

**TOWN OF NORWOOD
DEPARTMENT OF PUBLIC WORKS**

INVITATION FOR BIDS (NPW-22-05):

**Proposed Bridge Replacement
Westover Parkway over Germany Brook (N-25-034) (C9P)
Norwood, Massachusetts**



January 5, 2021

**Town of Norwood
Department of Public Works
John J. Carroll Administration Building
1 Lyman Place
Norwood, MA 02062
Telephone: (781) 762-1413**

Mark Ryan, P.E., P.L.S., Director of Public Works/Town Engineer

SECTION A - ADVERTISEMENT FOR BID
TOWN OF NORWOOD, MA

Sealed bids will be received up to 11:00 A.M.(Verizon time), January 28, 2022, in the Purchasing Department, Norwood Town Hall, 566 Washington Street, 3rd Floor, Norwood, MA 02062 for the following Public Project:

"Proposed Bridge Replacement - Westover Parkway over Germany Brook (N-25-034)(C9P)"

Bids must be delivered prior to 11:00 A.M. Call 781-762-1240, x6036 or 6037 to confirm delivery.

Bidders must be pre-qualified to perform the work described in these specifications in accordance with Massachusetts General Law (MGL) Chapter 29, Section 8B and Chapter 90, Section 34. The contractors must be pre-approved by Mass. Highway Department prior to receiving an official proposal form.

The complete bid package may be obtained **electronically by registering and downloading online at: <https://bids.norwoodma.gov>**. The bid must be filled out and signed as directed herein, sealed in an opaque envelope addressed to the Purchasing Department, endorsed with the name and address of the bidder, and marked, **Westover Parkway Bridge Replacement, CONTRACT #NPW-22-05"**.

A pre-bid conference will be held on January 19, 2022, at 11:00 A.M., at the project location.

Those wishes to arrange a site visit must contact Mark Ryan at: MRyan@norwoodma.gov or call (781) 762-1413 to make arrangements. The Town reserves the right to limit the number of bidder representatives who attend any site visit.

A certified check or bid bond, with acceptable surety in favor of the Town of Norwood and equal to at least five percent (5%) of the bid, must be submitted with the bid. The successful bidder shall, within ten (10) days of notification of award furnish the Town a performance bond and labor and materials bond in an amount equal to one hundred percent (100%) of the bid.

Bids shall be prepared, considered, and the contract awarded in accordance with all statutes governing such contracts (MGL Chapter 30 and Chapter 149 as amended). Every General Bid shall be on forms furnished by the Town. Bids submitted on other forms may be rejected. The award of the contract shall be made within 30 working days after the opening of General Bids, Saturdays, and Sundays excluded.

An award will not be made to a Contractor who is not properly equipped to undertake and complete the work. The right is reserved to waive any informality and to reject any or all bids in accordance with the provisions of MGL as amended.

The Town of Norwood notifies all bidders that it will affirmatively insure that minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, gender, color, creed or national origin in consideration for an award. The Construction Phase is a combined MBE and WBE goal of 10.4%. A reasonable representation of both MBE and WBE firm participation is required. A Schedule for Participants is to be included with your bid.

Contractors shall take Affirmative Action to negotiate with qualified minority or women-owned subcontractors in accordance with MGL Chapter 193.

Wages are subject to minimum wage rates under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27D inclusive, as most recently amended.

The right is reserved to reject any or all bids or to accept any part of a bid or the one deemed best for the Town.

BY: Tony Mazzucco, General Manager

Norwood Record 1/13/2022
Central Register 1/12/2022
Commbuys 1/5/2022

Bill To: General Manager's Office
P.O. Box 40
Norwood, MA 02062
ATTN: C. Carney
(781) 762-1240

SECTION A - ADVERTISEMENT FOR BID	1
SECTION B - INSTRUCTION TO BIDDERS	4
1 GENERAL	4
2 PREPARATION AND SUBMISSION OF BIDS	4
3 BIDS	4
4 BID BONDS OR SURETY	5
5 OPENING AND CONSIDERATION OF BIDS	5
6 AWARD OF CONTRACT	5
SECTION C - GENERAL CONDITIONS	7
1 PRODUCT SPECIFICATION AND ALTERNATES	7
2 PATENT INFRINGEMENT	7
3 PLACEMENT OF ORDERS	7
4 CONTRACT BONDS REQUIRED	7
5 CLARIFICATION OF TERMS	8
6 ALL CONTRACTS ARE SUBJECT TO APPROPRIATION	8
7 SALES TAX EXEMPTION	8
8 PREVAILING WAGE RATES	8
9 MAKING A PRICE QUOTE	8
10 GUARANTY, WARRANTY AND PERFORMANCE BOND	9
11 DELIVERY CHARGES	9
12 MAXIMUM DELIVERY DATE OR COMMENCEMENT DATES	9
13 REVENUE ENFORCEMENT AND PROTECTION PLAN	9
14 ASSIGNMENT AND/OR ORGANIZATION CHANGES	9
15 REVENUE SHARING HANDICAPPED REGULATIONS	9
16 WORK IN HARMONY	10
17 LEGAL BASIS (MGL)	10
18 MINORITY BUSINESS ENTERPRISES	10
19 INSURANCE REQUIREMENTS	10
21 PRICE INCLUSIONS	11
22 SITE VISITS	11
23 QUALIFICATIONS	11
24 ACCEPTANCE OF WORK	11
26 PROTECTION OF WORK	12
27 WORK IN PROGRESS AND FINAL	12
28 SANITARY CONVENIENCE	12
29 CARE OF MATERIALS	12
30 MATERIALS TO BE REMOVED	12
31 LIGHTS, GUARDS, ETC.	12
33 CONSTRUCTION AND LABOR CONDITIONS	12
34 NIGHT, SUNDAY OR HOLIDAY WORK	12
35 REQUIRED POLICE OFFICERS	13
36 REMOVAL OF POSTAL BOXES	13
37 WORK BY OTHERS	13
38 TIME	13
39 TIME OF COMPLETION	13
40 ACCESS TO WORK	13
41 DEFECTIVE WORK, APPROVALS, ETC	14
42 EMPLOYEES TO BE COMPETENT	14
43 NOT TO ASSIGN OR SUBLET	14
44 ALTERATIONS AND EXTRA WORK	14
45 RESPONSIBILITY	14
46 ABANDONMENT OF WORK, ETC.	14
47 TWENTY-FIVE PERCENT CLAUSE	15
48 CONTRACTOR CLAIMS	15
49 MONEY TO BE RETAINED	15
50 COMPENSATION TO BE PAID CONTRACTOR	15
51 LAWS AND REGULATIONS	16
52 STATE AND FEDERAL REQUIREMENTS	16

53	CONTRACTOR TO PAY ALL LABOR, ETC.	16
54	STATUTORY SECURITY PROVIDED ONLY BY BOND	16
55	PROGRESS ESTIMATES	16
56	FINAL ESTIMATE AND PAYMENT	17
57	PAYMENT OF FINAL ESTIMATE TERMINATES LIABILITY TO TOWN	17
58	GUARANTY	17
59	LEGAL ADDRESS	18
60	COMPLIANCE WITH CHAPTER 370 ACTS OF 1963	18
61	STATUTORY PROVISIONS	18

