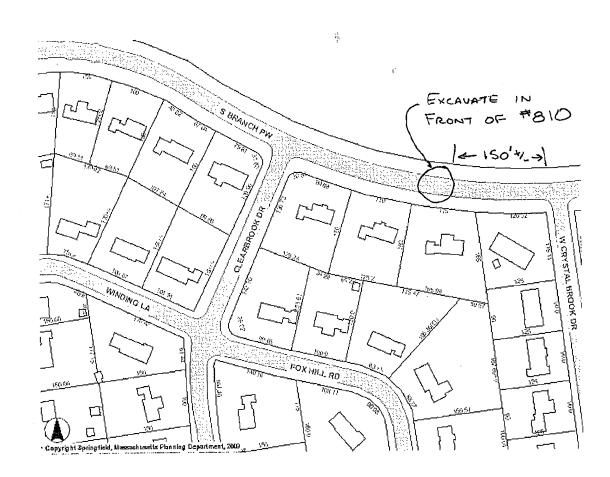


Required Information:

	Date of Application	on:	
1.	Location of Excav	ation (Circle Public Way	Private Way / Property
2.	Name of Respons Applying for Pern		
3.	Applicant / Comp (must be a license	•	
4.	Applicant Address	5:	
5.	Phone Number:	Office:	
		Cell:	
6.	Start Date:		
7.	End Date:		
8.	DigSafe Number (without DigSafe N	·	
9.	Street Permit Loca Map, if required o	ation, Attach	
10.	List Two adjacent (Example Main St Bridge St and Wo	reet between	
11.	Describe Work Ev	ent:	
11.	Fee Calculation:	Application Fee:	\$75
		Daily Fee (days X \$45 / da	y) \$
		Life Cycle pavement Fee	\$
		Estimated Total:	\$
	orized Signature:	INVALID WITHOUT APPLICANT SIG	GNATURE

STREET EXCAVATION PERMIT SKETCH

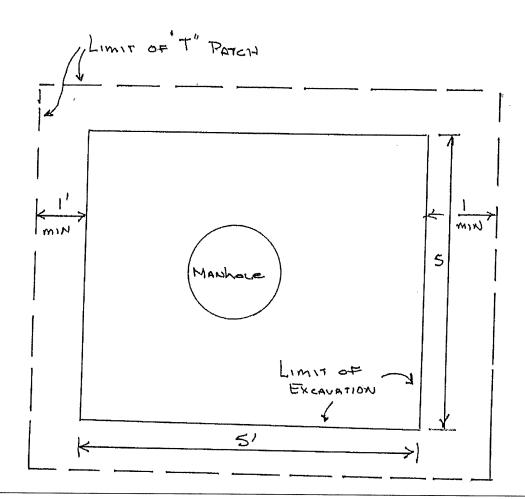




SAMPLE SKETCH

STREET EXCAVATION PERMIT SKETCH



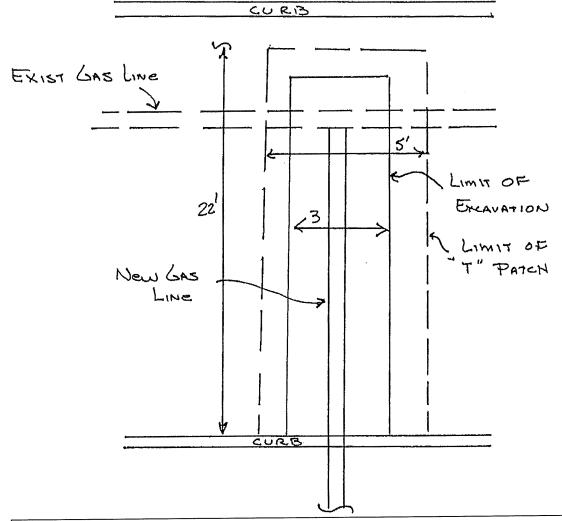


Manhole Repair
Life Cycle Calculation
Pavement 4 years old = \$65 / sf
Cost = 7' x 7' x \$65 / sf = \$3,185

SAMPLE SKETCH

STREET EXCAVATION PERMIT SKETCH





Trench Excavation

Life Cycle Calculation

Pavement 7 years old = \$30 / sf

Cost = 5' x 22' x \$30 / sf = \$3,300

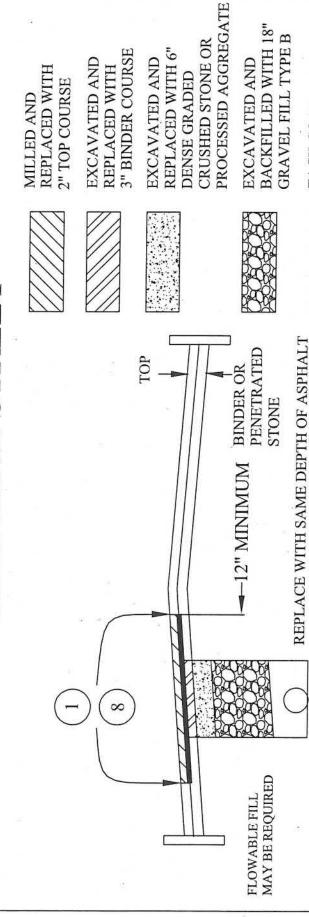
SAMPLE SKETCH



RESTORATION DETAILS

- Arterial Street Trench and Pavement Repair
- Residential Street Trench and Pavement Repair
- Sidewalk / Driveway Repair
- Multiple Excavation Repair
- Inlay or Imprinted Pavement Repair

TRENCH REPAIR SPECIFICATION ARTERIAL STREET



TACK COAT

OR MINIMUM 5" - ALL MATERIALS USED TO

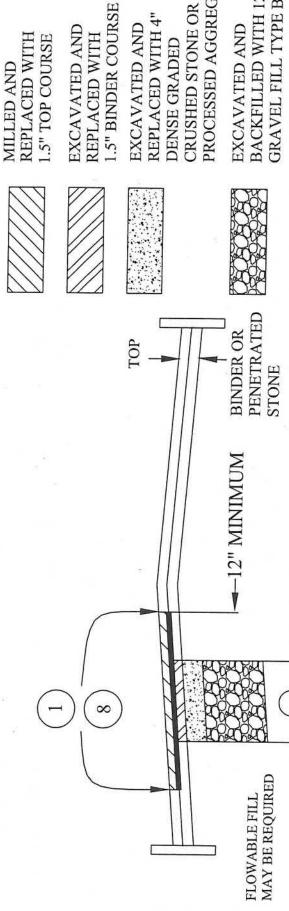
MEET MASS. STANDARD SPECIFICATIONS

FOR HIGHWAYS AND BRIDGES

- 1. SAW CUT OUTER EDGE OF UTILITY PATCH
 - 2. MILL TO REMOVE TOP COURSE
- 3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
- 4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM OF CROSS SECTION AS SHOWN ABOVE 5. REPLACE LAYERS OF GRAVEL, CRUSHED STONE AND BINDER
 - - 6. TACK AREA OF MILLING
- REPLACE TOP COURSE
- SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBBERIZED ASPHALT SEALANT
- 9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.

2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS (CONT.)

TRENCH REPAIR SPECIFICATION RESIDENTIAL STREET



PROCESSED AGGREGATE CRUSHED STONE OR REPLACED WITH 4" **EXCAVATED AND EXCAVATED AND** DENSE GRADED

BACKFILLED WITH 12" GRAVEL FILL TYPE B

TACK COAT

OR MINIMUM 3" - ALL MATERIALS USED TO REPLACE WITH SAME DEPTH OF ASPHALT

MEET MASS. STANDARD SPECIFICATIONS

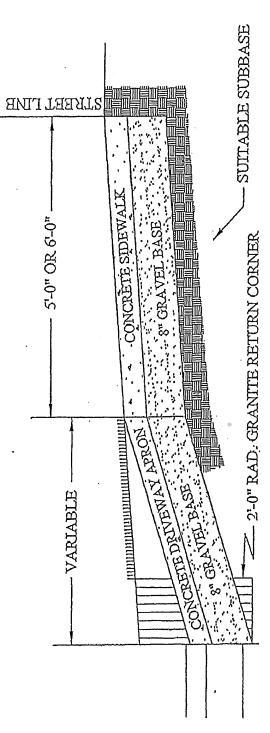
FOR HIGHWAYS AND BRDIGES

NOTES:

- I. SAW CUT OUTER EDGE OF UTILITY PATCH
- 2. MILL TO REMOVE TOP COURSE 3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE 4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM OF CROSS SECTION AS SHOWN ABOVE 5. REPLACE GRAVEL, CRUSHED STONE AND BINDER
- REPLACE TOP COURSE
- SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBBERIZED ASPHALT SEALANT
- 9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.

2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS (CONT.)

STANDARD SIDEWALK CONSTRUCTION AT COMMERCIAL DRIVEWAYS



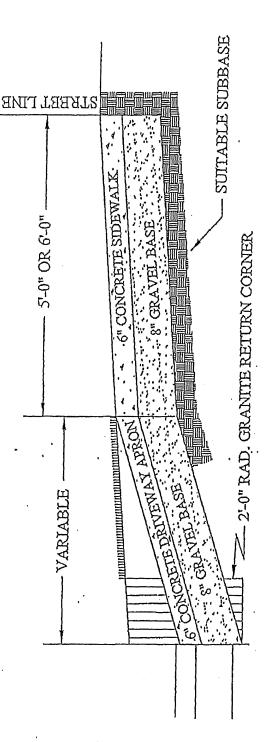
NOTES:

- 9" CONCRETE MAY BE REPLACED BY 6" ASPHALT IF APPROVED STANDARD SIDEWALK SLOPE IS 3/16 PER FT. MAXIMUM DRIVEWAY WIDTH IS 40' WITH TWO 2' CURB RETURNS (36' OPENING)
 - -#3 REINFORCEING BARS SHALL BE PLACED 12" O.C., 3" FROM GRAVEL BASE MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

口#0004

SPRINGFIELD, MA DPW 2-27-2006

STANDARD SIDEWALK CONSTRUCTION AT RESIDENTIAL DRIVEWAYS

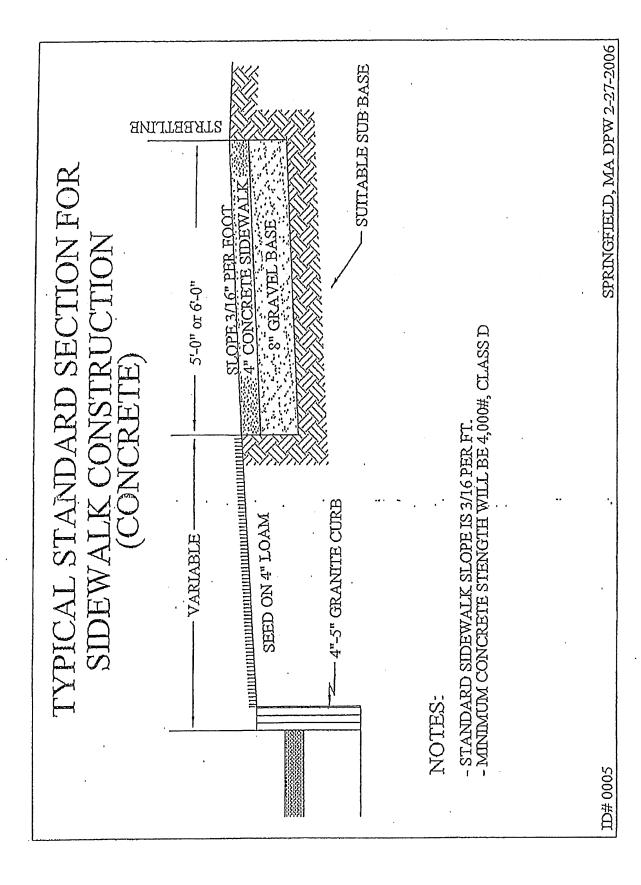


NOTES:

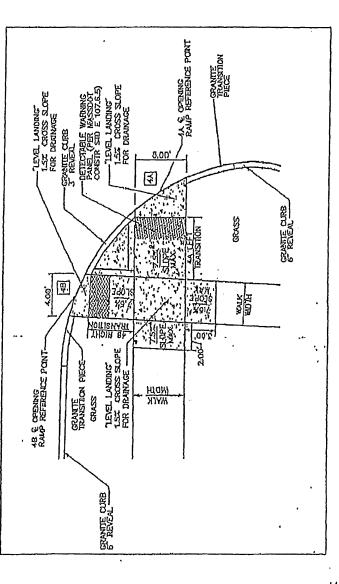
- 6" CONCRETE DEPTH TO BE REPLACED BY 3-1/2" ASPHALT(2" BINDER, 1- 1/2 TOP) AS DIRECTED BY THE ENGINEER. STANDARD SIDEWALK SLOPE IS 3/16 PER FT. MAXIMUM DRIVEWAY WIDTH IS 24' WITH TWO 2' CURB RETURNS (20' OPENING)
- - WIRE WELDED FABRIC PLACED 1-1/2" ABOVE GRAVEL BASE
 - MINIMUM CONCRETE STRENGTH.WILL BE 4,000#, CLASS D

8000 #日

SPRINGFIELD, MA DPW 2-27-2006



SIDEWALK REPAIR



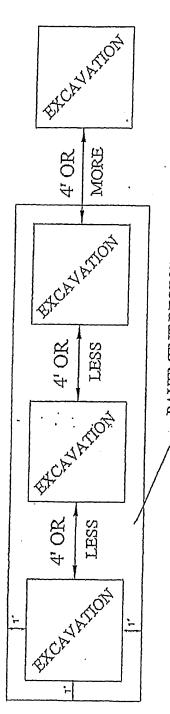
NOTES:

- IE EXCAVATION OCCURS ON A SIDEWALK AT AN INTERSECTION, CONTRACTOR IS REQUIRED TO REMOVE ENTIRE SIDEWALK WHEELCHAIR RAMP, ADJUST CURB, AND REPLACE TO CURRENT MASSDOT/A.D.A. GUIDELINES.
 - IF NO CURRENT RAMP EXISTS, CONTRACTOR IS REQUIRED TO INSTALL RAMP AND ADJUST CURB TO MEET CURRENT MASSDOT/A.D.A. GUIDELINES.
 - WIRE MESH REINFORCEMENT CONFORMING TO AASHTO-M55 OR ASTM A185-79 WILL BE REQUIRED.

ID# 0070

SPRINGFIELD, MA DPW 1-09-2012

MULTIPLE EXCAVATION REPAIR



-PAVEMENT RESTORATION REQUIREMENT

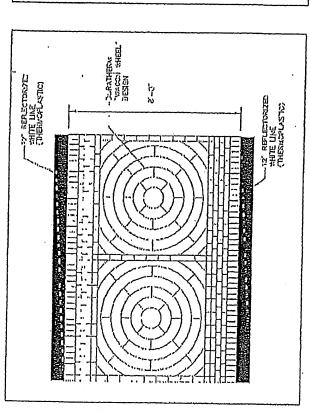
NOTES:

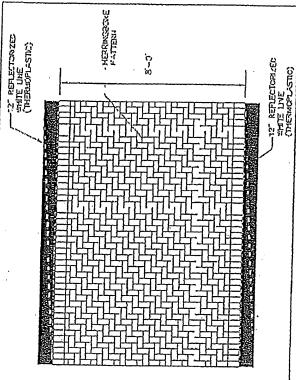
- APPLIES TO ANY ROADWAY EXCAVATION THAT RESULTS IN MULTIPLE PENETRATIONS PERMFORMED LESS THAN 4' OF ONE ANOTHER UNDER A SINGLE PERMIT.
- APPLIES TO ANY ROADWAY EXCAVATIONS THAT ARE PERMORMED WITHIN 2 MONTHS OF ANY OTHER PERMIT ISSUED TO THE SAME CONTRACTOR/UTILITY AT A SPECIFIC LOCATION.
 - EXISTING PAVEMENT REMAINING SHALL BE MILLED AND OVERLAYED (1.5" RESIDENTIAL + 2" ARTERIAL) AS SHOWN ABOVE.

ID# 0071

SPRINGFIELD, MA DPW 1-09-2012

IMPRINT OR INLAYED CROSSWALK REPAIR





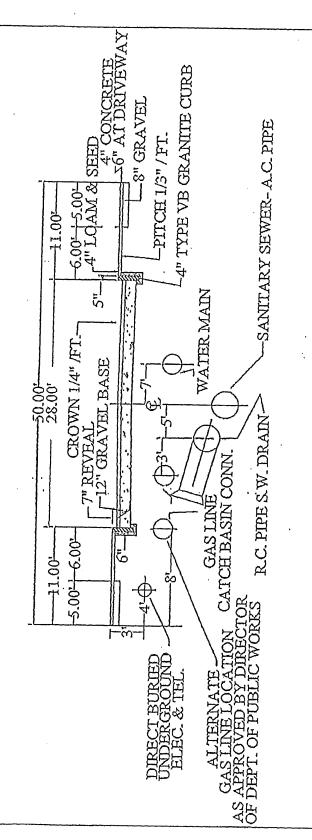
NOTES:

- IF ANY EXCAVATION OR SURFACE PAVEMENT IMPROVEMENT OCCURS OF ANY LOCATION WITHIN THE CITY OF SPRINGFIELD WHERE EXISTING IMPRINTED OR INLAYED CROSS WALKS EXIST, THE CONTRACTOR IS REQUIRED TO REPLACE INKIND WITH THE EXACT MATERIAL AND COLOR AS ORIGNALLY INSTALLED.
 - INSTALLATIONS MUST BE COMPLETED BY AN INSTALLER APPROVED BY THE CITY OF SPRINGFIELD.
- ABUTIING PAVEMENT MARKINGS MÛST ALSO BE REPLACED.

ID# 0072

SPRINGFIELD, MA DPW 1-09-2012

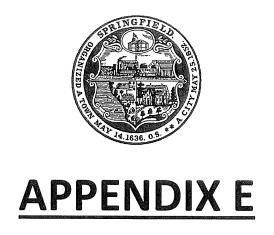
STREET TYPICAL SECTION FOR UTIL



- WHERE PRACTICABLE STORMWATER LINES ARE PLACED 5' OFF THE CENTER LINE
- ON THE SOUTH OR WEST SIDE OF THE STREET WATER MAINS ARE 18' OFF STREET LINE, EITHER NORTH OR EAST SIDE OF THE STREET
- CONNECTIONS FROM CATCH BASINS TO MANHOLES- V.C. PIPE- CLASS 200-64T OR EQUAL SURFACE COURSE 3" TYPE I BIT. CON. LAID IN TWO COURSES- 1 1/2" TOP COURSE
 - 11/2" BINDER COURSE

D#0032

SPRINGFIELD, MA DPW 2-27-2006



MOBILE FOOD TRUCK VENDOR PERMIT APPLICATION FORM

CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION MOBILE FOOD TRUCK VENDOR PERMIT APPLICATION FORM

	1000 200
1 100.05	7

		D TRUCK VENDOR PERMIT APE	<u>PLICATION FORM</u>
Re	quired Information:		11 15 1636, 05
1.	Date of Application:		
2.	Name of Responsible	Person .	
	Applying for Permit:		
3.	Applicant / Company,		
4.	Organization (If applic Applicant Address:	able):	
41 ,	Applicant Address:		
5,	Phone Number: Offi	ce / Home:	
	Cell		
6.	Start Date:		
7			
7.	End Date:		•
8.	Street Permit Location, Map, SPECIFIC PARKING SPACE LOCATION MUS IDENTIFIED:	G	
9.	List Two adjacent Side S		
	(Example Birnie Ave. be		
10	Walther St and Wason		
10.	Required Information:		
	To be submitted with	Vehicle Insurance:	
	initial application and	Springfield Fire Department Permit (if re	
	all renewals	Springfield Health and Human Services F	
11	Fac Calaulatian	Springfield Police Department (Hawkers	
11.	_	pplication Fee (not required if renewal):	\$ 75
	Qί	arterly Fee	\$ 150
-		Total:	\$ 225 Initial application - \$ 150 if renewal
Auth	<u>INVALID V</u> orized Signature:	VITHOUT APPLICANT SIGNATURE AND FL	JLL PAYMENT
, acii	orized digitature.		
Perso Occup	on above agrees to abide pancy of Public Ways wi	by all DPW permit regulations and fees thin the City of Springfield" – Latest Edition	as outlined in the "Manual for on

Applicant Check Number:

APPENDIX G MA DEP Policy CG-8



ARGEO PAUL CELLUCCI Governor

JANE SWIFT Lieutenant Governor

COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS DEPARTMENT OF ENVIRONMENTAL PROTECTION

ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

BOB DURAND Secretary LAUREN A. LISS Commissioner

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF RESOURCE PROTECTION
DIVISION OF MUNICIPAL SERVICES POLICIES

POLICY MEMORANDUM NO. CG-8

PAVEMENT

All roads and trenches therein shall be refilled and repaved in accordance with specifications provided by the owner in the contract documents. Please note that this policy <u>may</u> be excludable on Federally assisted projects where bid alternative items may be required (i.e. trench width vs. full width pavement). You are advised to seek project specific clarification.