SECTION D - PROJECT SPECIAL PROVISIONS	23
--	----

SECTION E - PRICING AND CONTRACT PAGES	57
1 QUANTITIES & BID TABS	57
2 CERTIFICATIONS	63
3 SIGNATURES	64
4 CHECK LIST	64
5 CERTIFICATE OF VOTE	65

APPENDICES

APPENDIX A -	PROPOSED CONSTRUCTION DRAWINGS TITLED "PROPOSED BRIDGE REPLACEMENT, WESTOVER PARKWAY OVER GERMANY BROOK (N-25-034)(C9P) NORWOOD, MA 02062" DATED JULY 28, 2021
APPENDIX B -	ENVIRONMENTAL PERMITS
APPENDIX C -	RELEVANT TECHNICAL REPORTS & DOCUMENTS
APPENDIX D -	PREVAILING WAGE RATES

SECTION B - INSTRUCTION TO BIDDERS

1 GENERAL

1.1 The Bid Documents, which form the contract, consist of the following (including all modifications thereof, incorporated in any of the documents before the execution of the contract):

- A. Advertisement for Bids
- B. Instruction to Bidders
- C. General Conditions
- D. Specifications
- E. Contract Document and Bid Page

2 PREPARATION AND SUBMISSION OF BIDS

2.1 A Bidder who desires to submit a Bid for the task contemplated in the Advertisement Section A) shall thoroughly review and be familiar with the Specifications and Contract Documents and site conditions before submitting a bid. Those wishes to arrange a site visit must contact Mark Ryan at: MRyan@norwoodma.gov or call (781) 762-1413 to make arrangements. Social distancing must be adhered to at all times. The Town reserves the right to limit the number of bidder representatives who attend any site visit.

3 BIDS

3.1 Each Bid shall conform to the following:

3.1.1 It shall be on the forms furnished by the Town which are included in the Bid Package and titled **Contract Document and Bid Page**.

3.1.2 It shall be completely filled in by printing in ink or by typewriter.

3.1.3 It shall be placed and delivered in an opaque sealed envelope and shall be addressed as follows:

3.1.3.1 Purchasing Department
Norwood Town Hall
566 Washington Street
3rd Floor
Norwood, MA 02062

"BID FOR: WESTOVER PARKWAY BRIDGE REPLACEMENT, CONTRACT NPW-22-05"

3.2 A Bid shall not be considered which is not in the possession of an authorized representative of the Purchasing Department by the time indicated in the advertisement for the opening of the subject Bid. Bids must be delivered prior to 11:00 A.M. Call 781-762-1240, x6036 or x6037 to confirm delivery.

3.3 A Bid must be signed, as follows:

3.3.1 If Bidder is an individual, personally;

3.3.2 If Bidder is a partnership, by the name of the partnership, followed by the signature of each partner;

3.3.3 If operating under the Fictitious Names Act, by the name of fictitious identity, followed by signature of each owner;

3.3.4 If a corporation, by an authorized officer, whose signature shall be attested by the Secretary of the Corporation and the Corporate Seal affixed.

3.3.5 A Bid may be withdrawn at any time up to one (1) hour prior to the time set for the opening of the bid provided the request for withdrawal is presented in writing, signed by the Bidder in the manner and form required for submitting of a Bid.

3.3.6 Failure to properly execute the contract shall be grounds for rejection of the Bid.

3.3.7 The Bidder (contractor) shall faithfully fulfill the terms, conditions, and specifications at the prices quoted in the contractor's sealed Bid to the Town. By signing the contract, the bidder acknowledges all terms and conditions set forth in all sections of the Bid package.

4 BID BONDS OR SURETY

- 4.1 Pursuant to the terms and conditions set forth, a bid bond or surety shall be required in an amount specified by the Town. Violation or misrepresentation of the contract and the prices quoted shall be grounds to forfeit the bid bond or surety in favor of the Town.
- 4.2 In order to insure faithful fulfillment of its terms, each bid shall be accompanied by a security of 5% of the bid price, satisfactory to the Town, or by a certified check in that amount, payable to the Town of Norwood. Such securities shall be returned to the bidder unless retained by the Town under conditions hereinafter stipulated. A bid bond will be accepted as security.
- 4.3 Should the successful bidder fail to execute the contract and furnish the bonds and certificate of insurance within the time stipulated, the Town may, at its option, determine that the Bidder has abandoned the Contract and thereupon the bid and acceptance shall be null and void. The guaranty accompanying the bid shall be retained and collected by the Town as liquidated damages for the delay and expense caused by the abandonment of the contract.
- 4.4 The bid security of all bidders, with the exception of the three lowest eligible bidders, will be returned within ten (10) working days after the opening of bids. The bid security of these three bidders will be returned upon execution and delivery of the contract, if an award is made, or will be returned upon expiration of said thirty-day period if no such award is made, unless forfeited by failure to execute the contract as herein before provided.

5 OPENING AND CONSIDERATION OF BIDS

- 5.1 Each Bid shall be opened at the time and place called for in the Advertisement (Section A) and shall be read publicly.
- 5.2 Consideration and acceptance of Bids shall be based on the ability of the Bidder to meet the specifications for the item(s) legally advertised and set forth in the terms, conditions, and specifications of this package and subsequent contract documents.
- 5.3 All exceptions, changes, modifications, alternates, interlineations, etc., must be clearly noted, explained and identified by the initials of the signing parties. If Bidder's stationery is used, it shall be signed and executed as specified herein and shall be considered as part of the Bid and Contract. Substantive or material exceptions may be cause for rejecting the bid.
- 5.4 The Town, in considering each Bid, shall, prior to any determination and a subsequent award, investigate and evaluate the Bidder.
- 5.5 The Town shall have the right to reject any and all Bids or parts thereof, or items therein, and to waive any defect or irregularities as to form, therein.
- 5.6 No Bid shall be withdrawn within thirty (30) days after the opening thereof. The Town shall have the time as indicated in which to investigate, evaluate and grant or reject the Bids. No Bid shall be withdrawn, changed, or altered within the said time.

6 AWARD OF CONTRACT

- 6.1 Within the time specified in the instructions for the award of the contract, the Town shall either reject all Bids or award the contract to that responsible bidder who best meets the specified need, price and other factors considered. The Town reserves the right to reject any or all bids and to waive such informalities as may be permitted by law. The contract will be awarded the lowest responsible and eligible bidder possessing the skill, ability and integrity necessary to the faithful performance of the work.

- 6.2 The formal notification date shall be the date in which the formal contract is authorized. This date shall be the date typewritten on an award letter and/or a purchase order, which shall be signed by an authorized Town official. In cases where both are issued, the date typewritten on the award letter shall supersede all other dates.
- 6.3 In those situations wherein multiple Bids are substantially identical:
- 6.3.1 A certified minority- or woman-owned or veteran-owned business may be given first preference.
 - 6.3.2 A Norwood business entity may be given second preference.
 - 6.3.3 If multiple bids are still substantially identical, the winning bid will be determined by drawing lots.