Loan eligibility shall be limited to the following:

A. Where the depth of the pipe invert is 0 to 8', the maximum pavement widths which shall be eligible for financial assistance are as follows:

Nominal Pipe Diameter

Maximum Eligible Widths

Initial Pavement

Permanent Trench 8'-6"

0-24"

4" 6'-6"

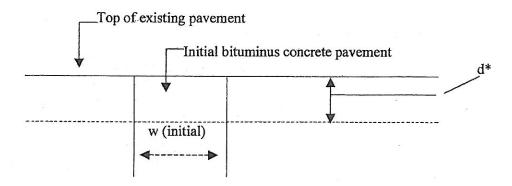
Where the nominal pipe diameter is greater than 24" the maximum eligible width for Initial re-paving shall be the nominal diameter of the pipe plus four (4) feet, and for permanent trench repaving the maximum eligible width shall be the nominal pipe diameter plus six (6) feet.

B. For each additional four (4) feet (or fraction thereof) of pipe invert depth, add three feet to the eligible width limits stated in paragraph A.

DEP-DMS-CG's - Page 4

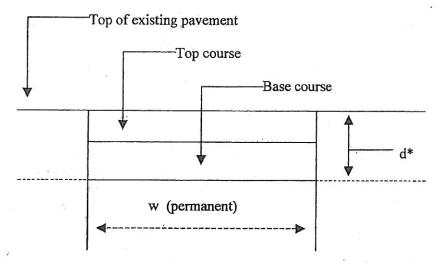
At the design phase of a project the owner has the option to elect either Initial Pavement with Option I (Permanent Trench replacement) or Initial with Option II (curb to curb over initial)

Initial Pavement



d*= depth of existing pavement to a maximum of 3 inches (see general notes #3) w = maximum eligible <u>Initial pavement width</u> as described in paragraphs "A" & "B" on page DEP-DMS-CG's-P4.

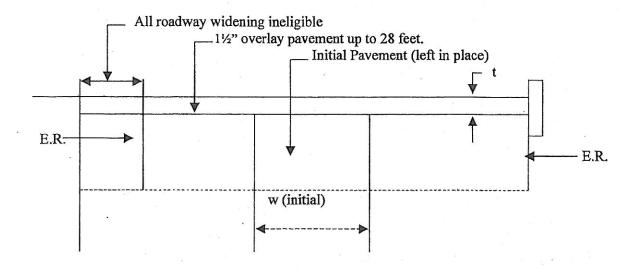
OPTION I Permanent Trench Pavement



d*= depth of existing pavement trench to a maximum of 3 inches (see general notes #3)
w = maximum eligible permanent pavement width as described in paragraphs "A" & "B".
equals initial width plus 2 feet and includes:

- Cutting edges for the permanent trench
- Removal of initial patch plus two feet of existing pavement
- Fine grading/compacting gravel
- Placement of Permanent Trench pavement in two courses.

OPTION II Curb to Curb Pavement (overlay pavement for roadways up to 28 feet)



E.R.= edge of existing paved roadway t =one and one half inch (1½") overlay of bituminus concrete pavement

GENERAL NOTES:

- 1. Repayement of settled areas and crown restoration within the trench limits shall be the responsibility of the contractor.
- 2. Leveling outside the trench limits shall be the responsibility of the owner.
- 3. Sewer trench re-fill and pavement re-paving on public ways under the jurisdiction of the Massachusetts Department of Public Works, the Metropolitan District Commission, or other such agency shall be in accordance with permit(s) issued therefor by that Department or Commission, as the case may be.
- 4. The Division will consider requests for increase in the participating pay limits defined in paragraphs A and B, when such increases are, in the Division's opinion, reasonable. Such requests should be documented in writing and submitted to the Division in a timely manner.
- 5. Projects which deviate from the above options are required to seek Division review and approval.

<u>APPENDIX H</u> Traffic Management Plans

APPENDIX I TRAFFIC MANAGEMENT PLANS AND LOOP DETECTOR DETAILS

LEGEND

- CONSTRUCTION SIGN
- O REFLECTORIZED DRUM
- → DIRECTION OF TRAFFIC FLOW
- P POLICE OFFICER

FLASHING ARROW BOARD

-- PORTABLE TYPE III BARRICADE

→ PORTABLE TYPE III BARRICADE WITH SIGN

₩ WORK ZONE

BUFFER

 $L = WS^{2}/60$ FOR ROADS OF

40 MPH OR LESS

L = WS FOR ROADS OF

45 MPH OR MORE

WHERE: L = MINIMUM LENGTH OF TAPER

S = NUMERICAL VALUE OF POSTED SPEED

W = LANE WIDTH REDUCTION

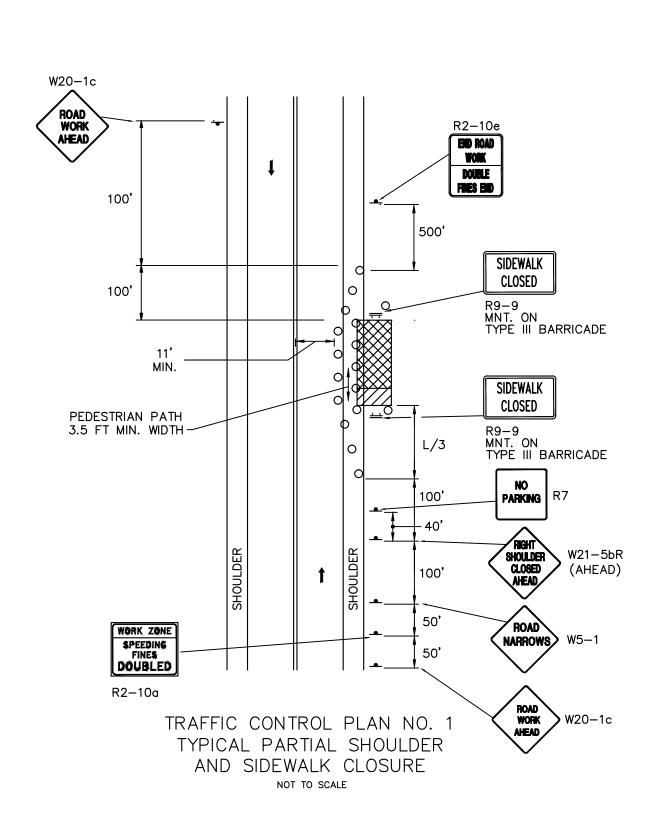
NOTES:

- 1. THE CONTRACTOR SHALL EXCAVATE ONLY AS MUCH ROADWAY AS HE IS ABLE TO INSTALL PIPE AND BACKFILL BY THE END OF THE SAME WORK DAY.
- 2. AT THE COMPLETION OF EACH DAYS CONSTRUCTION ACTIVITIES, THE ROADWAY SURFACE SHALL BE PATCHED AND RE-OPENED TO TRAFFIC.

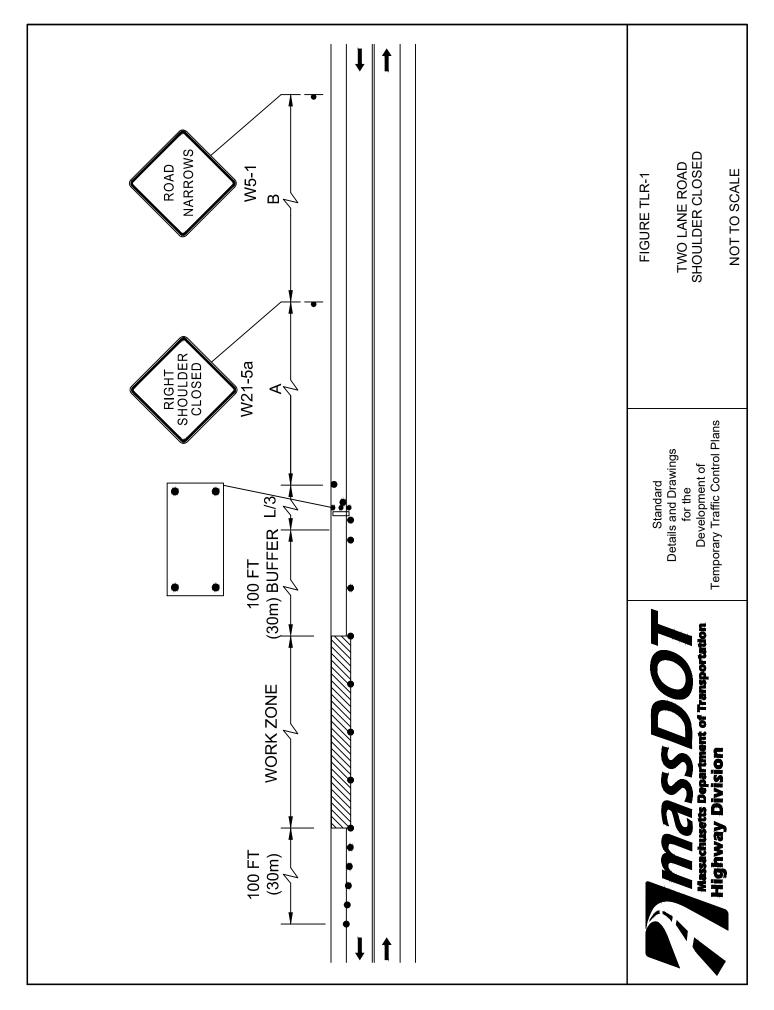
BUFFER ZONE LENGTH

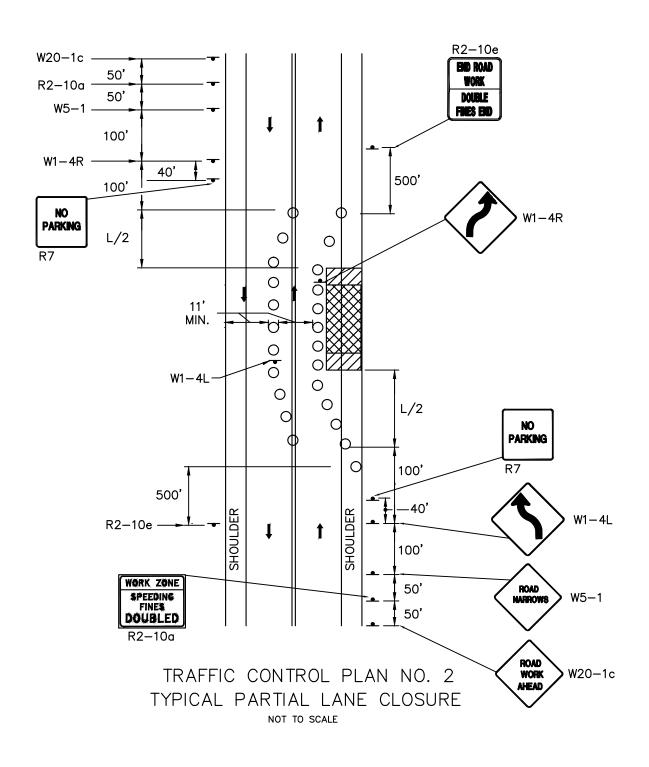
SPEED*	DISTANCE
(mph)	(ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820