SECTION C - GENERAL CONDITIONS

1 PRODUCT SPECIFICATION AND ALTERNATES

- 1.1 Any and all items that are mentioned in the contract by commercial name, trade mark, or any other specific identification, shall not be construed to exclude alternate items or products not mentioned by name which are comparable with respect to quality, form, fit and function. Such reference shall not limit competition, but shall be used to establish a certain standard of quality or a minimum specification.
- 1.2 All alternate items and or products shall be specifically identified and submitted in writing with the sealed Bid. The Town shall maintain the right to evaluate the alternate prior to contracting, purchasing, use or fabrication of the alternate. Subject to the provisions of the Massachusetts General Laws, Chapter 30, Section 39J, approval shall be at the sole discretion of the Town, shall be in writing to be effective, and the decision of the Town shall be final.

2 PATENT INFRINGEMENT

- 2.1 The contractor shall indemnify and save harmless the Town and all persons acting for or on behalf of it from all suits and claims against them, or any of them, arising from or occasioned by the use of any material, equipment, or apparatus, or any part of any such suit is held to constitute infringement, the contractor, within a reasonable time, will at his expense, and as the Town may elect, replace such material, equipment or apparatus with non-infringing material, equipment or apparatus, or remove the material, equipment or apparatus and refund the sums paid thereof.

3 PLACEMENT OF ORDERS

- 3.1 All orders for labor, materials, supplies, equipment or apparatus shall be placed in writing only. Verbal orders are not binding, and the contractor takes his own risk if he performs under such orders. All notices, demands, requests, instruction, approvals, and claims must be confirmed in writing before action is taken, except in those cases that require prompt action to preserve welfare and safety. Any such violation may result in an unenforceable claim.

4 CONTRACT BONDS REQUIRED

- 4.1 **A Performance Bond** in the full amount (**100%**) of the contract will be required by the Town within 10 days of the date of the award letter to ensure the faithful performance of the Contract. The bond or surety shall remain in force throughout the guaranty period, warranty period, or period so specified by the Town, for all projects, products, materials, supplies, equipment, apparatus or other designated bid items.
- 4.2 **A Payment Bond** in the full amount of the contract price (**100%**) will be required to be furnished by the Contractor to the Town as security for payment by the Contractor and Subcontractors for labor, materials, rental equipment and for such other purposed as are more specifically set forth in MGL, Chapter 149, Section 29, and Chapter 30, Section 39A and all amendments thereto.
- 4.3 The payment bond referred to in Chapter 149, Section 29 and Chapter 30, Section 39A is the sole security, under said sections for payment by the contractor and subcontractor for labor performed or furnished and materials used or employed therein; said security to remain in force until the validity of all such claims shall be established and finally determined and if determined and established as valid, all such claims shall be paid by the surety.
- 4.4 The Performance Bond and the Payment Bond shall be in a form satisfactory to the Town, furnished by a surety company incorporated pursuant to Chapter 175, Section 105 of the MGL or authorized to do business in the Commonwealth under Chapter 175, Section 106 of the MGL and satisfactory to the awarding authority. The name of the agency or agent writing these bonds shall be identified with or on the bond.
- 4.5 All alterations, extensions of time, extra work and any other changes authorized under these specifications, or under any part of the Contract may be made without obtaining the consent of the surety or sureties on the contract bonds.

4.6 The contractor shall fulfill all obligations, terms, conditions, and prices set forth in order to meet the contract agreement in full. This is inclusive of all renegotiated items or change orders that have been properly acknowledge in writing and signed by the contractor and the Town of Norwood.

5 CLARIFICATION OF TERMS

5.1 The term: day or working day shall be interpreted to mean Monday, Tuesday, Wednesday, Thursday, Friday exclusive of legal holidays and weekends.

5.2 The terms: Contractor, Supplier, Seller, or Bidder shall be interpreted to mean the individual, company or corporation making a sealed Bid to the Town of Norwood for the item(s) or project(s) as advertised in Section A and specified in the bid package. Whenever the word "Contractor" is used in this agreement, it shall be understood to include heirs, executors, administrators, successors, and assigns. The Contractor shall do all the work and furnish all the material except as herein otherwise specified, necessary or proper for performing and completing the work hereinafter specified.

5.3 The term: Owner, Town, Department of Public Works or Norwood shall be interpreted to mean the Town of Norwood, located in Norfolk County, Massachusetts, by its General Manager at 566 Washington Street, in Norwood.

6 ALL CONTRACTS ARE SUBJECT TO APPROPRIATION

6.1 The execution of a contract is subject to adequate financial appropriations for the item(s) or project(s) advertised. The lack of adequate financial appropriation by the Town for the Bid item(s) or project(s) constitutes grounds to reject all Bids or those Bids that exceed the financial limitations imposed by Norwood's Town Meeting.

7 SALES TAX EXEMPTION

7.1 The Town of Norwood is exempt from State Sales Tax under the Sales Act, Chapter 14 of the Acts of 1966 and all amendments thereto. All purchases of supplies and materials in relation to the project are therefore exempt. This should be considered when forming contract prices.

8 PREVAILING WAGE RATES

8.1 Bidders shall make themselves aware of the provisions of Massachusetts General Law, Chapter 149, Section 26 to 27F before filing a sealed Bid with the Town.

8.2 This law refers to the prevailing wage rate minimums as set forth by the Massachusetts Department of Labor and Industries, 100 Cambridge Street, Boston, MA 02202.

8.3 The Contractor shall complete and furnish the **"Statement of Compliance" form to the Commissioner of Labor and Industries within 15 days** after completion of the work.

8.4 The rate schedule and the appropriate regulations relating to the subject law will be upheld and in force for all contracts set by the Bidder and the Town of Norwood.

8.5 The on-site work associated with this project falls under the wage rates categories. Contract prices shall be set accordingly. The Town will have copies of the latest edition of the prevailing wage rates as determined by the Department of Labor and Industries upon request.

8.6 **The successful Bidder must submit weekly payroll records to the awarding authority for all employees who have worked under this contract. Employers also must preserve these records for three years.**

9 MAKING A PRICE QUOTE

9.1 The bid shall be submitted on the forms provided by the Town. The bidder shall specify unit prices in both words and figures, for each item for which a quantity is given, and shall also show the products of the representative unit prices and quantities (written in figures in the column therefore), and the total amount of the figures shall be legibly written in ink. In case of a discrepancy between the words and figures, the written words shall govern.

9.2 Bid forms shall be completely filled in, signed and properly sealed before submission. Bids which are incomplete, conditional or obscure, or which contain additions not called for, may be rejected. Use the SECTION E pages of this document when submitting the bid. All bids will be evaluated on the estimate of cost.

10 GUARANTY, WARRANTY AND PERFORMANCE BOND

10.1 When the project, service, material, supplies, equipment, etc., herein described or specified has been delivered and accepted by the Town, the required performance bond shall guarantee the faithful and full performance of the item(s) for a minimum period of sixty (60) calendar days.

10.2 This condition shall be superseded by any condition speaking to warranties or guarantees set forth in the Contract Document, Specifications or properly noted as an exception by the bidder in the sealed Bid.

11 DELIVERY CHARGES

11.1 The price(s) quoted which correspond with the item(s), i.e., project service, material, supply, equipment, etc., specified herein shall incorporate and include all delivery and/or freight costs FOB work site.

11.2 This condition shall be superseded by any specific term or condition written in the Contract Document and Bid Section, Specifications Section, or properly written as an exception by the bidder in the sealed Bid. All exceptions of this nature shall be fully explained and priced or they may be rejected by the Town and the conditions regarding "delivery charges" implemented.

12 MAXIMUM DELIVERY DATE OR COMMENCEMENT DATES

12.1 Construction is to begin no sooner than March 15, 2022. The project shall be completed no later than November 30, 2022. All in-water work shall be in accordance with any requirements of the environmental permits issued for the project.

13 REVENUE ENFORCEMENT AND PROTECTION PLAN

13.1 Pursuant to M.G.L. Chapter 62C, Section 49A, the contractor shall provide its Social Security number or Federal Identification number. An area for this number is provided in the Contract Document or as instructed herein. These statements are attested when the Bid is properly signed and executed.

13.2 By signing this Bid, the contractor shall certify that under penalties of perjury, the signing party has filed all State tax returns and has paid all State taxes required under law.

14 ASSIGNMENT AND/OR ORGANIZATION CHANGES

14.1 The Contractor shall not assign the Contract nor sublet it in whole or in part (unless specifically authorized in this Contract Document), or delegate any of the work to be performed to any other person, firm, company, corporation, or organization without the written permission of the Town. The Contractor shall not assign any monies due, or to become due to him under this Contract, without the previous written consent of the Town.

14.2 The bankruptcy, takeover or merger, outright purchase, majority stock purchase by another organization, or other change in ownership or status of the Contractor, or any assignment for the benefit of creditors shall, at the election of the Town:

14.2.1 Terminate this Contract with all pertinent Contractual conditions contained herein effected in favor of the Town.

14.2.2 Fully obligate the newly formed organization, corporation and/or legal entity to fulfill all terms and conditions of the Contract, and to perform or supply items in accordance with the specifications or descriptions contained herein.

14.2.3 Failure of any Subcontractor to perform shall not relieve the Contractor of its obligation to fulfill the terms and conditions of the Contract as set forth herein.

15 REVENUE SHARING HANDICAPPED REGULATIONS

15.1 This notice is published pursuant to the requirements of Section 51.55 (most recent revision) of the Revenue Sharing Regulations, as published in the Federal Register. Section 51.15 prohibits discrimination against qualified individuals because of their handicapped status.

15.2 THE TOWN OF NORWOOD, MASSACHUSETTS, advises the public, employees, and job applicants that it does not discriminate on the basis of handicapped status in admission or access to, or treatment or employment in, its programs and activities.

15.3 THE TOWN OF NORWOOD has designated **Tony Mazzucco, General Manager, Phone: (781) 762-1240** as the contact person for inquiries, complaints or reports regarding handicapped status.

16 WORK IN HARMONY

16.1 In accordance with Section 44E, Chapter 149, M.G.L. the bidder by signing the Bid certifies ability to furnish labor that can work in concert with all other elements of labor employed or to be employed at the work site(s).

17 LEGAL BASIS (MGL)

17.1 All Bid procedures are subject to the most recently amended provisions of Massachusetts General Laws Chapter 30, Sections 39A through 39R. The provisions of these statutes shall preempt any contrary or inconsistent provisions in the Contract Documents.

18 MINORITY BUSINESS ENTERPRISES

18.1 The Town of Norwood hereby notifies all Bidders that minority business enterprises will be afforded full opportunity to submit bids in response to the Advertisement to Bid and will not be discriminated against on the grounds of race, color, gender, or national origin in consideration for an award.

19 INSURANCE REQUIREMENTS

19.1 Before starting any work on this contract the Contractor shall furnish evidence of insurance coverage for payment of compensation, the furnishing of other benefits under Chapter 152 of the General Laws (Worker's Compensation Law) to all persons to be employed during the work covered by these specifications, and shall continue such insurance in full force and effect during the term of this project. Under Chapter 152, Section 25C, failure to provide Worker's Compensation shall result in a stop work order requiring cessation of all business operations at the place of business or job site; a civil penalty of \$100.00/day for each day not in compliance; a fine of not more than \$1,500.00, imprisonment for not more than 1 year, or both; and withholding of the issuance or renewal of licenses or permits to operate business or construction buildings in the State. Failure to provide and continue in force such insurance and aforesaid benefits shall be deemed a material breach of any contract covering the project and shall operate as an immediate termination thereof at the election of the Awarding Authority. Said insurance shall be written with such company as may be acceptable to the Awarding Authority, and the policy shall be submitted to the Awarding Authority for examination if it so desires. Satisfactory certificates of said insurance shall be filed with the Awarding Authority prior to the commencement of any work by the Contractor on this project.

19.2 The Contractor shall carry general liability insurance in connection with all operations included in these specifications in which the Town of Norwood is named as insured. The amounts of insurance coverage shall be:

Bodily Injury Liability	\$250,000/\$500,000
Property Damage Liability	\$100,000 or
Combined Single Limit	\$500,000
Catastrophe Umbrella Liability	\$1,000,000

19.3 The Contractor shall effect and maintain insurance against all risks of physical loss upon all work in place and all materials stored at any work site, whether or not covered by payments made by the Awarding Authority. This insurance shall be in an amount equal to the full replacement cost thereof at all times, and shall be for the benefit of the Town of Norwood, and the Contractor, as their interest may respectively appear. This insurance shall be placed with such company or companies as may be acceptable to the Awarding Authority.

19.4 In the event that the form of any policy or certificates of insurance required under this contract or the amount thereof, is not especially specified herein, or the companies writing the same are not satisfactory to the Awarding Authority, the Contractor will secure other policies or certificates in form and amount and with companies satisfactory to the Awarding Authority. The Contractor shall not cause any policies to be canceled or to permit them to lapse, and all insurance policies shall include a clause to the effect that the policy shall not be canceled or changed until fifteen days after the Awarding Authority, as hereinbefore defined, has received written notice thereof as evidence by return receipt of registered letter. All certificates of insurance shall contain true transcripts from the policy, authenticated by the proper officer of the insurer, evidencing particularly that the Town of Norwood and the awarding Authority are included as among those insured, the extent of the insurance, the location and operations to which the insurance applies, the expiration date, and the above-mentioned notice of cancellation clause.

19.5 All insurance shall be paid for by the Contractor.

20 LIQUIDATED DAMAGES

20.1 The sum of Five Hundred Dollars (\$500) per day is to be agreed upon as liquidated damages and shall be paid by the Contractor to the Owner for each and every calendar day the requirements of Section 12.2 are not met. Reductions for liquidated damages shall be made from payments due the Contractor.

21 PRICE INCLUSIONS

21.1 The price for any item bid and/or contracted for, unless otherwise noted or specified, shall include full compensation for all materials, equipment, tools, labor and incidental work necessary to complete the work to the satisfaction of the Engineer. The price shall include, without exception, all royalties and costs arising from patents, trademarks, or copyrights which are in any way involved in the work.

22 SITE VISITS

22.1 The bidder is expected to examine carefully the site(s) of the proposed work, the plans, specifications, special provisions, and contract forms before submitting a bid. A list of the "proposed" sites shall be included in the specification section of this contract document. The submission of a bid shall be considered prima facie evidence that the bidder has made such examination of the sites of the proposed work, plans, etc., and is familiar with the conditions to be encountered in performing the work and as the requirements of the plans, specifications, special provisions, and contract.