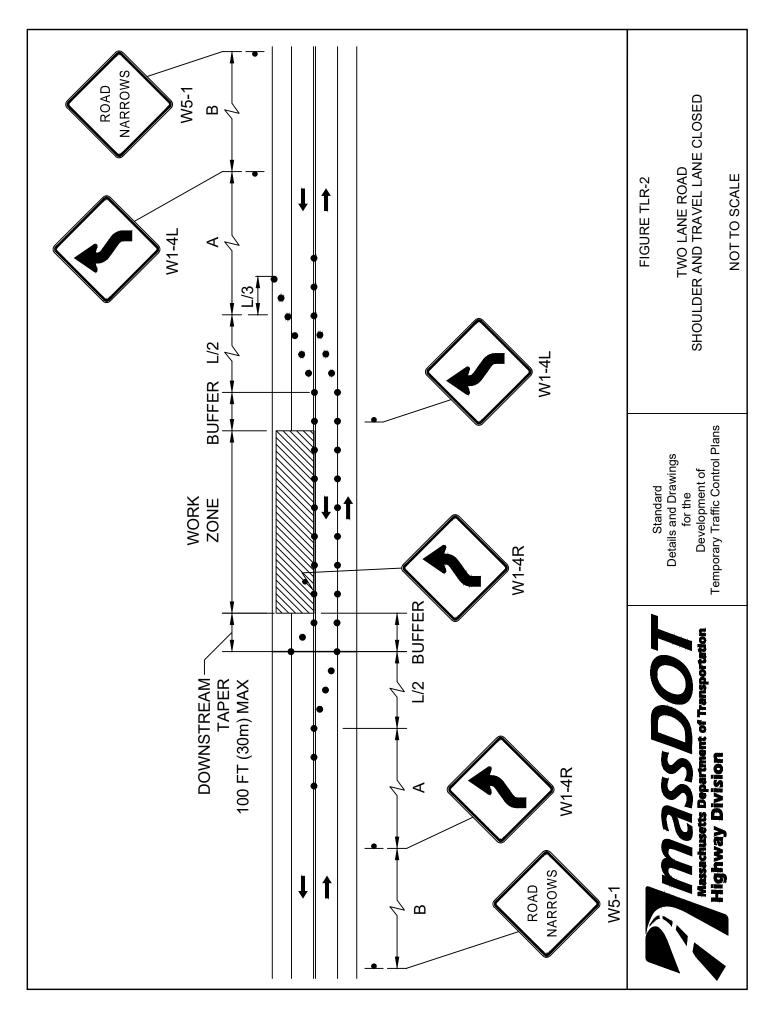


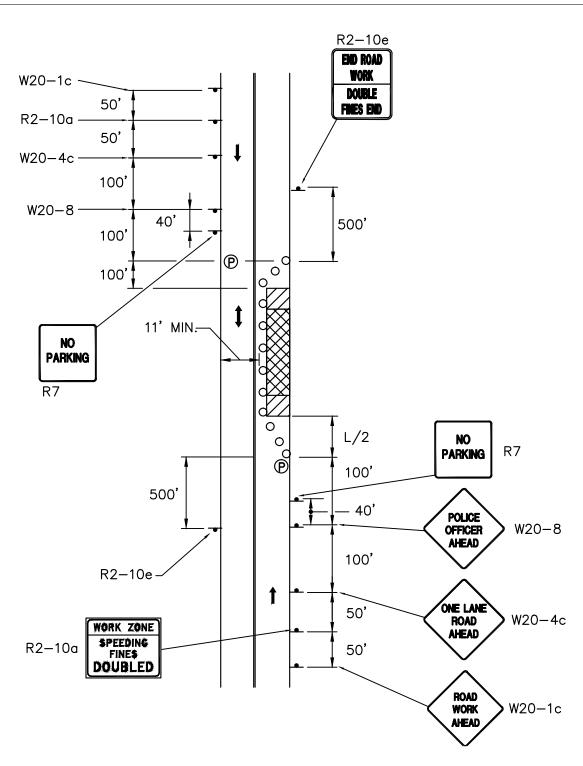








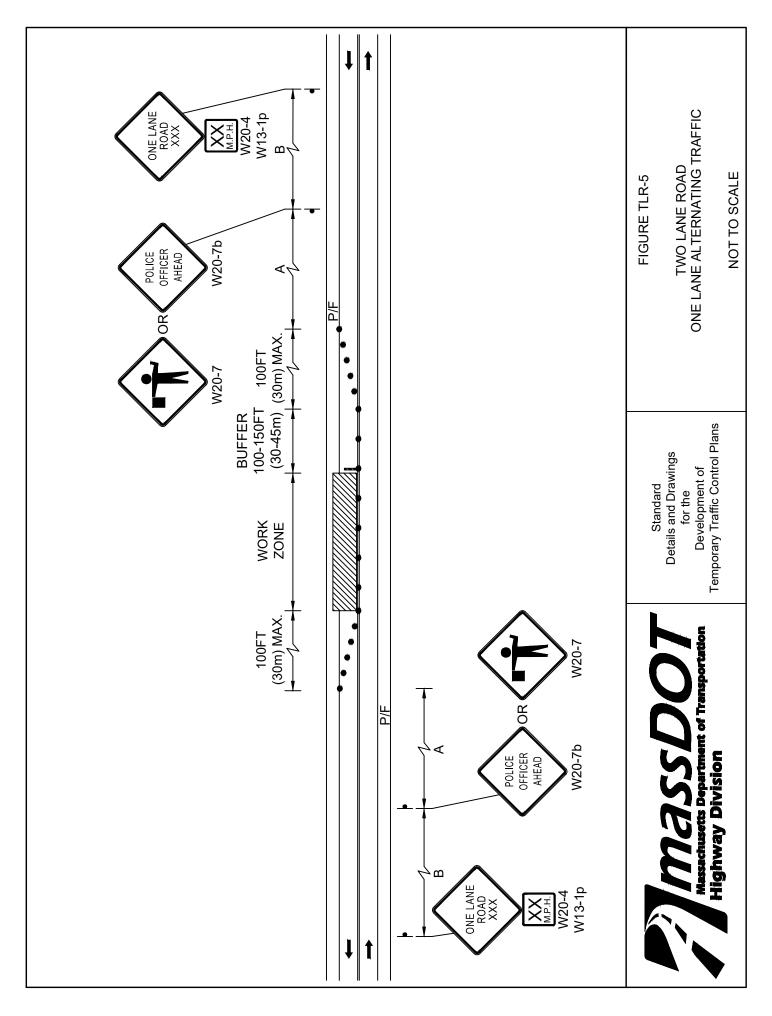


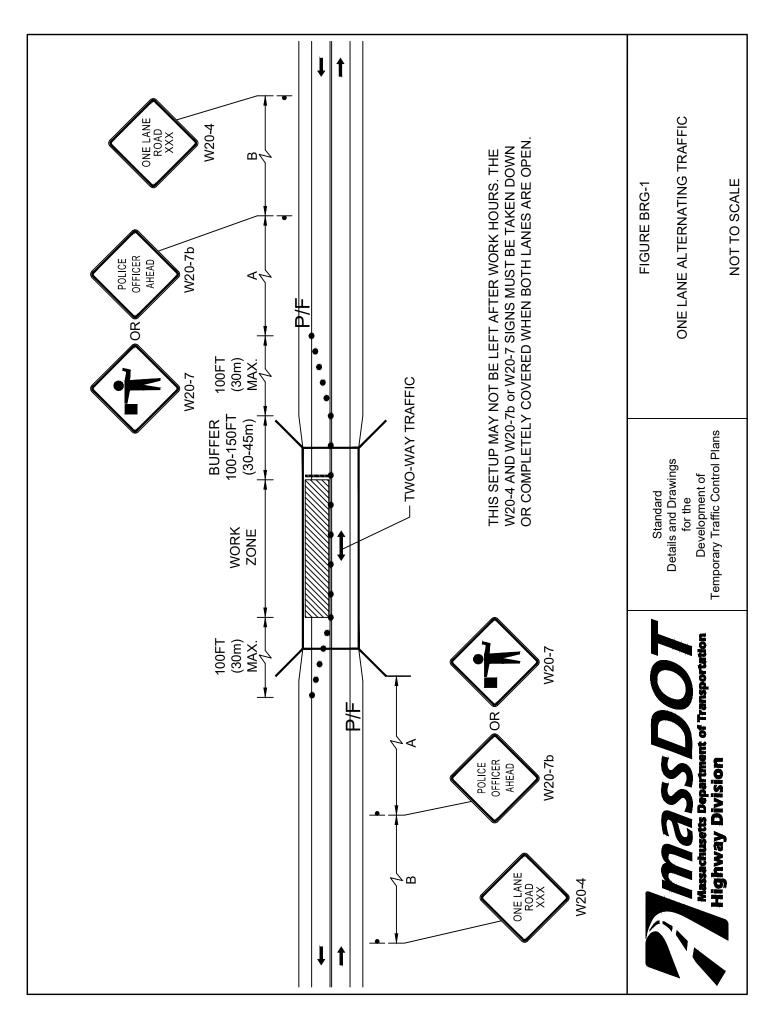


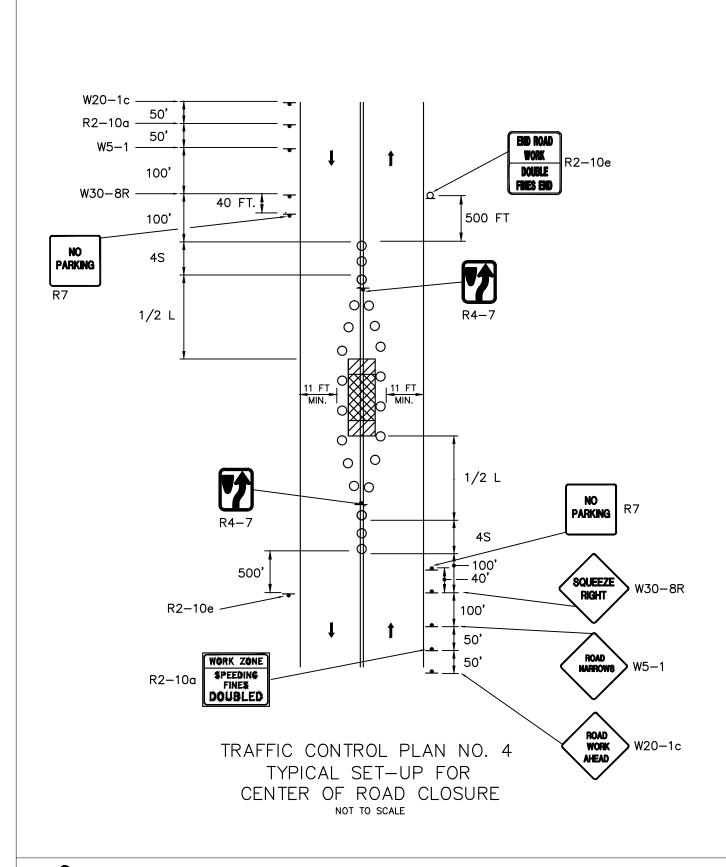
TRAFFIC CONTROL PLAN NO. 3

TYPICAL SET-UP FOR
ALTERNATING ONE WAY TRAFFIC
NOT TO SCALE











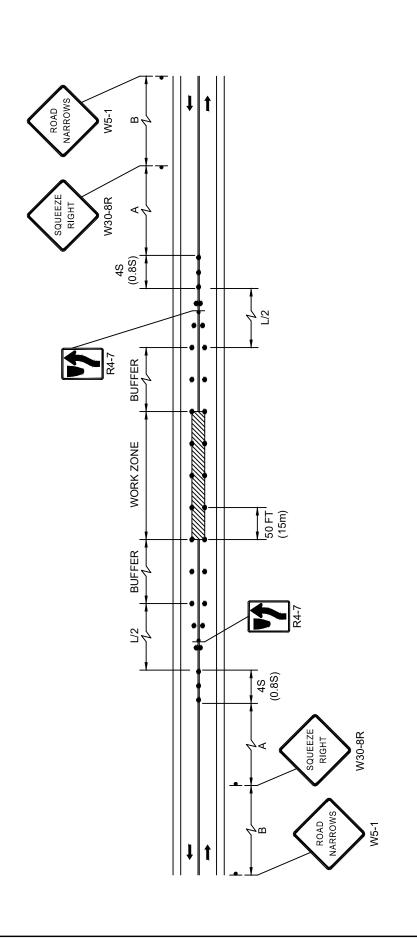


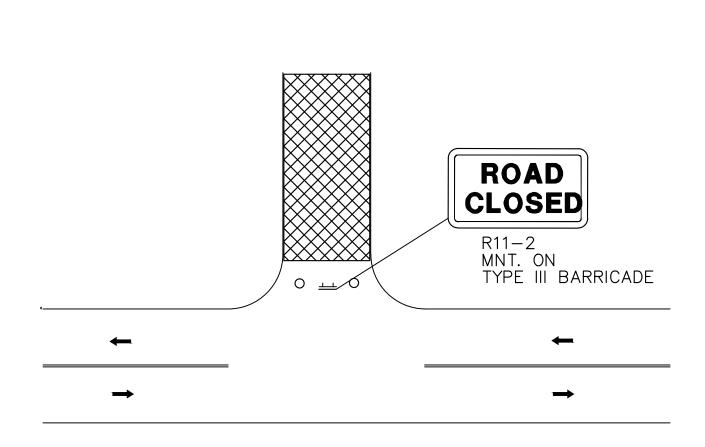
FIGURE TLR-3

TWO LANE ROAD CENTER OF ROAD CLOSURE

NOT TO SCALE



Standard Details and Drawings



TRAFFIC CONTROL PLAN NO. 5 ROAD CLOSURE NOT TO SCALE



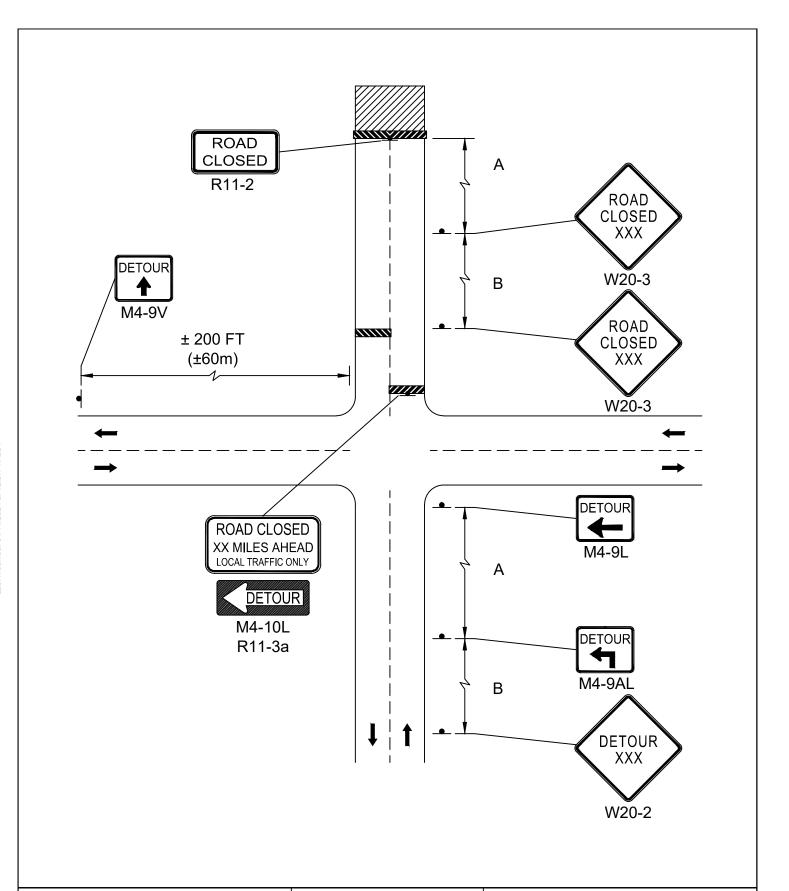
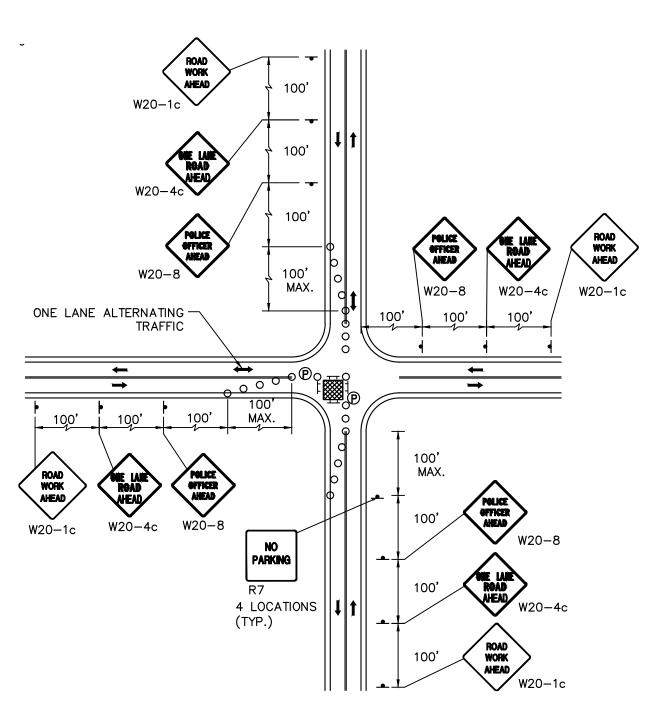




FIGURE D-1

DETOUR ADVANCE SIGNING



TRAFFIC CONTROL PLAN NO. 6
SINGLE LANE APPROACH
ONE QUADRANT CLOSURE
WITH POLICE DETAIL
NOT TO SCALE



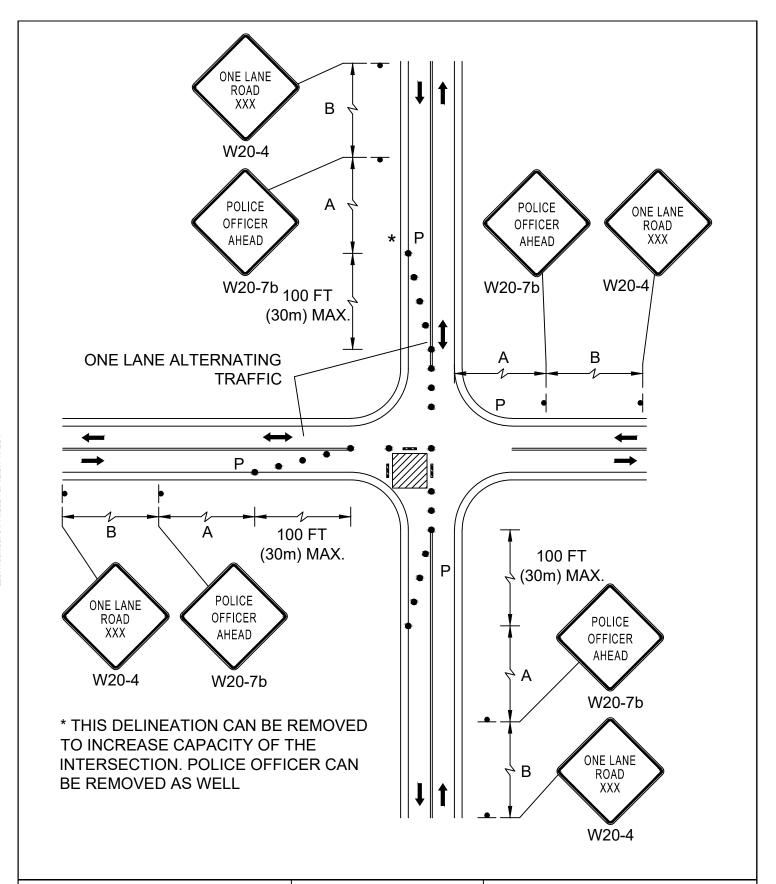
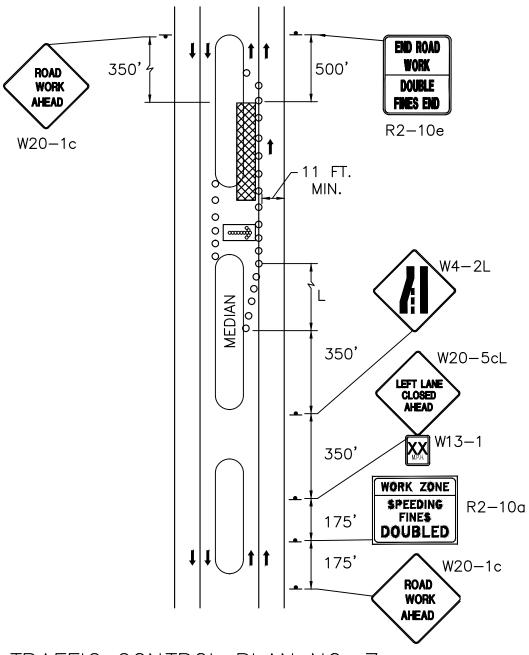




FIGURE INT-2

SINGLE LANE APPROACH ONE QUADRANT CLOSURE



TRAFFIC CONTROL PLAN NO. 7
INTERIOR LANE CLOSURE
ON MULTI-LANE STREET
NOT TO SCALE



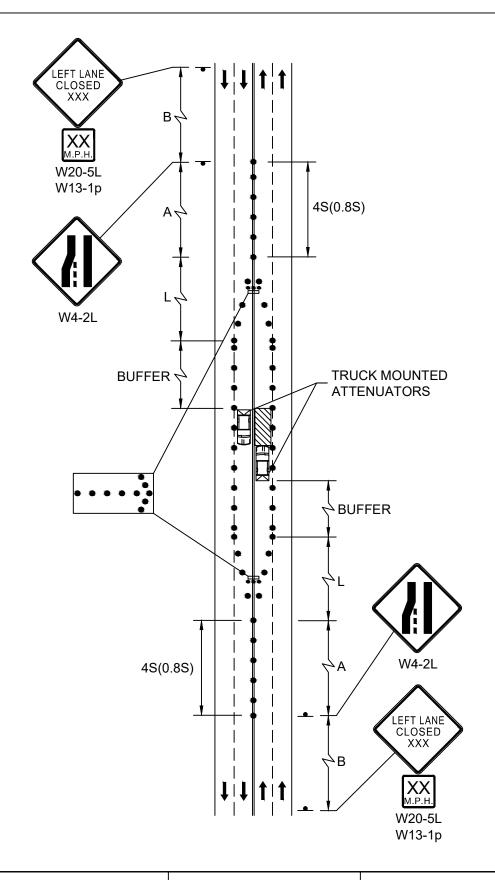
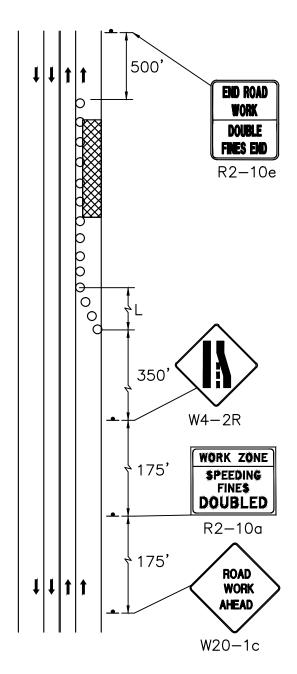




FIGURE MLR-1

MULTIPLE LANE ROAD INTERIOR LANE CLOSURE



TRAFFIC CONTROL PLAN NO. 8
EXTERIOR LANE CLOSURE
ON MULTI-LANE STREET
NOT TO SCALE



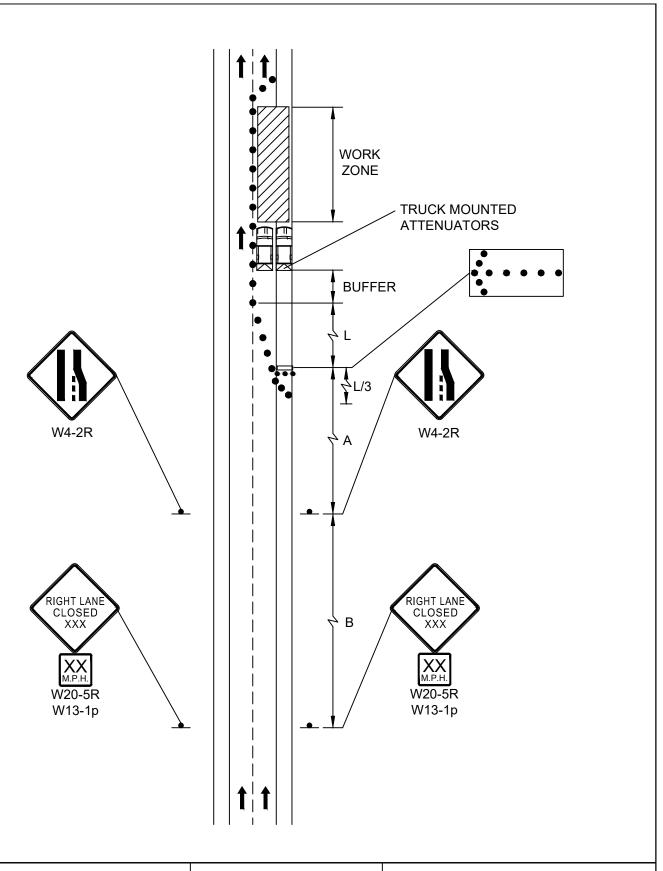




FIGURE DIV-2

DIVIDED HIGHWAY / LANE CLOSURE (SHORT TERM)