23 QUALIFICATIONS

23.1 No contract will be awarded except to responsible established bidders capable of performing the class of work contemplated. Before the awarding of the contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work in a satisfactory manner and within the time stipulated. The bidder may be required to furnish the Town with statements as to his experience and financial status.

23.2 All contractors bidding this project shall be pre-qualified in accordance with Section 2.01 of the Department of Public Works, Standard Specifications and Chapter 29 of the General Laws as most recently amended.

24 ACCEPTANCE OF WORK

24.1 All the work under this contract shall be done to the satisfaction of the Superintendent of Public Works, who shall in all cases determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for hereunder and shall decide all questions which may arise as to fulfillment of this contract on the part of the Contractor. The determination and decision by the Superintendent shall be final and conclusive; and in such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

25 The Town will furnish basic information pertaining to layouts, bench marks, etc., sufficient for controlling the locations and grades of the work. The Contractor shall,

- at his own expense, furnish all necessary equipment, personnel, stakes, etc., and shall lay out the work in detail, as required, including lines and grades as necessary in each instance. All reference marks shall be verified by a surveying instrument at frequent intervals and the Contractor shall be responsible for the accuracy of all lines and grades relating to the project.
- 26 PROTECTION OF WORK: All work is to be carefully protected so that no injury will come to it from water, frost, accident, or other cause, and any injury that may come to the work is to be repaired by the Contractor.
- 27 WORK IN PROGRESS AND FINAL: Extreme care is to be taken that the work, and all appurtenances, shall be done carefully, well, and completely, and if later errors or poor work are discovered, they shall be thoroughly repaired and rectified by the Contractor up to the time of the acceptance of the entire contract by the Superintendent of Public Works.
- 28 SANITARY CONVENIENCE: The Contractor is to provide all necessary sanitary conveniences, properly secluded from the public observation, and shall carry out all directions given to same by the Superintendent of Public Works.
- 29 CARE OF MATERIALS: The Contractor is to have charge of, and be liable for the loss of, or injury to, any materials delivered to him, or in the vicinity of the work, to be used thereon, and to furnish men to handle them for examination by the Superintendent of Public Works or their assistants; shall keep trimmed up in piles so placed so not to endanger them, all materials so delivered, whether furnished by him or the Town, and all refuse, rubbish and materials until removed, and shall not occupy private land without the approval of the Superintendent of Public Works and permission from the Owner or his authorized agent.
- 30 MATERIALS TO BE REMOVED: The Contractor is to promptly remove from the work and its vicinity all rejected materials and the surplus earth, refuse, rubbish and excavated materials, to such points as shall be directed by the Superintendent of Public Works and dispose of them without expense to the Town.
- 31 LIGHTS, GUARDS, ETC.: The Contractor shall at all times leave an unobstructed way along public and private ways for travelers, autos, and trucks, and for access to hydrants; shall, through the whole of every night, place and maintain over or near all places in the public or private ways obstructed or made unsafe by the Contractor in doing the work, and over or near all materials for the work placed therein, sufficient lights to protect travelers over or around such places, and materials; shall not unnecessarily inconvenience the neighboring residents; shall provide all necessary fences, guards and watchmen; shall build bridges and ways for access to property where the existing access is cut off by him, and shall take all proper precautions to protect persons and property from injury by the carrying on of work.
- 32 MAINTENANCE OF TRAFFIC:
- 32.1 Unless permission to close a street is received in writing from the proper authority, all excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, he shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the Engineer.
- 32.2 Detours around construction will be subject to the approval of the Owner and the Engineer. Where detours are permitted, the Contractor shall provide all necessary barricades and signs as required to divert the flow of traffic. While traffic is detoured, the Contractor shall expedite construction operations and periods when traffic is being detoured will be strictly controlled by the Owner.
- 32.3 The Contractor shall take precautions to prevent injury to the public due to open trenches. Police protection shall be provided for traffic while work is in progress. The Contractor shall be fully responsible for damage or injuries whether or not police protection has been provided.
- 33 CONSTRUCTION AND LABOR CONDITIONS: Bidders are required to inform themselves fully of the conditions relating to construction, and labor under which the work will be or is now being performed, and this Contractor must employ so far as possible, such methods and means in carrying out his work as will not cause any interruption or interference with any other Contractor.
- 34 NIGHT, SUNDAY OR HOLIDAY WORK: Sunday, work will be requiring the presence of a Town Employee or Inspector will be permitted on certain areas of the roadway with the prior

approval of the Superintendent.

- 35 REQUIRED POLICE OFFICERS: Uniformed police officers shall be in attendance when directed by the authorized representative of the Public Works Department and shall be reimbursed as directed herein.
- 36 REMOVAL OF POSTAL BOXES: Should it become necessary to require the temporary removal of any postal collection or relay boxes, in connection with construction, a telephone call should be made to the Postmaster, Norwood, MA at 762-0150, giving the location of the postal equipment forty-eight hours prior to the time the construction is to begin.
- 37 WORK BY OTHERS: The following items of work except as noted will be performed by others, and are not a part of this contract:
- 37.1 All underground or surface structures including boxes, frames and covers, etc., belonging to public utilities other than municipal will be adjusted to line and grade by the particular utility involved and it shall be the contractor's responsibility to notify all such utilities as the work progresses.
- 37.2 All power, light, and telephone poles will be removed and/or relocated by others.
- 37.3 All posting of trees designated for removal, etc., will be done by the Superintendent of Public Works.
- 38 TIME.
- 38.1 Construction is to begin no sooner than March 15, 2022. The project shall be completed no later than November 30, 2022
- 38.2 All proposed gas line work shall be completed between April 15th 2022 and November 15th 2022, unless otherwise approved by National Grid.
- 38.2 The rate of progress shall be regular and consistent and shall be such that the whole work shall be performed in accordance with the terms of this contract within the time of completion specified in the bid.
- 38.3 It is agreed that the rate of progress herein required has been purposely made low enough to allow for the ordinary delays incident to the seasonal as well as other difficulties of construction work of this character. No extension of time will be made for ordinary delays, inclement weather and accidents, and the occurrences of such will not relieve the contractor from the necessity of maintaining this rate of progress.
- 38.4 If delays are caused by acts of God, acts of Government or State, strikes, extra work, or other contingencies clearly beyond the control or responsibility of the Contractor, the Contractor shall be entitled to so much additional time wherein to perform and complete this contract on his part as the Superintendent of Public Works shall certify in writing to be just.
- 38.5 The Contractor shall promptly start the work to be done under this contract and shall continue it to completion with all the practical dispatch.
- 39 TIME OF COMPLETION: Construction is to begin no sooner than March 15, 2022. The project shall be completed no later than November 30, 2022
- 40 ACCESS TO WORK
- 40.1 The General Manager, the Superintendent of Public Works, agents, employees of the General Manager or Superintendent of Public Works, may, for any purpose, enter upon the work and premises used by the Contractor, and the Contractor shall provide safe and proper facilities therefore. The other agents, employees or Contractors of the Town may also, for all purposes which may be required by their work or contracts, enter upon the work, and any differences or conflicts which may arise between the Contractor and other workmen or contractors of the Town in regard to their work shall be adjusted by the Superintendent of Public Works.
- 40.2 The General Manager and the Superintendent of Public Works, agents, and employees of the General Manager or Town, may inspect at the point of manufacture any materials to be used in the work and reject such materials that are not satisfactory.
- 40.3 All material and workmanship shall be subject to inspection, examination, and test by the Superintendent of Public Works or representatives of the Superintendent of

Public Works at any or all times during construction.