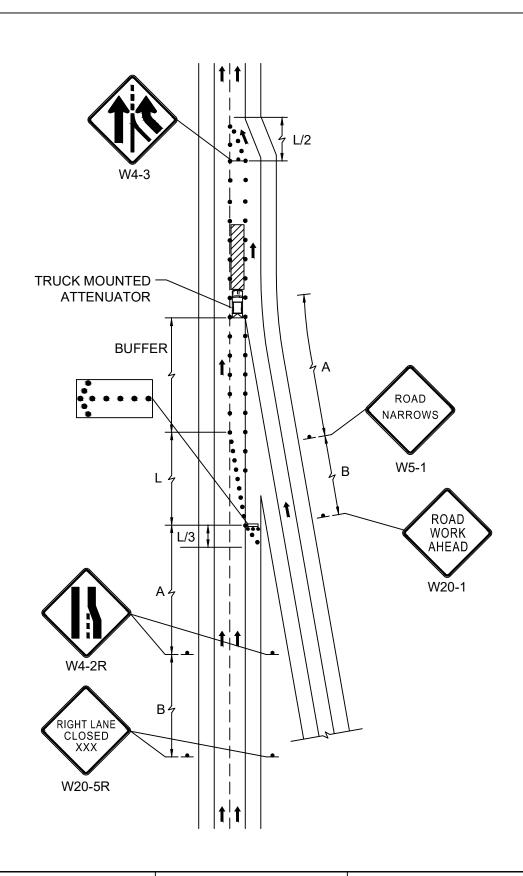
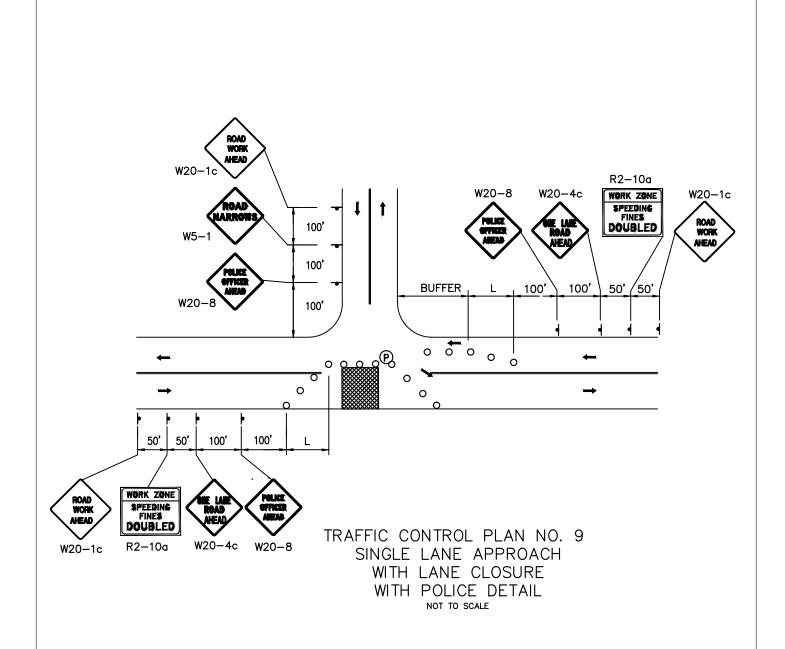




FIGURE R-1

WORK AT ENTRANCE RAMP





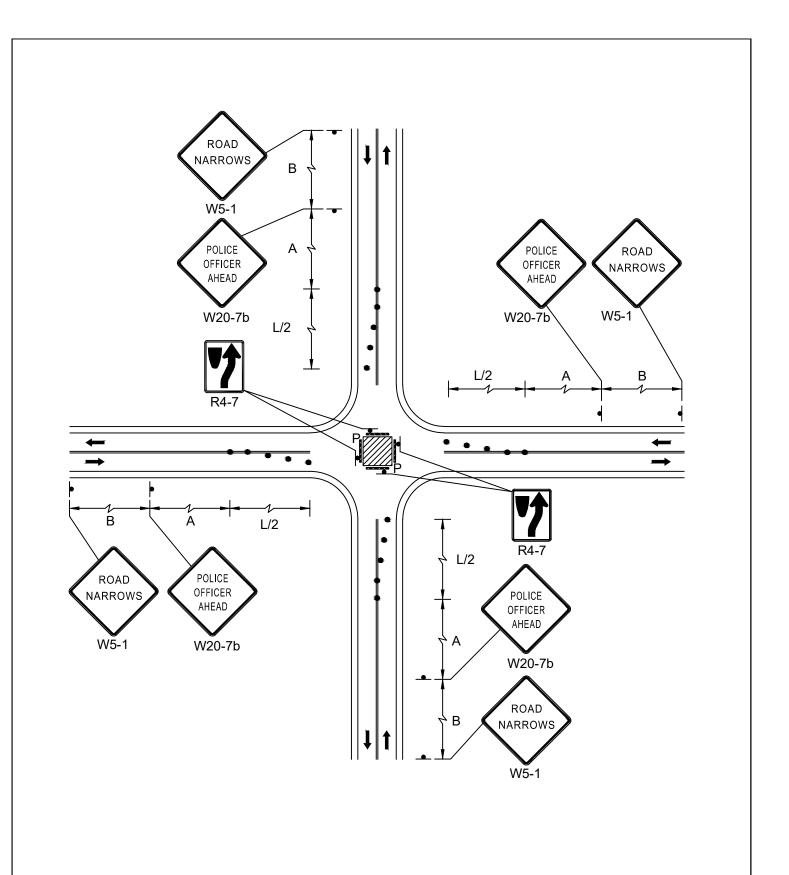




FIGURE INT-1

SINGLE LANE APPROACH CENTER CLOSURE

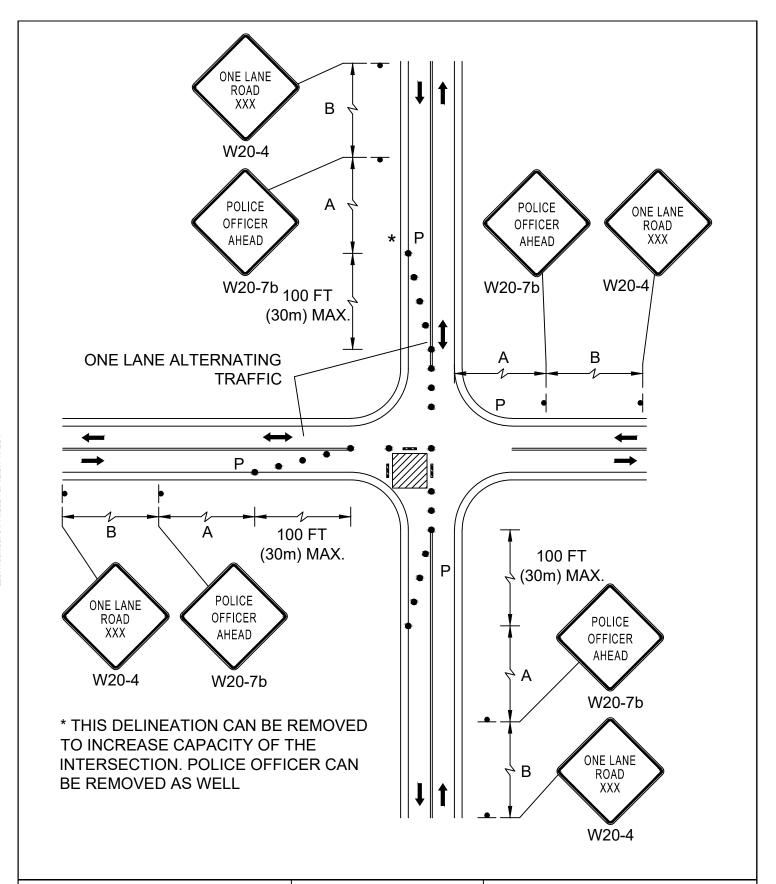
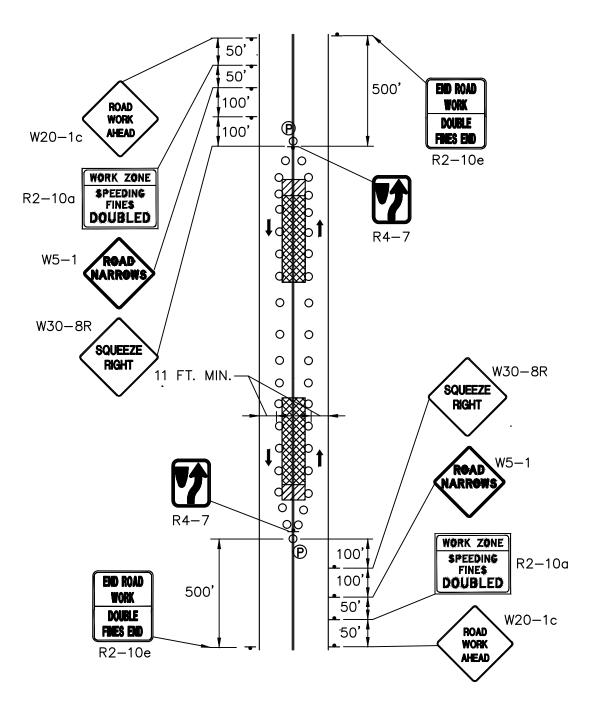




FIGURE INT-2

SINGLE LANE APPROACH ONE QUADRANT CLOSURE



TRAFFIC CONTROL PLAN NO. 10

TYPICAL SET-UP FOR

PIPE LINING IN CENTER OF ROADWAY

NOT TO SCALE



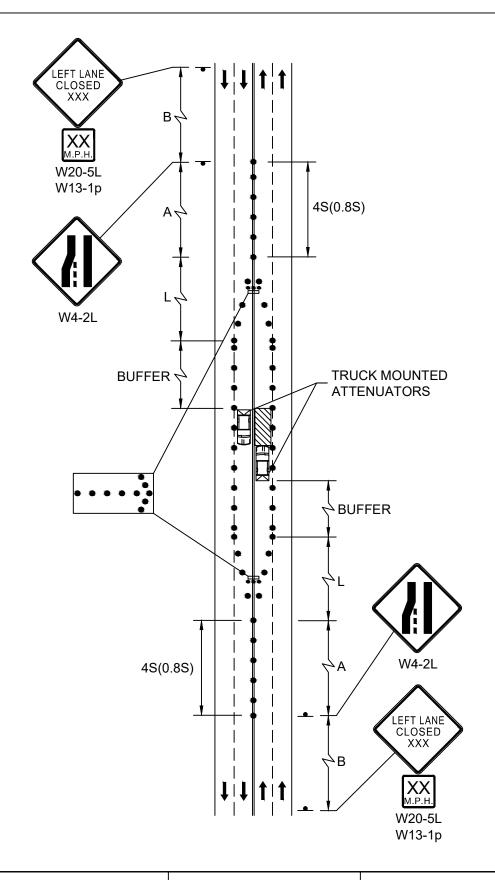
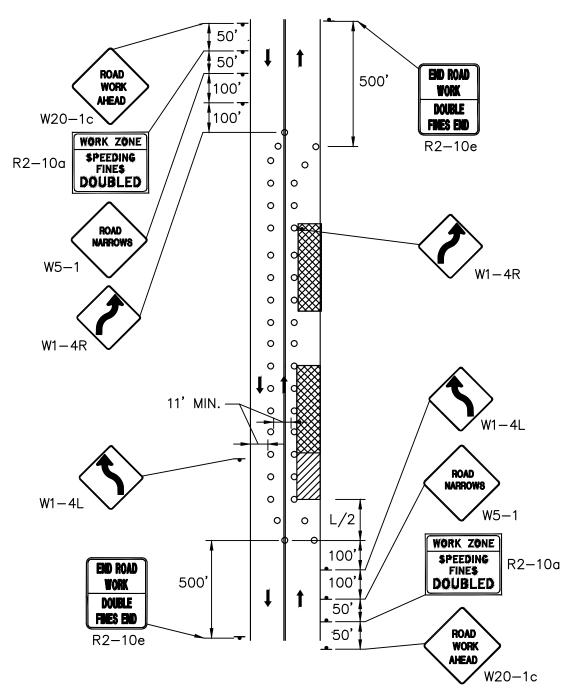




FIGURE MLR-1

MULTIPLE LANE ROAD INTERIOR LANE CLOSURE



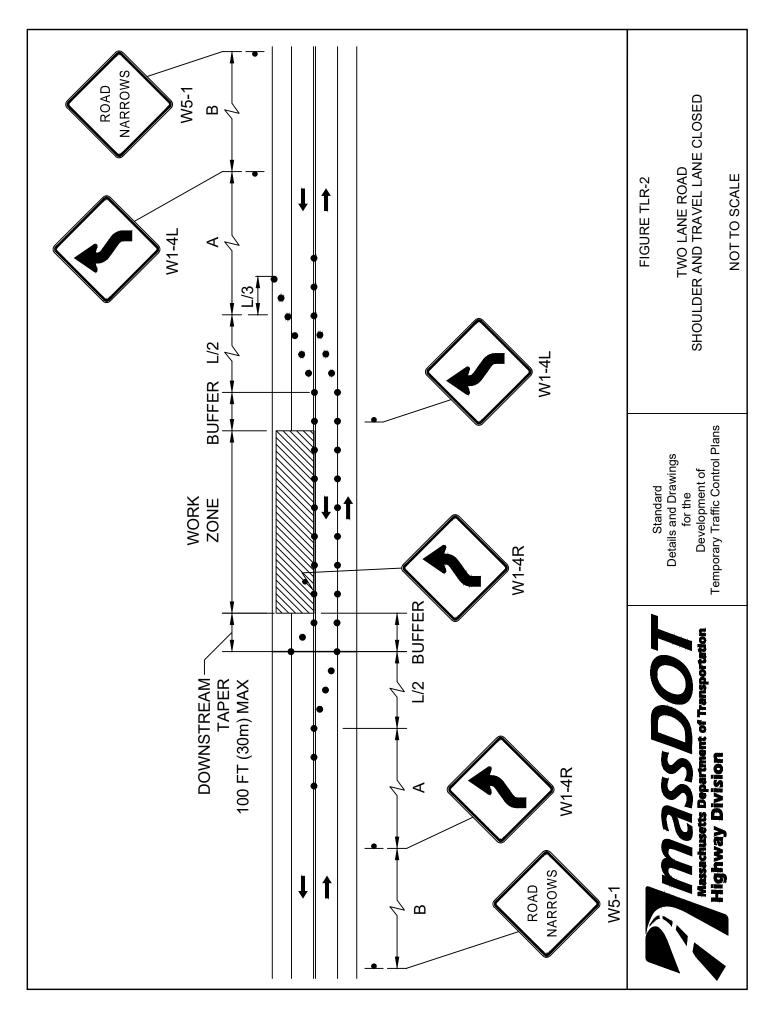
TRAFFIC CONTROL PLAN NO. 11

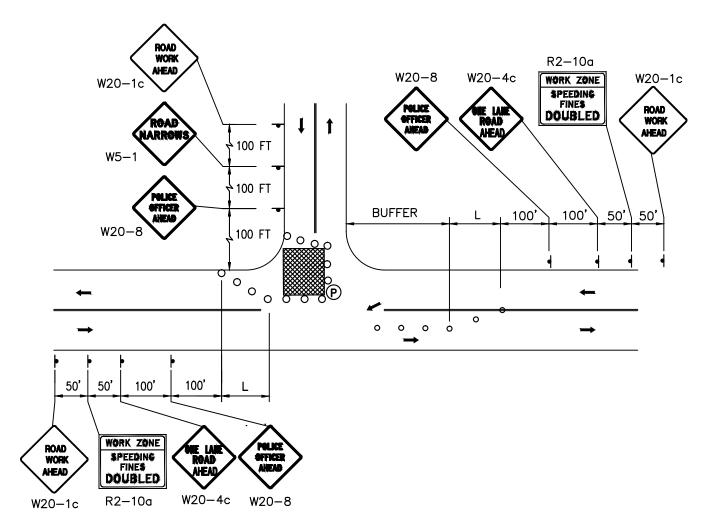
TYPICAL SET-UP FOR

PIPE LINING ON SIDE OF ROADWAY

NOT TO SCALE







TRAFFIC CONTROL PLAN NO. 12 SINGLE LANE APPROACH WITH LANE CLOSURE WITH POLICE DETAIL NOT TO SCALE



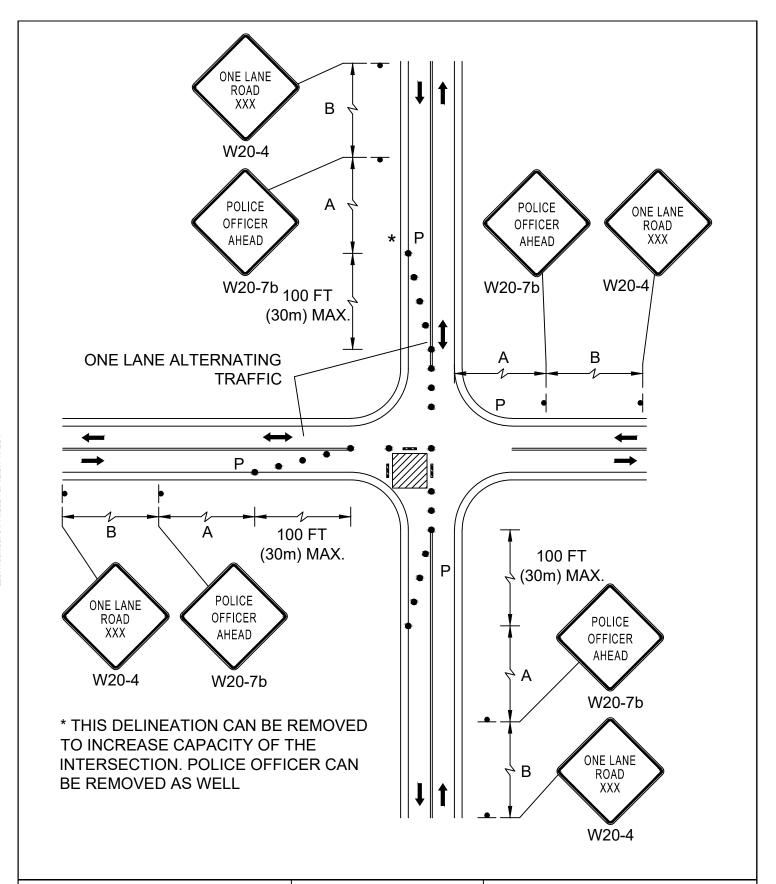




FIGURE INT-2

SINGLE LANE APPROACH ONE QUADRANT CLOSURE

CONSTRUCTION SIGN SUMMARY

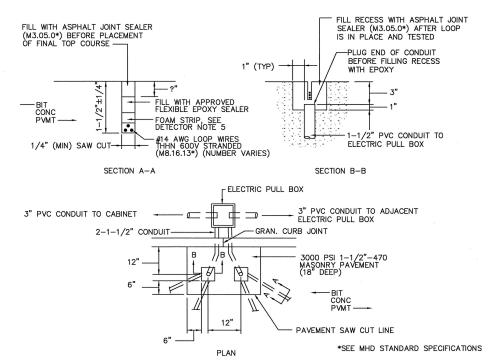
IDENTIFI-	SIZE OF SIGN		ТЕХТ	TEXT DIMENSIONS			NUMBER OF	COLOR			POST SIZE AND	AREA IN
CATION NUMBER	WIDTH	HEIGHT	IEAI	LETTER HEIGHT	VERTICAL SPACING	ARROW	□ SIGNS	BACK- GROUND	LEGEND	BORDER	NUMBER REQUIRED	SQUARE FEET
W20-1c	36"	36"	1000		CURRENT		4		CURRENT	MUTCD		36.00
W1-4L	30"	30"	\$				2					12.50
W1-4R	30"	30"	②				2					12.50
W4-2L	36"	36"					1					9.00
W4-2R	36 "	36"					1					9.00
W5-1	36°	36"					2					18.00
W20-4c	36"	36"					4					36.00
W20-8	36"	36"		SEE Mo	assDOT ST	TANDARDS	4	SEE M	assDOT S1	ANDARDS		36.00
W21-5bR	36"	36"		SEE 	CURRENT	MUTCD	1	SEE.	CURRENT	MUTCD		9.00
W30-8R	36"	36"	SCHEZZ RIGHT				2					18.00
W20-5cL	36"	36"					1					9.00
W13-1	24"	30"	XX				1	•				5.00