- 41 DEFECTIVE WORK, APPROVALS, ETC. The inspection and/or approval of the work, or any part of the work, shall not relieve the Contractor of any obligation to fulfill this contract as prescribed. Defective work shall be made good and unsuitable materials and equipment may be rejected notwithstanding that such work, materials and equipment or drawings of same have been previously overlooked or approval by the Superintendent of Public Works and accepted or estimated for payment. If the work or part of it is found defective or unsatisfactory at any time before the final acceptance of the whole work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Superintendent of Public Works. If any materials brought upon the ground for use in the work, or selected for use, is condemned by the Superintendent of Public Works as unsuitable or not in the conformity with the specifications, the Contractor shall forthwith remove such materials from the vicinity of the work.
- 42 EMPLOYEES TO BE COMPETENT. The Contractor shall employ only competent people to do the work. If the Superintendent of Public Works notifies the Contractor that any one on the work is incompetent, unfaithful, disorderly or otherwise unsatisfactory, such one shall be discharged from the work on this contract and shall not again be employed on it, except with the consent of the Superintendent of Public Works.
- 43 NOT TO ASSIGN OR SUBLET. The Contractor shall give his personal attention to the faithful prosecution of the work, shall keep the same under this personal control. The Contractor shall not assign nor sublet the work or any part of it, without the previous written consent of the General Manager and shall not, either legally or equitably assign any of the monies payable under this agreement, or his claim thereto, unless by and with the consent of the General Manager.
- 44 ALTERATIONS AND EXTRA WORK. The Superintendent of Public Works may make the alterations in the line, grade, plan form, dimensions or materials of the work, or any part thereof, either before or after the commencement of construction; if such alterations diminish the quantity of work to be done, they shall not warrant any claim for damages or for anticipated profits on the work that may be dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done at the price stipulated for such work under this contract.
- 45 RESPONSIBILITY.
- 45.1 The Contractor shall take all responsibility of the work and take all precautions for preventing injuries to persons and property in or about the work. The Contractor shall in no way be relieved of his responsibility by any right of the Superintendent of Public Works to give such permission or issue such orders. Subject only to the provisions of G.L. C. 39N., if applicable, the Contractor shall bear all losses resulting to him on account of the amount or character of the work, or because the nature of the land in or on which the work is done is different from what was estimated or expected, or on account of the weather, elements or other cause. The Contractor shall assume the defense of and indemnify and save harmless, the Town and its officers, agents and servants, from claims relating to labor and materials furnished for the work; to inventions, patents, and patent rights used in doing the work; to injuries to any person or corporation or property received or sustained by or from the Contractor and his employees in doing the work, or in consequence of any improper materials or neglect of the Contractor and his employees herein.
- 46 ABANDONMENT OF WORK, ETC.
- 46.1 If the work to be done under this contract shall be abandoned, or if this contract or any part thereof shall be sublet, without the previous written consent of the General Manager, or if the Contract or any claim thereunder shall be assigned by the Contractor other than as specified herein, or if any time the Superintendent of Public Works shall be of the opinion, and shall so certify in writing to the General Manager that the conditions herein specified as to the rate or progress are not fulfilled or that the work or any part thereof, if unnecessarily or unreasonably delayed or that the Contractor has violated any of the provisions of this Contract, the General Manager may notify the Contractor to discontinue all work or any part thereof. Thereupon the Contractor shall discontinue such work or such part thereof as the General Manager may designate, and the General Manager may thereupon by contract or otherwise may have completed the work or any part thereof, and charge the entire expense of so completing the work or part thereof to the Contractor. For such completion the Town for itself or for its contractors may take possession of and use or cause to be used in completion of the work or part thereof any materials, machinery, implements, and tools of every description

as may be found upon the line of said work. All expenses charged under this article shall be deducted and paid by the Town out of any monies then due or to become due the Contractor under this contract, or any part thereof, and in accounting thereof the Town shall not be held to obtain the lowest figures for the work of completing the contract of any part therefor, or for insuring the proper completion, but all sums actually paid therefor, shall be charged to the Contractor. In case the expenses so charged are less than the sum which would have been payable under this contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference; and in case such expense shall exceed the said sum, the Contractor shall pay the amount of excess to the Town.

47 TWENTY-FIVE PERCENT CLAUSE.

47.1 The Town of Norwood reserves the right to increase or reduce the actual quantities of work under any item(s) in the contract, subject only the provisions of G.L. Chapter 30, §391, if applicable, so long as the increase or reduction does not affect the "Total amount of the bid based on Engineer's Estimate of Quantities" by more than twenty-five percent (25%).

47.2 The change in work shall be by a written order, and may be without notice to the sureties. The amount of compensation to be paid to the Contractor for any extra 0

47.2.1 By such applicable unit prices, if any, are set forth in the Contract, or by such unit prices as may be agreed upon between the Town and the Contractor;

47.2.2 If no such unit prices are set forth, or if no unit price is agreed upon between the Town and the Contractor, then by a lump sum mutually agreed upon by the Town and the Contractor, or;

47.2.3 If no such unit prices are to be set forth, or if no unit price is agreed upon between the Town and the Contractor, and if the parties cannot agree upon a lump sum then by the actual net cost in money to the Contractor of the materials and of wages of applies labor (including premiums for Workmen's Compensation Insurance) required for such extra work, plus such rental for plant and equipment (other than small tools) required and approved for such extra work, plus fifteen per cent (15%) as compensation for all other items of profit, and cost or expense including administration, overhead, superintendence, insurance (other than Workmen's Compensation Insurance), materials used in temporary structures, allowances made by the Contractor to subcontractors, additional premiums upon the performance bond of the Contractor and the use of small tools. The provisions hereof shall not affect the power of the Contractor to act in case of emergency as hereinafter provided.

47.3 If such increase or reduction of total quantities exceeds the "total amount of the bid based on Engineer's estimate of quantities " by more than twenty-five percent (25%), the Town of Norwood agrees that the contract has been substantially altered and will agree to renegotiate the unit prices for items in the contract.

48 CONTRACTOR CLAIMS. If the Contractor claims compensation for extra work not ordered, or for any damage sustained, he shall, within one week after the beginning of any such work or the sustaining of any such damage, make a written statement to the Superintendent of Public Works of the nature of the work performed or the damages sustained and shall, on or before the fifteenth day of the month succeeding that which in any such damage shall have been sustained, file with the Superintendent of Public Works an itemized statement of the details and amount of such work or damage; and unless such statements shall be made as so required, his claim for compensation shall be forfeited and invalid, and he shall not be entitled to payment on account of any such work or damage; and unless such statements shall be made as so required, his claim for compensation shall forfeited and invalid, and he shall not be entitled to payment on account of any such work or damage. The determination of the Superintendent of Public Works shall be final upon all questions of the amount and value of extra work, but in no greater amount than is approved in writing by the General Manager.