CONSTRUCTION SIGN SUMMARY

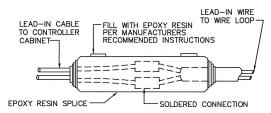
IDENTIFI-			TEVE	TEXT DIMENSIONS			NUMBER OF	COLOR		POST SIZE AND	AREA IN	
CATION NUMBER	WIDTH	HEIGHT	TEXT	LETTER HEIGHT	VERTICAL SPACING	ARROW	SIGNS REQUIRED	BACK- GROUND	LEGEND	BORDER	POST SIZE AND NUMBER REQUIRED	SQUARE FEET
R2-10a	48"	36"	WORK ZOME APEZDING FINES DOMAINLED	SEE Mo	ISSDOT STA	ANDARDS	2	SEE Mo	ssDOT STA	NDARDS		24.00
R2-10e	36"	48"	TO TAKE THE OWNE PRES TO	SEE Mo	ISSDOT STA	ANDARDS	2	SEE Mo	ssDOT STA	INDARDS		24.00
R4-7	24"	30"	7	SEE	CURRENT I	MUTCD	2	SEE	CURRENT I	MUTCD		10.00
R9-9	30"	18"	SIDEWALK CLOSED				2					7.50
R11-2	48"	30"	ROAD	ļ ļ		,	1			,		10.00
R7	36"	36"	NO PARKING	6"C 6"C	10" 4" 10"		2	WHITE	RED	RED		18.00
												303.50





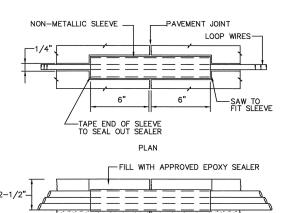
CONDUIT AND LOOP WIRE CONNECTION BLOCK DETAILS

NOT TO SCALE



SPLICE DETAIL FOR WIRES AND LEAD-IN CABLE

NOT TO SCALE



SLEEVE DETAILS FOR PAVEMENT JOINTS



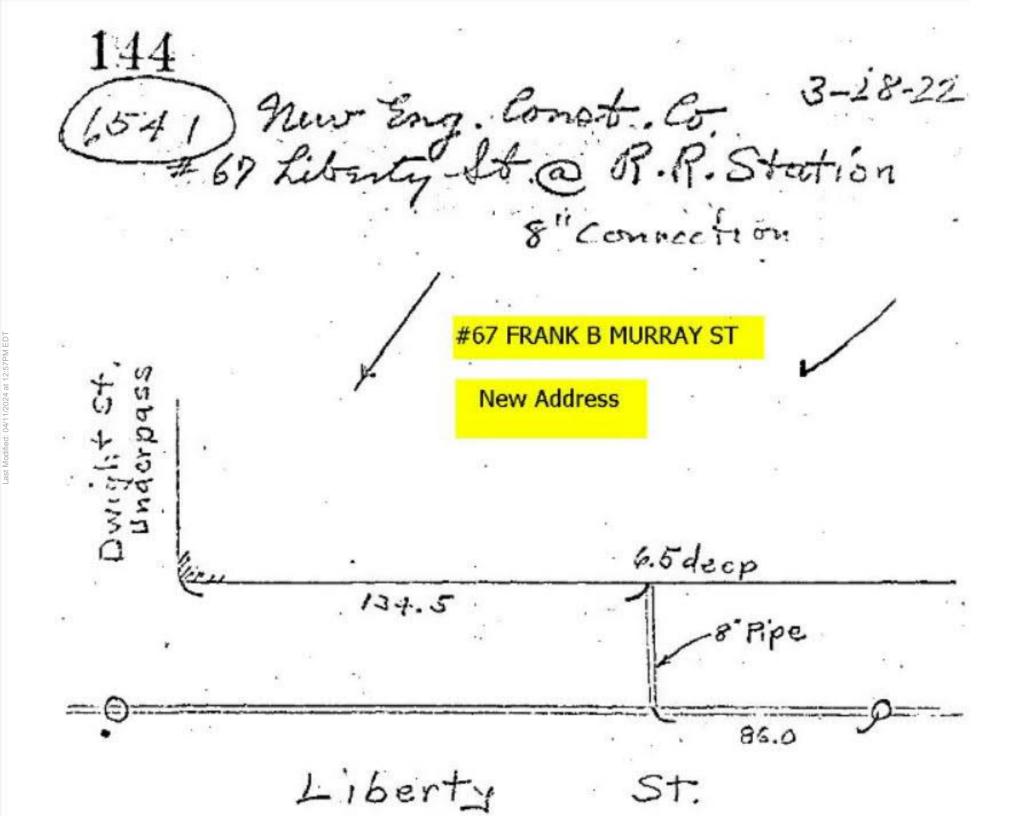
LOOP DETECTOR NOTES:

- 1. IN PULL BOX OR BASE, SPLICE ALL SEGMENTS TO ONE TYPE ELEVEN— SHIELDED LOOP DETECTOR LEAD—IN CABLE. SEGMENTS SHALL BE SPLICED IN A COMBINATION OF PARALLEL AND SERIES, AS REQUIRED TO MATCH THE INDUCTANCE OF THE DETECTOR AMPLIFIER, PER MANUFACTURER'S RECOMMENDATION. NUMBER OF TURNS OF WIRE IN SEGMENTS SHALL ALSO FOLLOW THE RECOMMENDATION OF THE DETECTOR AMPLIFIER MANUFACTURER.
- LEAD-IN WIRES SHALL BE TWISTED FROM SEGMENT TO SPLICE WITH SHIELDED CABLE, THREE TURNS PER FOOT. LEAD-IN CABLE FROM PULL BOX TO CONTROLLER SHALL BE TYPE ELEVEN (M.8.16.11).
- 3. THE METALLIC SHIELD WHICH SHALL ENCASE THE DETECTOR LEADS FROM A SPLICE (TYPICALLY LOCATED IN A ELECTRIC PULL BOX NEAR THE ROADWAY COMPONENT OF THE DETECTOR) TO THE CONTROLLER, AND THE DRAIN WIRE UNDER THE METALLIC SHIELD, SHALL BE FIRMLY BONDED TO THE EARTH GROUNDING BUSS IN THE CONTROLLER. HOWEVER, THE SHIELD AND DRAIN WIRE SHALL BE CAREFULLY INSULATED FROM THE TRANSFORMER NEUTRAL OR FROM EARTH GROUND AT ALL OTHER POINTS ALONG ITS LENGTH. SPECIFICALLY, THIS INCLUDES CAREFUL INSULATION OF THE EXPOSED PORTION OF THE SHIELD AND THE DRAIN WIRE AT THE END AWAY FROM THE CONTROLLER WHERE IT IS SPLICED TO WIRES LEADING TO THE ROADWAY COMPONENT OF THE DETECTOR. THIS IS IMPORTANT TO AVOID A GROUND
- 4. FILL ALL CONDUIT OPENINGS WITH DUCT SEAL.
- 5. AFTER SAW CUTS ARE COMPLETE, BLOW OUT CUTS WITH OIL AND WATER FREE COMPRESSED AIR UNTIL CUTS ARE CLEAN AND DRY. INSERT WIRE INTO CLEAN SLOT WITH A BLUNT, SMOOTH, ROUND EDGED TOOL OF WOOD OR PLASTIC SUCH AS A PAINT STIRRER. DO NOT USE A SCREWDRIVER. THEN INSERT FOAM PLASTIC HOLD DOWN STRIPS, SIMILAR TO ETHA FOAM SB, STRIPS SHALL BE ABOUT 2 INCHES LONG, PLACED IN THE SLOT ABOUT EVERY 2 FEET THEN POUR EPOXY FILLER, TAKING CARE TO ELIMINATE BUBBLES. THEN FINISH WITH ASPHALT FILLER.
- 6. THE COMBINED ROADWAY LOOP, TWISTED LEAD—IN WIRES, SPLICE, AND SHIELDED LEAD—IN CABLE SHOULD HAVE A RESISTANCE TO GROUND OF AT LEAST 50 TO 100 MEGOHMS. THE LOWEST ACCEPTABLE VALUE SHALL BE TEN MEGOHMS UNDER WORST CASE CONDITIONS.
- BEFORE STARTING ANY SPLICING THE ELECTRICAL CONTRACTOR SHALL FURNISH DATA SHEETS ON THE MATERIALS AND/OR METHODS TO BE USED IN ACCORDANCE WITH THE STANDARD OPERATING PROCEDURES FOR APPROVAL OF SHOP DRAWINGS.
- SPLICES ON LEAD-IN AND WIRE SHALL ONLY OCCUR IN THE ELECTRIC PULL BOX NEAREST TO WIRE LOOP SEGMENT.
- WIRE LOOP DETECTORS SHALL CONFORM TO THE REQUIREMENTS OF THE THE COMMONWEALTH OF MASSACHUSETTS HIGHWAY DEPARTMENT (MHD) STANDARD SPECIFICATIONS. SEE SPECIFICATION SECTION 01570 — TRAFFIC CONTROL.





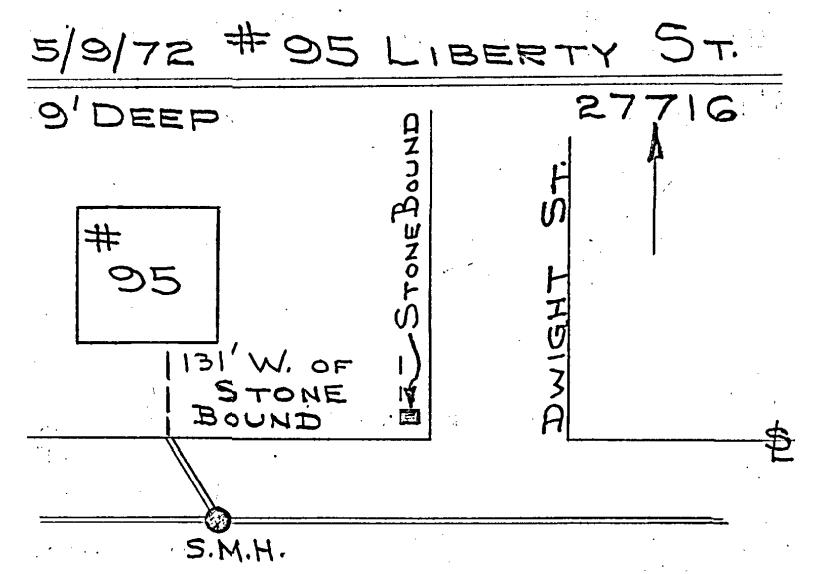
APPENDIX I
Sewer Lateral Cards (Liberty Street)



David Mc Lean 68-70 Liberty St. Hotel Belmont 12.5 13.0. 35.5

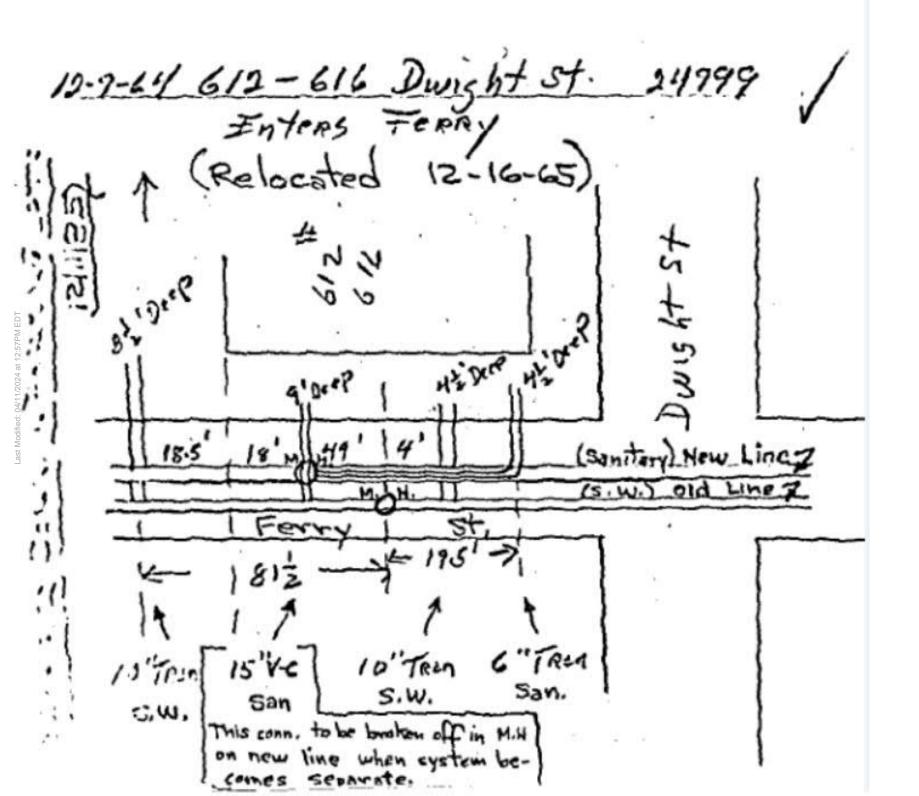
ast Modified: 04/11/2024 at 12:57PM ED

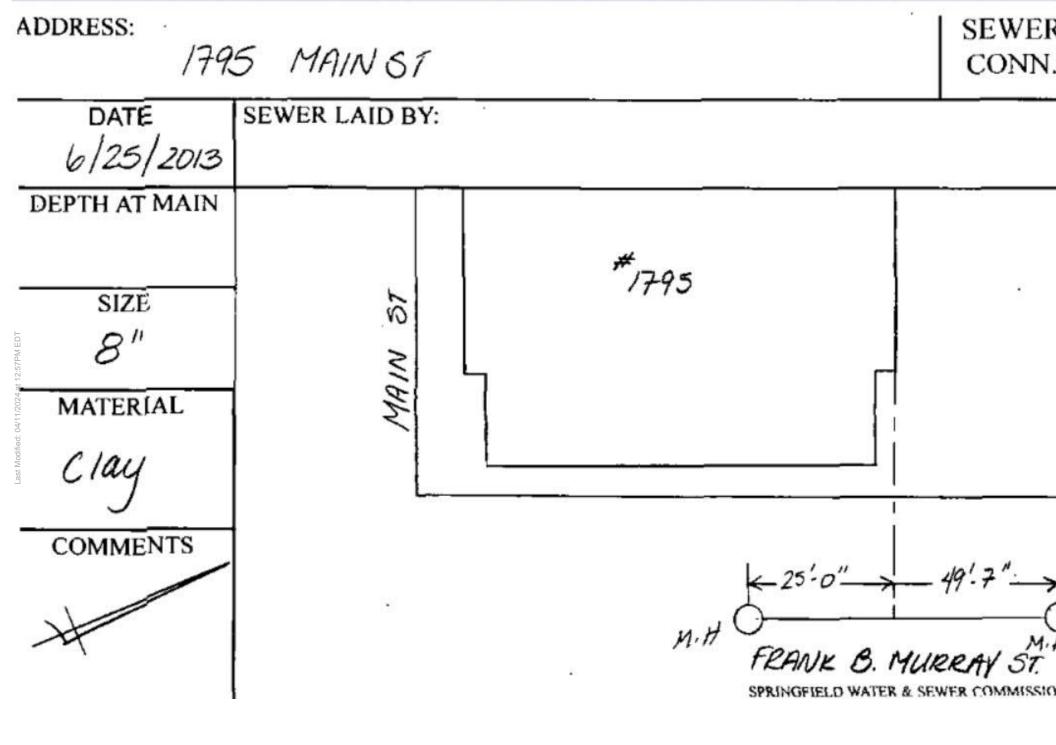
5/1/72 # 95 LIBERTY ST. 143.



FRANK B. MURRAY ST.

6 Connection for 25 Liberty Springfield Foundry Co Spring freld Founday Street line LIBERTY





6" Lomisection U. D 189 1 Mo Culey Estate Wow nomber = #1795 71.0

W.M. Young 147/2 Main St. (relaying)

Nov. 8, 1917

New number = \$1893 Main \$ 2,50 Congress St.

MAINIST FERRY to Consquess 1:55:

CONGRESS ST.

175		8-7-68
4/2024 at 12:57PM EDT	1+13'-> Post Office	Sturrt & HARRINGTON
Last Modified: 04/1	S'I DEEP S'I DEEP	21' N
S AW. M.	St25-0 m. H.	SW 81/2 DEEL
STORM	WATER SEWER	NEW M.H. T'DEEP

APPENDIX J Water Service Cards

Owner James Realty Corp.

s. R. 42353

Date
7-25-47
//15/48

Work Done

Service pipe laid by W.E.Mowrey

Dug up & repl. corp. a/c leaking at wedge & set classon box - M. O'Connor

Classon box in st. over 1" IK made onto 2"

Corp. 9'4" from S line of st., 12'0" E of W line of bldg, 36'10" W of E line of bldg, 12'9" E of E line of bldg. #51-57.

WATER DEPT., SPRINGFIELD, MASS

No. 73 LIBERTY ST. / DOMESTIC

Street

SPRINGFIELD

Owner Omar & Sons Furniture

S. R. 43137

Date	Wark Dane	
08/03/48	Service pipe laid by _{- R. HUNT}	
06/28/08	LOCATE SERVICE & NEW TIES – ENGR.	

- CLASSON BOX OVER 1" IK MADE ONTO 34" CORP
- 9'-11" N OF S LINE OF STREET
- 9'-11" N OF N LINE OF #73
- 10'-8" W OF E LINE OF #73
- 37'-9" NW FROM HYD #170

SPRINGFIELD WATER AND SEWER COMMISSION

Street SPRINKLER

Owner Omar & Sons Furniture

S.R.

Date	Wark Dane
09/27/48 02/15/50 06/28/08	Service pipe laid by - G. CORMIER SET 4" OS & Y GATE ON ST. SIDE OF METER - O'CONNOR LOCATE SERVICE & NEW TIES - ENGR.

- GATE BOX IN STREET OVER 4" B & F GATE #10548
- 9'-5" N OF S LINE OF STREET
- 9'-5" N OF S LINE OF BLDG #73
- 3'-1" W OF E LINE OF BLDG #73
- 30'-8" NW FROM HYD #170

SPRINGFIELD WATER AND SEWER COMMISSION

No. 80 CONGRESS STREET

Street

DOMESTIC

Owner MEDICAL PAVILLION

S. R. 710627

Date

7/17/71 7/19/71

Work Done

Service pipe laid by -SALVETTI

Replaced 4" BEND 5'0" long at bldg.a/c flaw in same causing leak - SALVETTI

GATE BOX IN STREET OVER 6" MJ GATE #8222 MADE TO 12x6 TEE

10'-5" SOUTH OF NORTH LINE OF STREET

50'-7" EAST OF WEST LINE OF BUILDING

119'-3" EAST OF EAST LINE OF BUILDING #60

73'-0" SOUTH WEST OF FIRE HYDT.