49 MONEY TO BE RETAINED. Subject only to the provisions of G.L. Chapter 30, §39G, if applicable, the Town may keep any monies which would otherwise be payable at any time hereunder, and apply the same, or as much as may be necessary therefor, to the payment of any expenses, losses or damages incurred by the Town and determined as monies as the General Manager shall be of opinion will be required to settle all claims against the Town, its officers, agents, or servants, specified in this Contract.

50 COMPENSATION TO BE PAID CONTRACTOR. The Town will pay and the Contractor will accept

in full consideration for the performance of the Contractor's obligations the amounts set forth in the bid in the quantities actually performed.

- 51 LAWS AND REGULATIONS. The Contractor shall keep himself fully informed of all state and national laws, and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work and of all such orders and decrees or bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the specifications or Contract for this work in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report the same to the General Manager in writing. He shall at all times himself observe and comply with, and shall cause all his agents and employees to observe and comply with, all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the Town and the General Manager and their officers and agents against any claim or liability arising from or based on the violations of any such law, ordinance, regulation, order or decree, whether by himself or his employees.
- 52 STATE AND FEDERAL REQUIREMENTS. All the materials furnished and work done are to comply with local, state and federal laws and regulations.
- 53 CONTRACTOR TO PAY ALL LABOR, ETC. The Contractor further agrees that he will pay for all labor performed or furnished, and for all material used or employed including lumber used on the project but not incorporated in the work, and for the rental or hire of vehicles, powers shovels, rollers, propelled by power, concrete mixers, tools and other appliances and equipment used or employed in the carrying out of this contract, and shall pay all persons who contract with the principle of labor and materials on account of the work herein contemplated and that he will furnish the General Manager at his request with evidence satisfactory to the General Manager that all persons who have done work or furnished anything under this contract and all claims of private corporation or individuals for damage of any kind caused by the construction of said work have been fully paid or satisfactorily secured and in case such evidence is not furnished the General Manager may cause to be retained out of any amount due the Contractor sums sufficient to cover any such unpaid claims. While it is understood that the security required to be given to the Contractor to satisfy the condition of statute law is furnished by his giving the bond accompanying this contract, the Town may nevertheless cause any monies retained or to become due to be held and applied to the payments for labor or materials for which security is required under the provisions of law. The provisions of this article are subject to the provisions of G.L. Chapter 149, §29, if applicable.
- 54 STATUTORY SECURITY PROVIDED ONLY BY BOND. It is expressly understood and agreed that all sums retained or that may be retained by the Town under any of the provisions of this contract are solely for the benefit of the Town and that the security required by Section 29, Chapter 149 of the General Laws, as amended, is furnished exclusively by the bond accompanying this contract.
- 55 PROGRESS ESTIMATES. The Superintendent of Public Works shall, once in each month, make an estimate in writing of the total amount of the work done at the expiration of the prior calendar month and the amount earned by the Contractor. The Town shall retain FIVE percent (5%) of such estimated value after the first fifty percent of the contract has been completed and paid, as part security for the fulfillment of this contract by the Contractor, and shall monthly pay to the Contractor, while carrying on the work, the balance not retained, after deducting therefrom all previous payments and all sums to be kept or retained under the provisions of this contract. Estimates of lump sum items shall be based on a schedule dividing each part such that the sum of the products or prices and quantities will equal the contract price for the item. The schedule shall be submitted by the Contractor for the approval of the Superintendent of Public Works before the first estimate becomes due. No such estimate or payment shall be required to be made, when in accordance with the provisions of this contract, or when the total value of the work done since the last estimate amounts to less than one thousand dollars (\$1000.00). Payment may at any time be withheld if the work is not proceeding in accordance with the contract. The Town may, if it deems expedient so to do, cause estimates and payments to be made more frequently than once in each month.
- 55.1 Payment will not be made for materials unless incorporated in the work.
- 55.2 The provisions of this article are subject to the provisions of G.L. Chapter 30, §39F, if applicable.
- 55.3 Whenever the work is substantially complete, the Town may, if it considers the amount retained to be in excess of the amount adequate for its protection and as required by statute, at its discretion, release to the contractor all or a portion of such excess amount, and may cause the contractor to be paid, temporarily or

permanently, from time to time such portion of the reserve as it deems prudent.

56 FINAL ESTIMATE AND PAYMENT.

56.1 When in the opinion of the Superintendent the Contract has been satisfactorily completed and final acceptance has been certified to the General Manager, the Contractor shall be informed in writing of the date of such acceptance, upon which date the Contractor's responsibility shall cease except as provided in his bond and as provided in this contract.

56.2 The Superintendent shall, as soon as practicable after the physical completion of the Contract, make a final estimate of the amount of work done thereunder and the value of such work. Within 65 days from and after the date the work has been accepted by the Town, the General Manager shall forward to the Contractor a copy of the final estimate or semifinal estimate as stipulated in Chapter 30, Section 39G of the General Laws, as amended together with an agreement form for his acceptance. After such acceptance has been filed with the General Manager, payments of the entire sum will be made, if found to be due thereunder after deducting therefrom all previous payments and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payment shall be subject to correction in the final estimate and payment. If within six months from the date the final estimate is forwarded to the Contractor, the Contractor has not filed with the General Manager a valid written reason for not accepting the final estimate, the final estimate will be considered acceptable to the Contractor and payment of the final estimate made.

57 PAYMENT OF FINAL ESTIMATE TERMINATES LIABILITY TO TOWN.

57.1 No person, firm, or corporation, other than the signer of this contract as Contractor, now has any interest hereunder, and no claims shall be made or be valid, and neither the Town, nor any agent of the Town, shall be liable for, or be held to pay any money, except as herein provided.

57.2 The acceptance by the Contractor of the payment of the final estimate, less the amount retained under the provisions of this contract, shall operate as and shall be a release to the Town, and every officer, agent, and employee of the Town, from any and all claim liability to the Contractor for anything done or furnished for or relating to the work, or for any act of neglect of the Town or of any person relating to or affecting the work, except the claim against the Town for the remainder, if any there be, of the amounts kept or retained as herein provided.

58 GUARANTY.

58.1 The Contractor guarantees that the work to be done under this contract, and the materials to be furnished by him for use in the construction of the same will be free from defects or flaws. This guaranty shall be for a period of one year from and after the date of the completion of the work as incorporated in the final estimate of the Superintendent of Public Works as herein above provided. The Contractor shall at all times within said period of guaranty keep the surface of the ground over this work, or adjacent thereto, in the position and condition required by this contract, and refill any settlement or erosion in the backfilling or any surface graded by him, due to any cause whatsoever, when so directed by the Superintendent of Public Works. Should he fail to do so, the Town may have said work done as described below.

58.2 If, at any time within the said period of guaranty any part of the work, constructed under the terms of this contract shall require repairing, the Superintendent of Public Works may notify the Contractor in writing to make the required repairs. If the Contractor shall neglect to make such repairs to the satisfaction of the Superintendent of Public Works within three (3) days from the date of giving or mailing such notice, or if the Superintendent of Public Works determine notifying the Contractor, then the Town may make or employ others to make the repairs. The owner shall pay the expense of the same out of the sum retained for that purpose as herein provided and if said sum be inefficient the Contractor shall promptly pay the balance to the Town.