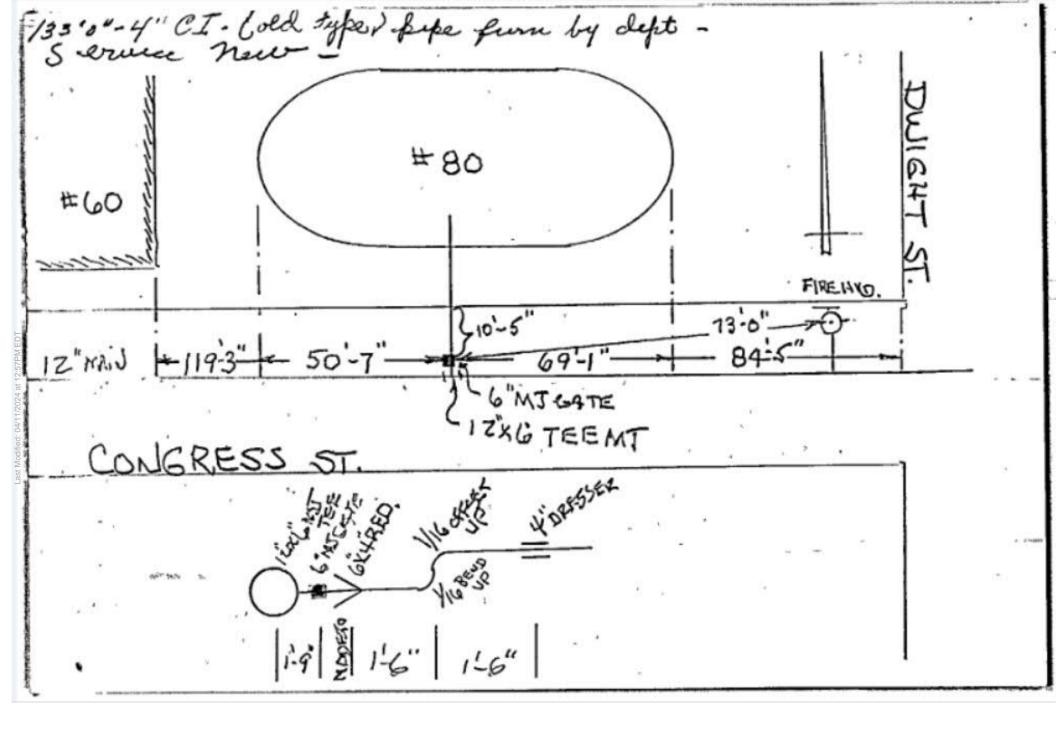
84'-5" WEST OF WEST LINE OF DWIGHT STREET

69'-1" WEST OF EAST LINE OF BUILDING

TIED INTO A NEW 12" WATER MAIN

12"x6"MJ TEE, 6"MJ GATE, 1/16BEND MADE TO 1/16BEND LOOKING UP
4"DRESSER 6"x4" REDUCER

10'-5" SOUTH OF NORTH LINE



No.	95	Lib	ert	y	
Owne	r T	ech	nic	olor	Inc.

Street Domestic Service S. R. 720111

and he sit with the first ord new block in the sit is the sit of	And the state of the control of the
Date	Work Done Jeft of
6-19-72	Service pipe laid by Salvetti
	[대한 경험도 이 및 경로 함께 이시도 한다니까 하는 시민보다는 [대] 도 하는 보고 하는 것이 말을 가능했습니다.
	[문화로] [문화 역시 문화문화 회사의 역사 기업 교육 기업 등록하다 하는 경기에 되었다. 그는 경험 문화 문화 등 경험
	[- 10 발생 - 12

Gate Box in st. over 4" B&F Mueller Gate # /630/
bolted to 8x4 Tapping sleeve 36'3" out from bldg, 40'8" E
of W line of bldg #95 Liberty St, 99'5" W of E line of
same, 24'6" W of W line of bldg #612 Dwight Street.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" L-856

No. 95 Liberty
Owner Technicolor, Inc.

Street Sprinkler Service

S. R. 720112

Date 6-19-72

Service pipe laid by Salvetti

Gate Box in st. over 8" B&F Mueller Gate # 16312

bolted to 8x8 Mueller sleeve 36'6" out from bldg, 46'2" E

of W line of bldg, 94'0" W of E line of bldg, 19'0" W of W

line of #612 Dwight Street.

Work Done

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" L-856

No. 125 Liberty Street MEDICAL CENTER Prinkler +

Dones No.

Owner Liberty Medical Bldg. Association S. R. 720439

Date
7-8-72 Service pipe laid by Salvetti

Gate Box in st. over 6" B&F (M&H) tapping gate

16334 bolted to 8x6 tapping sleeve 24'11" out from bldg, 113'7" W of E line of body of bldg, 38'3" E of W line of body of bldg.

WATER DEPT., SPRINGFIELD, MASS.

"YANDE" L-8565

MAY-25-1945- MOWREY 30'0"-11 Coment fined Pipe MINIMINI 22'0" 61:6"-4 B" MAIN C 3/4" Corp CHARLES

No. cor. Liberty & Chestnut Streets

Owner Registry of Motor Vehicles

S. R. 710133

Date	Work Done
6-2-71	Service pipe laid by Kennedy
9-4-71	Repaired 2" CT service pinched while digging to move hydt; replaced 4'0" of 2" CT; 2" CT dressers
1-23-78	21' & 24 out from gate box - Roncarati Repaired leak in parking lot; used 2' of 2" CT, etc.; 2-2" C-C conns. 19'0" out from hydrant - W.O. 94567)-Balboni

CONNECTION ON OLD CHARLES STREET

Gate Box in st. over 2" IK made onto $1\frac{1}{2}$ " Corp. 107' out from bldg, 31'4" N of S line of bldg, 50'4" S of N line of bldg, 135'7" S of S line of Liberty St.

WATER DEPT., SPRINGFIELD, MASS,

"YANDE" L-856

4. C. S. C. L. pipe furn, by Dept. CONGRE ELEC. ROOM UNDER FLOOR. S CLAMPS ON JOINTS, # 280 CHESTNUT ST. I.B.M. BLDG.

No. 280 Chestnut

Street Domestic & Sprinkler

Owner I.B.M. Office Bldg.

S. R. 700085

Date '

5-27-70

Service pipe laid by H. Roncarati

CONNECTION ON CONGRESS STREET

Work Done

Gate Box over 4" B&F Gate # 265/ made onto

12x12x4 tapping sleeve 15'10" S of N line of Congress St,

81'4" W of E line of bldg, 58'6" W of E line of retaining

wall, 3'4" W of W line of bldg.

WATER DEPT., SPRINGFIELD, MASS.

"YANDE" 1-8565

Owner Standard Photo Service, Inc.

s. R. 63910

ł	*	
	Date	Work Done
	11-10-64	Service pipe laid by J. Salvetti
	11-23-82	Leak on flange at footing - repaired same; W.O. 39779-Balb.
3 .		Relocated by J. Yacovone, Engineer (1999)
	5/15/95	Repaired leak w-2' of d.i.pipe; dressers located
	18'6" & 1	6'6" from gate #12197 WO#9511561 KNUREK CONNECTION ON LIBERTY STREET
	*	SA COMMECTION ON TENEVITY PERCENT

Gate Box in st. over 4" B&F Chapman Gate #12197, 18'6" N of S line of Liberty St, 3'0" E of W line of #612-616 Dwight St, 139'0" W of E line of same, 103'2" out from bldg, 29'9" NW from hydt #169.

WATER DEPT., SPRINGFIELD, MASS FORM 1208 5M 5-80

DOMESTIC SERVICE

Owner

S. R.

Date

9/18/2019 9/18/2019 Work Done

Service pipe laid by - TAP BY SWSC

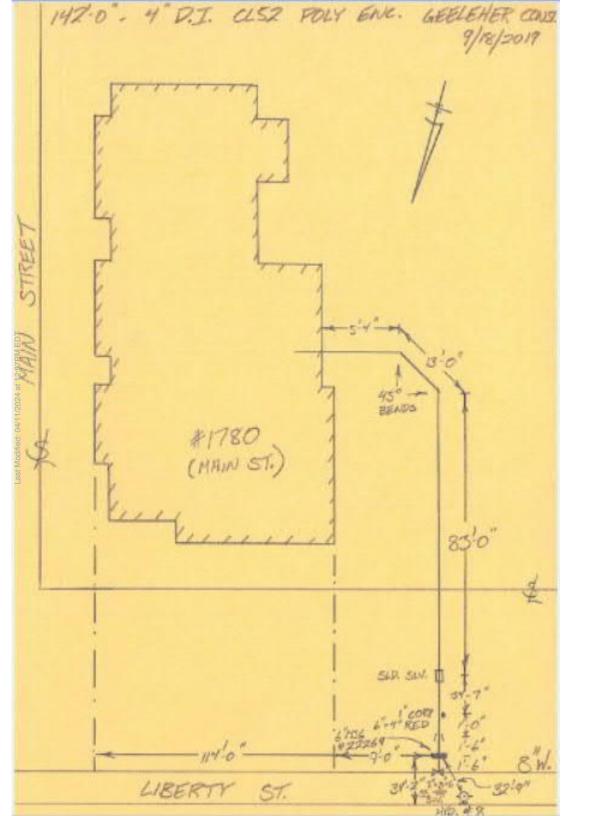
SERVICE LAID BY - GEELEHER CONSTRUCTION



CONNECTION ON LIBERTY STREET

GATE BOX IN STREET OVER 6" MJ GATE #22264

- 34'-2" S OF N LINE OF STREET
- 9'-0" W OF W LINE OF BLDG.
- 32'-9" SE OF HYD. #8
- 114'-0" W OF E LINE OF BLDG.



Owner James Realty Corp.

s. R. 42353

Date
7-25-47
//15/48

Work Done

Service pipe laid by W.E.Mowrey

Dug up & repl. corp. a/c leaking at wedge & set classon box - M. O'Connor

Classon box in st. over 1" IK made onto 2"

Corp. 9'4" from S line of st., 12'0" E of W line of bldg, 36'10" W of E line of bldg, 12'9" E of E line of bldg. #51-57.

WATER DEPT., SPRINGFIELD, MASS

No.--9=15 Erberty Owner - Hain & Cypress - Realty Co. s. r. 3712 & A Northarch Real-ty-Corp. Five Cent Savings Bank Spfld. Redevel. Auth. Date Work Done Service pipe laid by Laid 3" galv.pipe at st. line Parsons 10/23/28 LIBERTY St. #1437 4" Gate, 10'10" from S line of st., 12'3" W of E line of garage #15, 18'0" W of W line of #1796-1820 Main st. 71'6" E of E line of U. S. Envelope Co.

Street & 1810-1820 Main st.

WATER DEPT., SPRINGFIELD, MASS.

Garage 9-15. 510-10" 18:00 92-6" 4"Gate) CYPRESS ST

Air Condition No. 1743-1755 Main Street (additional supply) Owner Hetel-Charles-of-Springfield-Inc. S. R. 53995 16th Hotel Corp. Work Done Date: 7-28-55 | Service pipe laid by R. Hunt CATE Glasson box over 14" IK made onto 1" Corp. Tapped on opp. side of main 14'8" out from bldg., 85'7" S of N line of bldg., 49'6" N of S line of bldg., 27'7" NW of hydt #161.

"Y AND E" L-8565

STOP LOCATION

WATER DEPT., SPRINGFIELD, MASS.

No. 1795 Main Street SPRINKLER

Owner New North Dental Realty Trust

S. R. 680924

Date Work Done 2-01-69 Service pipe laid by Salvetti, to meter pit.

Gate Box in st. over 6" B&F tapping gate # 2924
made onto 16" x 6" tapping sleeve 32'0" out from bldg,
50'0" N of S line of bldg, 69'8" N of N line of Liberty
St, 8'3" SW of hydt #1984.

WATER DEPT., SPRINGFIELD, MASS.

'Y AND E' L-856

No. 1795 Main

Owner New North Dental Realty Trust:

S. R. 680897

Date:
2-01-69 Service pipe laid by Salvetti, to meter pit.

Gate Box in st. over 2" IK made onto $1\frac{1}{2}$ " Corp. 32'7" out from bldg, 48'10" N of S line of bldg, 67'8" N of N line of Liberty St, 10'3" SW of hydt #1984, 78'0" S of N line of bldg.

WATER DEPT., SPRINGFIELD, MASS.

"YANDE" L-856

No. 1757 MAIN STREET

Street

Owner

HOTEL CHARLES PARK

(Park Dept.)

s. R. 9730879

Date 10-17-97

Work Done

Service pipe laid by - N. Stalker

Buffalo Box in Park Lawn 11/4" I.K. with end cap on the Service of the Hotel Charles service which will also control this service 6" Gate #317. 21'6" S. of Gate #317 to 11/4" I.K. 16'0" N.W. of Electric Pole #01013 to Gate #317. 54'0" W. of W. line of Union Station Building. 153'0" E. of E. line of Main Street.

WATER DEPT., SPRINGFIELD, MASS. FORM 1208 5M 7-86

Owner Maxwell Realty Corp. S. R. 53444 Date Work Done re-5-18-55 Service pipe laid by C.H.Marhoffer CONNECTION ON RYAN COURT Gate box top over 14" IK made into 1" Corp. 7'5" from W line of st., 1'9" N of S line of bldg., 59'10" S of N line of bldg., 19'2" N of S line of #30-32 Ryan Court.

STOP LOCATION

Street

No. 1890-1900 Main

WATER DEPT., SPRINGFIELD, MASS.

MAY.18.1955. C.H.M. 28'0"-14 Loffer Juling #1890-1900 MAIN ST. REAR OF BUILDING E.ST.LINE 19'2" -> 4"CLMAIN. K Trcorp. RYAM ENTIRE W.ST.LINE #30=32

No. 20-50 Island Pond Road
Owner Gralia Construction

MENNEM Sprinkler Service

Work Done no meter set.

S. R. 760512

Date 12-2-76

Service pipe laid by Salvetti

Gate Box in st. over 8" B&F Met. Gate # 167/9 bolted to 8x8 tapping sleeve 183'6" out from bldg, 177'3" S of N line of bldg, 56'0" S of S line of #45 Island Pond Road, 31'3" E of W line of Island Pond Road.

No. 2735 Island Pond Road
Owner Gulf Oil Corp.

FRANKIE & DOWNES

Gas Station

S. R. 57150

Date	Work Done			
7-8-57	Service pipe laid by W.E.Mowrey			
	[발발 문화] 이 경험 전에 가는 이 사용을 받는 것이 되었다. 이 경험 전에 발표를 받는 것이 되었다는 것이 되었다. 그런 그런 그런 그런 것이 생각되었다. 그런 그런 그런 것이 되었다. [발표] 이 경험 전에 가는 경험 전에 가는 것이 되었다. 그런			
<u>.</u>				
NA.	[대고, 18] [18] [18] [18] [18] [18] [18] [18]			

Buffalo box in st. over 1" IK made onto 3/4" Corp. 38'll" from E line of st., 18'6" S of N line of bldg., 27'3" N of S line of bldg., 46'8" SW from hydt., 11"1" from W curb.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" . L-856

Street

DOMESTIC

S. R.000020

Date 7/20/02

Work Done

Service pipe laid by - MAIN TO BUILDING L. VANCINI

BUFFALO BOX IN STREET OVER 2" IK MADE ONTO A 11/2" CORP.

26'-0" WEST OF EAST LINE OF STREET

26'-2" NORTH OF SOUTH LINE OF BUILDING

131'-3" SOUTH OF NORTH LINE OF SAME

30'-3" SOUTHEAST FROM W.M.E.Co. POLE #4/3

WATER DEPT., SPRINGFIELD, MASS. FORM 1208 5M 2-91

Street

SPRINKLER

S. R. 000021

The state of the state of

Date

7/20/02

Work Done

Service pipe laid by - MAIN TO BUILDING - L. VANCINI

GATE BOX IN STREET OVER 6" TAP MJ GATE #18239

- 25!-6! WEST OF EAST LINESOF STREET

23'-5" NORTH OF SOUTH LINE OF BUILDING

134'-0" SOUTH OF NORTH LINE OF SAME

31'-7" SOUTH EAST FROM W.M.E.Co. POLE #4/3

WATER DEPT., SPRINGFIELD, MASS. FORM 1208 5M 2-91

Street SPRINGFIELD

Owner

David & Chris Fiske

Ś. R. 770440

Date

09/15/77 07/22/09 **Work Dane**

Service pipe laid by - BALBONI CONNECT TO NEW 8" MAIN - JACK GONCALVES



CONNECTION ON ARDEN ST.

BUFFALO BOX IN TREEBELT OVER 1" IK

- 7'-4" N OF S LINE OF STREET
- 22'-9" W OF E LINE OF MAIN BODY OF HOUSE # 61
- 3'-7" E OF W LINE OF MAIN BODY OF HOUSE # 61
- 34'-0" N OF N LINE OF HOUSE # 61
- 49'-8" W OF W LINE OF MAIN BODY OF HOUSE # 11 ARDEN ST. ANOTHER BUFFALO BOX IN STREET OVER 1" IK MADE ONTO 1" CORP OPEN & BURIED 13'-0" N OF IK IN TREEBELT

FRINCFIELD WATER AND SEWER COMMISSION-

No. 75 ISLAND POND RD.

Street SPRINGFIELD

Owner Kennith

Kennith & Kella Rolon

s. R. 800224

Date 9/20/80

09/20/80 07/22/09

Work Dane

Service pipe laid by - BALBONI CONNECT TO NEW 8" MAIN - JACK GONCALVES



CONNECTION ON ARDEN ST.

BUFFALO BOX IN TREEBELT OVER 1" IK

- 8'-3" S OF N LINE OF STREET
- 4'-0" W OF E LINE OF MAIN BODY OF HOUSE # 75
- 20'-0" E OF W LINE OF MAIN BODY OF HOUSE # 75
- 34'-8" S OF S LINE OF HOUSE # 75
- 64'-0" W OF W LINE OF GARAGE OF # 30 ARDEN ST.

ANOTHER BUFFALO BOX IN STREET OVER 1" IK MADE ONTO 1" CORP OPEN & BURIED 26'-0" S OF IK IN TREEBELT

FROTS

SPRINGFIELD WATER AND SEWER COMMISSION

No. 78 Island Pond Road

Street

Owner Swett Realty Co.

MURPHYS POP SHOP

s. R. 43594

Date

11-15-48

Work Done

Service pipe laid by M.J. Shaughnessy Replaced classon cover a/c resurfacing - Brown

Classon box in st, over i" IK made onto 3" Corp. 27'6" W of E line of st, 61'7" N of S line of bldg, on N line of bldg, 81'll" N of N line of #70

WATER DEPT., SPRINGFIELD, MASS.

No. 81 Island Pond Road

-Street

LOT #72

Owner Rose O'Neil

S. R. 8731574

Date

10-22-87

re- Work Done
Service pipe laid by - Buoniconti

Buffalo Box in Street over 1" IK made onto 3/4" Corp, 50'6" out from house, 13'6" N of S line of house, 16'9" S of N line of house, 48'3" N of N line of house #75.

WATER DEPT., SPRINGFIELD, MASS. FORM 1208 5M 7-86

No. 87 Island Pond Road

Street

Owner Lisa Bradlyn

S. R. 8636399

Date re- Work Done
9-25-86 Service pipe laid by Scibelli

Buffalo Box in st. over 1" IK made close to 3/4" Corp.
TAPPED ON TOP, 51'2" out from house, 24'5" N of S line of house,
5'10" S of N line of house, 35'8" S of S line of #93.

WATER DEPT., SPRINGFIELD, MASS FORM 1208 5M 5-80

Street

S. R. 53052

Date

Work Done

3-31-55 Service pipe laid by R. Hunt

Classon box over 1" IK 1'2" above 3/4" Corp. Tapped on top. 27'3" W of E line of st., 40'3" S of N line of bldg. 9'7" N of S line of bldg., 27'3" N of N line of #78.

No. 93 Island Pond Road

Street

Work Done

Owner Joseph Accetta

S. R. 840349

Date re-9-10-84 Service pipe laid by - E. Cote

Buffalo Box in St. over 1" IK made onto 3/4" Corp, 51'3" out from house, 5'8" N of S line of house, 24'7" S of N line of house, 53'7" S of S line of house #99.

WATER DEPT., SPRINGFIELD, MASS FORM 1208 5M 5-80

No. 94 Island Pond Rd. -Street - CAR WASH

Owner Bradley Auto Wash & Sales

S. R.700236

Left off at IK

Date 🛴 6-8-70

Service pipe laid by Cunningham

Gate Box in st. over 2" IK made onto 12" Corp.

TAPPED ON TOP 27'0" W of E line of st, 24'0" S of N line of bldg, 49'6" N of S line of bldg, 28'8" SE of Electric Pole #9.

No. 99 Island Pond Road-

XXXXXXXX

Owner Raymond J. & Josephine A. Bisi

S. R. 800408

Buffalo Box in st. over 1" IK made onto 3/4" Corp. 51'1" out from house, 23'11" N of S line of house, 6'3" S of N line of house, 38'7" S of S line of house #105, 25'6" W of E line of st.

WATER DEPT., SPRINGFIELD, MASS.

FORM 1208 5M-11-70

"YANDE" L-8565

Mb. 105 ISLAND POND RD.

Street SPRINGFIELD

Cana

Robert & Rhonda Lagasse

S. R. 8605617

Date 12/19/86 07/16/09

Work Done

Service pipe laid by - BUONICONTI CONNECT TO NEW 8" MAIN - JACK GONCALVES



CONNECTION ON ARDEN ST.

BUFFALO BOX IN TREEBELT OVER 1" IK

- 7'-6" N OF S LINE OF STREET
- 16'-3" W OF E LINE OF MAIN BODY OF HOUSE # 105
- 6'-0" E OF W LINE OF MAIN BODY OF HOUSE # 105
- 36'-9" N OF N LINE OF HOUSE # 105
 ANOTHER BUFFALO BOX IN STREET OVER 1" IK MADE ONTO 1" CORP
 OPEN & BURIED 25'-0" N OF IK IN TREEBELT

Last Modified: 04/11/20

No. 110 Island Pond Road

XXXXXX SPRINKLER SERVICE

Owner Keystone Enterprises

S. R. 770037

Date
5-06-77 Service pipe laid by Salvetti

Work Done Meter not part

Salvetti

Gate Box in st. over 6" B&F Mueller gate # 5/94 bolted to 8x6 tapping sleeve 14'5" S of S line of body of #105 Island Pond Road, 45'3" S of N line of #105, 17'6" N of N line of #99 Island Pond Road, 32'0" E of W line of Island Pond Road.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" L-856

Street SPRINGFIELD

OBSTER.

Rite Aid Corp.

S. R.

Derive

09/23/55 10/24/55

05/11/10

Work Done

Service pipe laid by - D. METCALFE RAISED GATE BOX A/C CONST – L. E. BARNEY DRAWN IN FIELD

GATE BOX IN STREET OVER 2" PL BRASS VALVE

- 1'-0" FROM 1 1/2" CORP
- 32'-0" N OF N LINE OF # 121
- 27'-6" W OF E LINE OF ISLAND POND RD.
- 60'-8" N OF S LINE OF # 121
- 76'-8" NW OF HYD # 1952

Ogner

Long Kim Le

s. R. 8832361

Deite

12/03/88 07/16/09 Work Dane

Service pipe laid by - SCIBELLI CONNECT TO NEW 8" MAIN - JACK GONCALVES



CONNECTION ON ARDEN ST.

BUFFALO BOX IN TREEBELT OVER 1" IK

- 7'-3" S OF N LINE OF STREET
- 1'-8" W OF E LINE OF MAIN BODY OF HOUSE # 121
- 22'-7" E OF W LINE OF MAIN BODY OF HOUSE # 121
- 30'-0" S OF S LINE OF HOUSE # 121
- 6'-5" E OF W LINE OF HOUSE # 105 ISLAND POND RD.

ANOTHER BUFFALO BOX IN STREET OVER 1" IK MADE ONTO 1" CORP OPEN & BURIED 10'-6" S OF IK IN TREEBELT

SPEEDLEVIRLD WATER AND SEWER COMMISSION

No. 126 ISLAND POND ROAD

itreet

(MAXI DRUG)

Domostic

Owner MAXI DRUG

SPRINKLER

Date
Service pipe laid by

GATE BOX IN STREET OVER 2½" PL BRASS VALVE

31'-6" E OF W LINE OF STREET, 105 S OF N LINE OF BLDG.

78'-10" S OF S LINE OF #141 110'-0" S OF N LINE OF

SAME 27'-0" SE FROM W.M.E.CO POLE #13 (8" SPRINKLER 3'

0" NORTH)

WATER DEPT., SPRINGFIELD, MASS. FORM 1208 5M 2-91

No. 126 ISLAND POND RD

Street

Work Done

Owner MAXI DRUG

Date

Service pipe laid by

29 NOV 2011

REPAIRED OFFSET - W. BrAWT (SWSC)

29'-0" Whor E LINE OF STREET, 102'-0" S OF N LINE OF BLDG. (MAXI-DRUG) 75'-10" S OF S LINE OF #141, 107'-0" S OF N LINE OF SAME, 25'-0" SE FROM W.M.E.CO. POLE #13 (1½"" domestic 3'-0" SOUTH)

WATER DEPT., SPRINGFIELD, MASS. FORM 1208 5M 2-91

No. 141 Island Pond Rd

Street Lot 66

Work Done

Owner Allan Sponburgh

S. R. 8520460

Date 2-14-86

re-Service pipe laid by Demers

Buffalo Box in st. over 1" IK made onto 3/4" Corp, 52'0" out from house, 11'3" S of N line of house, 19'2" N of S line of house. NOTE:- NEED 8'0" KEY TO OPERATE IK.

WATER DEPT., SPRINGFIELD, MASS FORM 1208 5M 5-80

No. 157 Island Pond Rd.

Street

Owner James Tilden

S. R. 8831167

Date 6-27-88

re- Work Done
Service pipe laid by - Scibelli

Buffalo Box in St. over 1" IK made onto 3/4" Corp, 49'2" out from house, 12'2" S of S line of house, 36'6" S of N line of house, 74'6" N of N line of house #141's Garage, 27'4" W of E Street

Line.
WATER DEPT., SPRINGFIELD, MASS.
FORM 1208 5M 7-86

Service Station

S. R. 54532

No. 158 Island Pond Road

Owner Duncan Construction Co. Inc.

Date 10-27-55

Work Done

Service pipe laid by J.P. Sullivan & conn. to C.T. laid by owner.

Street

Classon box over 1" IK connected to 3/4" Corp. 29'0" W of E line of st., 17'0" N of N line of #158, 49'8" N of S line of #158, 31'9" N of N line of #141, 52'7" N of N line of body of #141.

WATER DEPT., SPRINGFIELD, MASS.

"YANDE" L-8565

No. 160 Kimberly
Owner Joseph C. Carlson

Street

S. R. 61883

Date re- Work Done
10-31-61 Service pipe laid by C. Turcotte

Buffalo box in st over 1" IK made onto 3/4" Corp.
18'7" from E line of st., 3'2" S of N line of house,
31'2" N of S line of body of house, 13'2" S of S line of house #166.

WATER DEPT., SPRINGFIELD, MASS.

"YANDE" L-8565

No. 163 Kimberly Avenue Owner Thomas L. Gieschi Street

S. R. 750072

3-20-75 Service pipe laid by _J.Balboni

Work Done

Service pipe laid by _J.Balboni

Buffalo box in street over 1" IK made onto 3/4" corp., 42'11" out from house, 7'2" S of N line of house, 22'5" N of S line of house, 59'10" S of S line of house #155, 17'4" from E line of st.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" L-85

No. 165 Island Pond Road
Owner Richard E. Therrien

Street

S. R. 690888

Date Work Done 10-31-69 Service pipe laid by Cunningham

Buffalo Box in st. over 1" IK made onto 3/4" Corp. 28'0" W of E line of st, 5'2" S of N line of house, 35'0" N of S line of house, 62'11" N of N line of #157.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" L-856

No. 166 Kimberly Ave.

- Street

Owner Dr. Edward L. Klein

s. R. 8504474

Date 12-12-85

re- Work Done
Service pipe laid by - Buoniconti



CONNECTION ON ALLEN STREET

Buffalo Box in St. over 1" IK made onto 3/4"

Corp, 18'6" from N line of St., 12'10" E of E line

of body of house, 39'10" E of W line of body of house,

14'0" W of W line of Kimberly Ave. WATER DEPT., SPRINGFIELD, MASS

STOP LOCATION

FORM 1208 5M 5-80

No. 178 ISLAND POND RD.

Street SPI

SPRINGFIELD

S. R.

Owner

Date		Work Done	
	Service pipe laid by		
09-11-1926	TAPPED	- A. L. FLETCHER	
02-08-2022	MAIN TO HOUSE	- R. RAMOS	

- BUFFALO BOX IN TREEBELT OVER 1"IK
- 8'-0" E OF W STREETLINE
- 2'-0" S OF N LINE OF HOUSE
- 33'-0" N OF S LINE OF HOUSE
- 86'-0" S OF S LINE OF ROSELLA ST.
- ANOTHER BUFFALO BOX OPEN AND BURIED OVER 1"IK/ 3/4" CORP 25'-0" E OF BUFFALO BOX IN TREEBELT

No. 185 Island Pond Road

Owner Berard & Sons Denis-L.-& Amanda Berard S.R. 50970

Berard & Sons Inc.

Samuel L. Lieberman

Date

12-15-53 Service pipe laid by F.C. Moore

Classon box over 1" IK made onto 3/4" Corp.

58'3" from N.W. corner of foundation, 26'8" N of N
line of foundation, 6'9" S of N line of Rosella St.,

21'2" S of S line of #194, 35'10" E of W line of
Island Pond Road. Pipe enters bldg., 2'0" E of NW
corner.

WATER DEPT., SPRINGFIELD, MASS.

No. 194 Island Pond Road

Street

Lot #A

Owner Frederick E. Mack

S. R. 48987

Date
4-18-52 Service pipe laid by D. Metcalfe

CONNECTION ON ROSELLA ST.

Classon box in st. over 1" IK made onto \(\frac{3}{4}\)" Corp. 31'10"

S of S line of house, 24'0" W of E line of body of house,

1'0" E of W line of body of house, 51'6" W of W line of
Island Pond Road S.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" L-856

Street

Lot #A

Owner -Frederick-E -- Wack John J & Carmela L. McCarthy

S. R. 48087

Date Work Done 4-18-52 Service pipe laid by D. Metcalfe

CONNECTION ON ROSELLA ST.

Classon box in st. over 1" IK made onto \(\frac{3}{4}\)" Corp. 31'10"

S of S line of house, 24'0" W of E line of body of house,

1'0" E of W line ofbody of house, 51'6" W of W line of

Island Pond Road S.

WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" . L-8565

No. 200 Island Pond Road Street Lot #B

Owner Frederick-E.-Mack-Walter J & Jane Oleskiewicz s. R. 48086

Date
4-22-52 Service pipe laid by D. Metcalfe

Classon box in st. over 1" IK made onto $\frac{3}{4}$ " Corp. 61'6" E of E line of body of house, 5'0" S of N line of body of house, 27'2" N of S line of house, 74'6" N of N line of body of #194,

No. 208 Island Pond Road

Street

Lot #C

Owner Frederick E. Mack Edward & Nora Anne Guczek

S. R. 48085

Date 2-20-52 Service pipe laid by D. Metcalfe

Classon box in st. over 1" IK made onto $\frac{3}{4}$ " Corp. 61'2" out from body of house, 20'2" N of S line of house, 11'2" S of N line of body of house, 82'0" S of S line of body of #218.

No. 209 Island Pond Road

Lot 41. -Street-

Owner Berard-&-Sens-Renzo Paschetto & Lillian S. R. 52175

Date 9-2-54

Work Done

-2-54 Service pipe laid by C.H. Marhoffer 7-20-63*Replaced classon cover a/c resurfacing - Brown

Classon box in st. over 1" IK made into 3" Corp. 49'2" out from house, 13'11" N of S line of house, 20'7" S of N line of house, 2'll" S of S line of #208 Island Pond Road.

* note: part of old cover is in box but IK can be operated (Brown).

WATER DEPT., SPRINGFIELD, MASS.

Street

Owner Berard & Sons

S. R. 52176

Art-hur-We-& -Bernico-E--Hill

Armand Giustina

Date

Work Done Left off when laid 12-17-54 Service pipe laid by C.H. Marhoffer

Classon box in st. over 1" IK made into 3/4" Corp. 52'5" from body of house, 9'3" S of N line of house, 23'9" N of S line of house, 65'3" N of N line of #209.

WATER DEPT., SPRINGFIELD, MASS.

218 Island Pond Road Street

Owner Margaret-I.-Low

No.

s. R. 36910

Date

Oute

6-17-38 Service pipe laid by W.E.Mowrey, separation of supply
10/5/38 Used 0'6"-\frac{3}{4}" copper tubing & copper cplgs to raise pipe over sewer 17' from corp. - Metcalfe
4/27/39 Raised classon box to grade - Hunt
8-19-88 Cleaned Service on W.O.#8815875 - Barnes God Flow)

Classon box in st over 3/4" I.K. near 3/4"Corp

56'6" E of E line of house, 6'10" N of N line of house,

- 36'6" N of S line of chimney, 6'10" S of S line of

chimney #224, 53'0" N of N line of Gertrude St.

4-11-98 REPAIRED BROKEN I.K. PAUEMENT MANAGEMENT STOWES WATER DEPT., SPRINGFIELD, MASS.

"Y AND E" SPRINGFIELD & ROCHESTER, N. Y. 6M 11-32 1449 B 2

Street

Owner Berard & Sons James D. Roy -William -A. & - Dorot-by C. - Senecal

s. R. 52177

Date 4-11-98

Work Done feet off prhen land 12-16-54 Service pipe laid by C.H.Marhoffer

REPAIRED BROKEN I"I.K. PAVEMENT MANAGEMENT S. JONES

Classon box in st. over 1" IK made into 3/4" Corp. 50'6" from body of house, 21'00" S of N line of house, 9'2" N of S line of house, 14'0" N of N line of #218.

WATER DEPT., SPRINGFIELD, MASS.

STOP LOCATION

No. 224 Island Pond Road
Owner Thomas R. Kakley

S. R. 820259

Date 8-12-82

Work Done

Service pipe Taid by F. Scibelli:

Buffalo Box in st. over 1" IK made onto 3/4" Corp.. 51'10" out from piazza, 5'6" S of N line of house, 23'8" N of S line of chimney, 37'0" N of N line of house #218, 36'0" E of W street line.

WATER DEPT., SPRINGFIELD, MASS FORM 1208 5M 5-80 STOP LOCATION

No. 232	Island Pond Road Sheet	
Owner Lou	is-JMerceline S. R. 54128	
Geo. W.F	labienne Whitford	
Date	Work Done	
10-7-55	Service pipe laid by C.H.Marhoffer	
11/13/200	O Brown leak on service	

Classon box in st. over 1" IK made into 3/4" Corp. 68'9" out from house, 20'10" S of N line of house, 35'0" N of S line of garage, 2'0" N of S line of #233.

WATER DEPT., SPRINGFIELD, MASS.

1st & TO C @27'10"

"Y AND E" L-856

STOP LOCATION

DW CTO C 28'1"

Lot 44

No. 233 Island Pond Road

Street

Owner Berard & Sons

s. R. 52178

Gusto P. & Eileen F. Tomassetti

Date

Work Done Jest of gentien cont

4-11-98

12-16-54 Service pipe laid by C.H. Marhoffer

REPAIRED BROKEN I'L.K. PAUEMENT MANAGEMENT. SJONES

Classon box in st. over 1" IK made into 3/4" Corp. 65'0" from body of house, 12'4" N of S line of house, 20'0" S of N line of house, 82'0" N of N line of #224.

WATER DEPT., SPRINGFIELD, MASS.

STOP LOCATION

APPENDIX K Valve Operation Sequence

Restored Services Areas Addresses and Owners

Address Ov	
Audicss IOV	wner
144-146 Massachusetts Ave Jac	cqueline M. Thomas
	rol G Green
21 Westford Circle La	mar Wright
Restored Services Area 2	
Address Ov	wner
45-49 Westford Circle Pa	itricia J and Allan B Williams
46-48 Westford Circle De	ermont and Joycelyn Meredith
52-54 Westford Circle Jar	mes B Jr. Morrissey and John Swift Trustees
•	
Restored Services Area 3	
Address Ov	wner
62-64 Westford Circle Eva	an and Marcia M James
68-70 Westford Circle An	na Y. Mejia
72-74 Westford Circle Joe	ese L Alvarado
78 Westford Circle All	lizandria M. Nieves
67-69 Westford Circle Ma	aria G and Helena Kos and Roman Skvarnavicius Beraski
71 Westford Circle Da	amon A Bermudez
Restored Services Area 4	
Address Ov	wner
100 Westford Circle Sa	ıllie D Williams
102-104 Westford Circle Mid	chael A Acevedo
99 Westford Circle Ca	arol Tr Thorington
103 Westford Circle The	eresa Nelson Jacobs Ida
Restored Services Area 5	
Address Ov	wner
115 Westford Circle Ste	ephen Rice
117-119 Westford Circle Ke	enneth Douglas
129 Westford Circle Mid	chael T Power
134-136 Westford Circle Wo	olsley P and Trevor C Crichlow
128-130 Westford Circle Ch	nantanique L Powell
124-126 Westford Circle On	nota Rental LLC
118-120 Westford Circle Lit	ttle Eagle LLC
114-116 Westford Circle Mil	ldred P Waddell

Restored Services Area 6	
Address	Owner
114-146 Westford Circle	Othniel Agabert and Elaine Patricia Davey
152-154 Westford Circle	Sun Properties LLC
158-160 Westford Circle	Ivin and Charlesetta Smith Rennix
145 Westford Circle	Beatryce H and Scott Alice D Crocker
149-151 Westford Circle	Junior A and Donna Reid
155-157 Westford Circle	Merceline S Watson
161 Westford Circle	Essie M Ware
Restored Services Area 7	
Address	Owner
170 Westford Circle	Copenger LLC
174 Westford Circle	Emmanuel Tanco Verdejo
180 Westford Circle	Junior C and Marie E Martin
184-186 Westford Circle	Maria Maysonet
181 Westford Circle	Sherlock P Suban
185-187 Westford Circle	Norma H Moore
191-189 Westford Circle	Richard Rodriguez
Restored Services Area 8	
Address	Owner
192-194 Westford Circle	Tannesa Suban
202 Westford Circle	Value Properties LLC
206-208 Westford Circle	Orland and Dorrel M Williams
195 Westford Circle	Carla R and Rufus J III Kynard

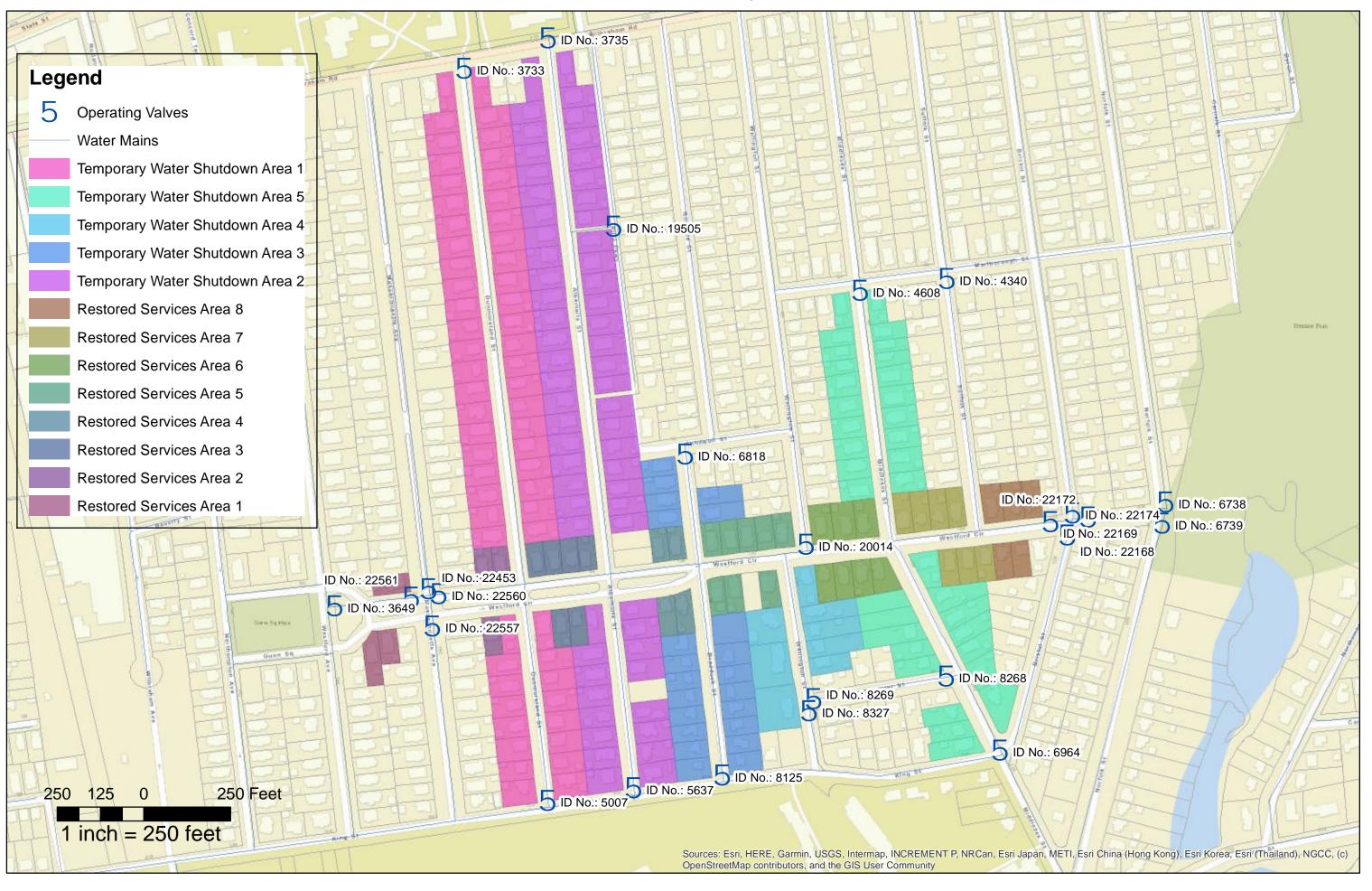
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Temporary Water Shutdown Area	
Address	Owner
136-138 Dunmoreland Street	Brunildo H Jr. and Mrecedes L Nunez
130 Dunmoreland Street	Meggan M Watson
124-126 Dunmoreland Street	Meggan M Watson
116-118 Dunmoreland Street	Derrik G Meade
110-112 Dunmoreland Street	Frank L and Marilyn Norman
104-106 Dunmoreland Street	Jiijo Ali
98-100 Dunmoreland Street	Zebertee W Jones
92-94 Dunmoreland Street	Joseph B Herbert
88 Dunmoreland Street	Charity P Steptoe
82 Dunmoreland Street	James F and Sylvia J Evans
76 Dunmoreland Street	William H and Georgiana Jones
68-70 Dunmoreland Street	Thomas IDA L TR
62-64 Dunmoreland Street	Fronk Ofori Boateng
56-58 Dunmoreland Street	Beverly Bromfield
50-52 Dunmoreland Street	Kevin Malone
44-46 Dunmoreland Street	Piomeer Housing LLC
38-40 Dunmoreland Street	Sammy D and Sharon J Harris
32-34 Dunmoreland Street	32-34 Dunmoreland St LLC
26-28 Dunmoreland Street	Pamela Ferguson
20-22 Dunmoreland Street	Enrique J Nieves
16-18 Dunmoreland Street	Veronica D Smith
17-15 Dunmoreland Street	William N and Dawn M Clarke
19-21 Dunmoreland Street	Vernon D Welch
25 Dunmoreland Street	Yvonne Hill
31-33 Dunmoreland Street	Perry Morris and King Robin
37-39 Dunmoreland Street	George and Petra Greaves
45-43 Dunmoreland Street	Henry Meredith
51-49 Dunmoreland Street	BH EHT 2 LLC
63-61 Dunmoreland Street	Errol G Wilson
67-69 Dunmoreland Street	Gwendolyn I Wilson
75-77 Dunmoreland Street	Estanislao Jimenez
81 Dunmoreland Street	Aldon and Juliet Sewell
89 Dunmoreland Street	Jan M Washington
91 Dunmoreland Street	Evins C and Bernice Brantley
99 Dunmoreland Street	King E and Elizabeth W Dood
103 Dunmoreland Street	The Seajay Group LLC
109-111 Dunmoreland Street	Jose Monteiro Luss
115-117 Dunmoreland Street	Jessica Johnson
123 Dunmoreland Street	Michael Coleman
129 Dunmoreland Street	Karon E Tyler
133-135 Dunmoreland Street	Keith R Sheppard
172-174 Dunmoreland Street	Marcia M James
178-180 Dunmoreland Street	Ralph K and Ilene E Brathwaite
184 Dunmoreland Street	Courageous Lion LLC
192 Dunmoreland Street	Jesse J and Abigail Kyles
196 Dunmoreland Street	Buford and Emurriel H Trustees
202 Dunmoreland Street	Alexander Gonzales
208 Dunmoreland Street	Terekah Thaxton
207-209 Dunmoreland Street	Pauline A Goodchild
201 Dunmoreland Street	Rozelynn E Douglas
195 Dunmoreland Street	Yvette E and May V Hay
189 Dunmoreland Street	Mufutau and Sandra Agboola
183-185 Dunmoreland Street	Aldaine Murray
179 Dunmoreland Street	Jose L and Olguita Soto
171 Dunmoreland Street	Nydia Abrante Aviles

Temporary Water Shutdown Area	12
Address	Owner
210 Albemarle Street	Value Properties LLC
204-206 Albemarle Street	Andrea Bennefield
196-198 Albemarle Street	Anne and Robin L Roberts
192 Albemarle Street	Irma N Foster
184-186 Albemarle Street	Willie Jr TR and Ethel E TR Jones
178-180 Albemarle Street	Willie Jr TR and Ethel E TR Jones
172-174 Albemarle Street 77 Westford Circle	Henry Oliver Ruth Ann Hamilton
161 Albemarle Street	Juan J and Sandra I Roland
167-169 Albemarle Street	Janet Maxin Goffe
173 Albemarle Street 179 Albemarle Street	Johanee Theodat
	Amanda Lee Candlelaria
191 Albemarle Street	Donovan and Lyz D Hugget
197 Albemarle Street	Josephine Mcniel
203 Albemarle Street	Nathon and Charlotte A Wilkerson
209 Albemarle Street	Jose L and Luis Torres
136 Albemarle Street	Yvonne C Perry
130 Albemarly Street	Barbard D and Alaina R and Robert Brown
124 Albemarle Street	Sheryl Pace-Webb
118-120 Albemarle Street	Michele Byers and Clark Lisa Byers
114 Albemarle Street	Wanda F and Nigel A Thomas
106-108 Albemarle Street	Earlie Dudley Burns
100-102 Albemarle Street	CTL Realty LLC
94-96 Albemarle Street	Annie M and Jessie L Howard
88-90 Albemarle Street	Donald E and Geraldine T Johnson
82-84 Albemarle Street	Ricardo Medero
76-78 Albemarle Street	Waltiko Q Fludd
70-72 Albemarle Street	Olga Krismeli Perozo
64-66 Albemarle Street	Harold Moultrie
58-60 Albemarle Street	Lilian Wonita Miller TR
52 Albemarle Street	Leon and Shirley Lowe Blake
46-48 Albemarle Street	Elvis E Olivares Vasques
40-42 Albemarle Street	Jada L Miller
34-36 Albemarle Street	Lorenzo M D Jur and Kathleen Trustees
28-30 Albemarle Street	Richard V and Soni E Pantoja Almodovar Ramos
22-24 Albemarle Street	Arlington Ducanson
16 Albemarle Street	Winston J Fracis
211 Wilbraham Road	Louis Javie Cabreja-Hidalgo
211-223 Wilbraham Road	Dannys Solis
11 Albemarle Street	Marica C Rodriques
19 Albemarle Street	Felix Almonte
25-27 Albemarle Street	Frank L and Pamel R Woodfine
31-33 Albemarle Street	Pauline Barrett
37-39 Albemarle Street	Hilda L Davis
41-43 Albemarle Street	Vincent A Simpson and Vent M Brown-Simpson and Mscino V Simpson
49 Albemarle Street	Tyrah R and Aaron Pope Brown
53-55 Albemarle Street	Crescencio E Martinez
61 Albemarle Street	Delno E Clark
67 Albemarle Street	Leroy Martin
73-75 Albemarle Street	Tasha Johnson
79 Albemarle Street	Gilbert B Johnson
85-87 Albemarle Street	Alexander Dixon
91-93 Albemarle Street	Miguel A an dRosa I Matias Rios
97 Albemarle Street	Donald E Jr. and Patrick J Johnson
103-105 Albemarle Street	BH EHT 2 LLC
115 Albemarle Street	Jaime and Zoraida Sanches Mangual
121 Albemarle Street	Ibraham Khalid
125 Albemarle Street	William Melendez
127 Albemarle Street	William Melendez
131 Albemarle Street	Gwendolyn Lewes
135-137 Albemarle Street	The Seajay Group LLC

Temporary Water Shutdown Area 3			
Address	Owner		
54 Braddock Street	Darrell Nichols and Keith Jubrey		
60 Braddock Street	Stephe Eaton		
66 Braddock Street	Dennis L Obrien		
70 Braddock Street	Phyllis E Goodman		
76 Braddock Street	Annie C Phillips		
80 Braddock Street	Jimarri J Scott		
86 Braddock Street	Frederick and Caolyn A Guess		
90 Braddock Street	Latoya T Donawa		
91 Braddock Street	Brendan C McCarthy		
85 Braddock Street	Nadine Pallazola		
81 Braddock Street	Jose A Lopez		
75 Braddock Street	Robin Williams		
71 Braddock Street	Callaghan Holding LLC		
65 Braddock Street	Paralee O Thomas		
61 Braddock Street	Charles E and Deborah S Scott		
51 Braddock Street	Xavier Martin		
18-20 Braddock Street	Joshua M Glicksman		
14-16 Braddock Street	Mamie Banks		
8-10 Braddock Street	Cherise Ellis		
4-6 Braddock Street	Virgina Caez		
11-15 Braddock Street	Brendaliz Nernandez		
17-19 Braddock Street	Yellowbrick Property LLC		
Temporary Water Shutdown Area	4		
Address	Owner		
174 Wellington Street	Bobby and Christine Hartsfield		
184 Wellington Street	Angenette Smith		
200 Wellington Street	Else M Heard		
159 Wellington Street	Lawson A and Burnella H Walters		
165-167 Wellington Street	Mayes Insurance Company		
177 Wellington Street	Graduate Housing		
181 Wellington Street	Value Properties LLC		
185 Wellington Street	Evalyn McKenzie		
_			

Temporary Water Shutdown Area 5			
Address	Owner		
172-174 Middlesex Street	Joel Nieves		
178-180 Middlesex Street	VictorM and Rosaura Lozada		
184 Middlesex Street	Patricia Long Trustee		
190 Middlesex Street	Ferris F and Omowunmi Shelton		
194 Middlesex Street	Graduate Housing		
210 Middlesex Street	Patrcia A Bernard		
216 Middlesex Street	Louis DeJesus		
220-222 Middlesex Street	Graduate Housing		
207 Middlesex Street	Beryl Irene Bailey		
199 Middlesex Street	Daniel T Richards		
191-193 Middlesex Street	Victor Dupre Jr		
187-189 Middlesex Street	Value Properites LLC		
183 Middlesex Street	Springfield College		
173-175 Middlesex Street	Raleigh L Turner		
163-165 Middlesex Street	Myrtle V and Lorraine B Davis		
140-142 Middlesex Street	Daniel J and Vera M Brantley		
132-134 Middlesex Street	Kelvinson R Duran		
128 Middlesex Street	Eleuterio L Santana Jr.		
122 Middlesex Street	Krystal A Corbin		
116 Middlesex Street	Raymond Reyes		
110-112 Middlesex Street	Domingos M and Maria E Barroso		
104-106 Middlesex Street	Leon A Blake		
100-102 Middlesex Street	VMC Investments LLC		
96-98 Middlesex Street	Herman A and Karene A Smith		
15-17 Marlborough Street	Linval and Winsome Samuels		
27-29 Marlborough Street	Norma Samuels Moore		
93-95 Middlesex Street	Justin Curtis Ching		
99-100 Middlesex Street	PFGC LLC		
103 Middlesex Street	Charles E Brantley		
107-109 Middlesex Street	Joseph and Minnie Gill		
113-115 Middlesex Street	Radhames D Rodriguez		
119-121 Middlesex Street	Harvey R and Donna Patterson and Richardo Johnson		
125-127 Middlesex Street	Doris Martinez		
131-133 Middlesex Street	Cheryl and Garnett Duckelly Osborne		
137-139 Middlesex Street	Edward C Kennedy Trustee		

Westford Circle Valve Operations Plan





SECTION 00020

Water Infrastructure Improvements at Liberty Street and Westford Circle

Springfield Water and Sewer Commission IFB No. 24-67

INVITATION TO BID

The Springfield Water and Sewer Commission, Springfield, Massachusetts (Commission, Owner, SWSC), the Awarding Authority, invites sealed bids for the Project: "Water Infrastructure Improvements at Liberty Street and Westford Circle – SWSC Bid No. 24-67", in the City of Springfield, Massachusetts.

Sealed bids will be received at the Offices of the Springfield Water and Sewer Commission, at the John J. Lyons Administration Building at Bondi's Island, 250 M Street Extension, Agawam, MA 01101 or by mail at the John J. Lyons Administration Building at Bondi's Island, 250 M Street Extension, Agawam, MA 01101 until **2:00 p.m**. on **May 1, 2024** at which time all bids will be publicly opened and read aloud.

Bidders shall note that the United States Postal Service and major commercial delivery or package express companies deliver to the business office at 250 M Street Extension. It is the Bidder's responsibility to ensure that their proposal is received at the office of the Commission by the closing date and time.

The nature and general scope of work of the Contract includes the installation of approximately 3,900 linear feet of 8-inch water main replacement on Liberty Street and Westford Circle including water main connections to side streets and service connections. Work on Liberty Street is to be substantially completed in 2024 while work on Westford Circle may be completed in 2025.

The time for completion of this project is **450 calendar days** from the written Notice to Proceed. **Substantial completion of Liberty Street is required within 180 calendar days** from the Notice to Proceed. Substantial completion will be considered all work, identified in the Contract with the exception of permanent pavement restoration.

Street opening permits will typically not be issued by the Springfield DPW between December $1^{\rm st}$ and April $1^{\rm st}$. The Contractor is advised that liquidated damages of the minimum sum of \$1,500.00 per day shall apply if the date of substantial completion is not met. The Contractor is required to submit a proposed construction schedule with the bid.

Bidding procedures shall be in accordance with M.G.L. c. 30, § 39M, as most recently amended, and all other applicable laws.

The estimated project value is approximately: \$2,450,000

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Plans and specifications will be available beginning on **April 10, 2024.** Contract Documents will also be available for pick-up at

www.biddocsonline.com (may be viewed electronically and hard copy requested). Bidders requesting Contract Documents to be mailed to them shall include a separate check for \$40.00 per set for UPS Ground (or \$65.00 per set for UPS overnight), payable to BidDocs Online Inc. to cover mail handling costs (these costs are estimated and are subject to increase). A deposit will not be required for each set of plans and specifications requested by interested bidders.

All questions must be made in writing and received by the SWSC Chief Procurement Officer, Theo G. Theocles, Esq., no later than **April 24, 2024**, via the following contact: theo.theocles@waterandsewer.org.

The contract documents may be examined at the Offices of the Springfield Water and Sewer Commission, 250 M Street Extension, Agawam, MA 01101.

A pre-bid conference for the Project will not be held for this project.

All bids shall be accompanied by a bid deposit in an amount no less than five percent (5%) of the value of the bid, in the form of a bid bond, certified cashier's check or treasurer's check issued by a responsible bank or trust company made payable to the Springfield Water and Sewer Commission.

A performance bond in an amount equal to 100 percent of the total amount of the bid will be required for faithful performance of the contract as well as labor and materials bond in an amount equal to 100 percent of the total bid amount. The surety company must be qualified to do business in the Commonwealth of Massachusetts, and the form of surety must be satisfactory to the Springfield Water and Sewer Commission.

Every bid bond, every performance bond and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized to do business in the Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

General Contractors shall be required to comply with all applicable Massachusetts General Laws.

Minimum Wage Rates both as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, and as required by the Davis-Bacon wage determination of the Secretary of Labor apply to this project. The greater of the two wage determinations shall govern for each class or worker. It is the responsibility of the contractor, before bid opening, to request, if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this Contract.

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This project will receive funding from the U.S. Environmental Protection Agency (EPA) Water Infrastructure Finance and Innovation Act (WIFIA) loan program. As such, federal regulations will apply to this contract including, but not limited to:

- a. Davis-Bacon Wage Requirements
- b. American Iron and Steel Requirements
- c. Disadvantaged Business Enterprise Requirements
- d. Federal Nondiscrimination Requirements
- e. Federal Interest Inclusion

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals for this project are a minimum of **4.8 percent D/MBE participation and 6.9 percent D/WBE** participation by certified DBEs. The two low bidders shall submit completed DBE forms (EEO-DEP-190C, EEO-DEP-191C and the DBE Certification of United States Citizenship form) by the close of business on the third business day after bid opening. Failure to comply with the requirements of this paragraph may be deemed to render a proposal non-responsive. No waiver of any provision of this section will be granted unless approved by the <u>Department of Environmental Protection (MassDEP)</u>. The Awarding authority requests copies of these form also be sent to its attention (theo.theocles@waterandsewer.org).

The Springfield Water and Sewer Commission reserves the right to reject any or all bids if it is in the public interest to do so. The Springfield Water and Sewer Commission reserves the right to waive any informality in if deemed it its best interest to do so as may be allowed by statute

THEO G. THEOCLES, ESQ.
DIRECTOR OF LEGAL AFFAIRS/CHIEF PROCUREMENT OFFICER
SPRINGFIELD WATER AND SEWER COMMISSION
250 M STREET EXTENSION
AGAWAM, MASSACHUSETTS 01001

END OF SECTION 00020

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