58.3 Upon the expiration of the said period of guaranty, provided that the work at that time shall be in good order and repair, the Contractor shall be entitled to receive the whole or such part of said sum as may remain after the expense of making said repairs, in the manner aforesaid shall have been paid therefrom.

58.4 It is, however, agreed that the Town may keep the whole or a portion of the sum retained, for and until completion of the settlement of all claims arising out of

this contract against the Town, its officers, agents, or employees and for all expenses, losses, or damages incurred by the Town including attorney's fees and expenses by reason of said claims.

59 LEGAL ADDRESS. Both the address given in the bid upon which this contract is founded and the Contractor's office at or near the site of the work are hereby designated as places to either of which notice of letters, and other communications to the Contractor shall be certified, mailed or delivered. The delivering at the above-named place, or depositing in a post-paid wrapper directed to the first named place, in any post office box regularly maintained by the U.S Postal Service of any notice, letter or other communication to the Contractor, shall be deemed sufficient service thereof upon the Contractor, and the date of said service shall be the date of such delivery or mailing. The first named address may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor and delivered to the General Manager. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon the Contractor personally.

60 COMPLIANCE WITH CHAPTER 370 ACTS OF 1963. The Contractor shall furnish all notices and shall do all work and be responsible for all requirements of Chapter 370 of the Acts of 1963, entitled "An Act Requiring a Contractor Making An Excavation In A Public Way to Give Notice Thereof to Public Utility Companies."

61 STATUTORY PROVISIONS.

61.1 EMPLOYEES MAY SELECT LODGING, ETC. Every employee shall lodge, board, and trade where and with whom he elects; and no person or his agents or employees under contract with the Town shall directly or indirectly require as a condition of employment that the employee shall lodge, board, or trade at a particular place or with a particular person. G.L. C. 149, § 25.

61.2 EMPLOYMENT PREFERENCE. In the employment of mechanics and apprentice teamsters, chauffeurs, and laborers by the Contractor and subcontractors, preferences shall first be given to citizens of the Commonwealth who have been residents of the Commonwealth for at least six months at the commencement of their employment, who are male veterans as defined in clause forty-third of G.L. C. 4, § 7 and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the Commonwealth generally who have been residents of the Commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States. Preference shall be given to veterans and citizens who are residents of the Town. G.L. C. 149, § 26.

61.3 MINIMUM WAGE RATES. The minimum rates of wages to be paid mechanics and apprentices, chauffeurs teamsters, and laborers shall be as set forth in the schedule of rates of wages determined by the Commissioner of Labor and Industries, which schedule is attached hereto and made part hereof. G.L. C.149, § 27.

61.4 EIGHT-HOUR DAY. No laborer, workman, or mechanic in the employ of the Contractor, and subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day, except in cases of emergency and as provided in M.G.L. c.149, § 34.

61.5 WORKMEN'S COMPENSATION. The Contractor shall, before commencing performance of the contract, provide by insurance for the payment of compensation and the furnishing of other benefits under G.L. c. 152 to all persons to be employed under the contract, and shall continue such insurance in full force and effect during the term of the contract, all in accordance with G.L. c. 149, § 34A.

61.6 PAYMENT TO SUBCONTRACTORS. Every contract awarded pursuant to Section 44A to L, inclusive, of Chapter 149 shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to Section 39M of Chapter 30 shall contain the following subparagraph (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 the 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 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 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 has already been 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 the 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 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 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 the 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 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 the 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 subcontractor and shall notify the general contractor 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 accounts in a bank pursuant to subparagraph (f) shall be made out of the amounts payable to the general contractor at the time of the receipt of a demand for direct payment from a subcontractor and out of the amounts which later become payable to the general contractor and in the order of receipts of such demands from subcontractors. All direct payments shall discharge the obligation of the Awarding Authority to the general contractor to the extent of said 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 the 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 paragraph. 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 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 periodic estimate from the general contractor. Thereafter the Awarding Authority shall proceed as provided in subparagraph (e), (f), (g), and (h). G.L. C. 30, s. 39F.

61.7 RESERVE POLICE OFFICERS. The Contractor shall pay to any reserve police officer employed by it in the Town the prevailing rate of wage paid to regular police officers in the Town and as set forth in the payment item included in this contract. G.L. C.149, § 34B.

61.8 CHANGE ORDERS. The Contractor shall perform all work required by the contract in conformity with the plans and specifications contained therein. No willful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the Awarding Authority or by the Superintendent of Public Works. In order to avoid delays in the prosecution of the work required by the contract, such deviation from plans or specifications may be authorized by a written order of the Awarding Authority or an individual 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 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 or perjury and shall be a permanent part of the file record of the work contractor for.

61.9 "OR EQUAL CLAUSE." An item equal to an item described or named in the specifications may be furnished. An item shall be considered equal to the item so named or described if: (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 work; and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the specifications. G.L. C. 30, § 39M.

61.10 SUBSURFACE CONDITIONS. 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 different 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 adjustment the contract price and the contract shall be modified in writing accordingly.

61.11 SUSPENSION OF THE WORK.

61.11.1 The Awarding Authority may order the 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 the contract, 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 provision.

61.11.2 The Contractor must submit the amount of a claim under the provision above 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 in writing of the act or failure to act involved in the claim. G.L. Chapter 30, §390.

61.12 PRICE ADJUSTMENT

61.12.1 Notwithstanding any general or special law to the contrary, all construction contracts funded in whole or part by the funds authorized by Chapter 303, Section 60, Chapter 30 Section 38A, or by Chapter 86 shall include a price adjustment clause for liquid asphalt, Portland cement, diesel fuel, gasoline, structural steel, and reinforcing steel prices. The contract adjustment shall be made on a monthly basis when the monthly change exceeds +/- five (5) percent. The base price for this contract, based upon the MassDOT website as of December 15, 2021 shall be \$625.50 per ton for liquid asphalt, TBD/gallon for diesel fuel, TBD/gallon for gasoline, TBD for steel PPI and \$162.28 per ton for Portland cement.

62 TERMINATION AND DEFAULT

62.1 Without Cause. The Town may terminate this Contract on seven (7) calendar days notice when in the best interests of the Town by providing notice to the Contractor, which shall be in writing and shall be deemed delivered and received when given in person to the Contractor, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the Contractor. Upon termination without cause, Contractor will be paid for services rendered to the date of termination.

62.2 For Cause. If the Contractor is determined by the Town to be in default of any term or condition of this Contract, the Town may terminate this Contract on seven (7) days notice by providing notice to the Contractor, which shall be in writing and shall be deemed delivered and received when given in person to the Contractor, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the Contractor.

62.3 Default. The following shall constitute events of a default under the Contract:

- 1) any material misrepresentation made by the Contractor to the Town; 2) any failure to perform any of its obligations under this Contract including, but not limited to the following: (i) failure to commence performance of this Contract at the time specified in this Contract due to a reason or circumstance within the Contractor's reasonable control, (ii) failure to perform this Contract with sufficient personnel and equipment or with sufficient material to ensure the completion of this Contract within the specified time due to a reason or circumstance within the Contractor's reasonable control, (iii) failure to perform this Contract in a manner reasonably satisfactory to the Town, (iv) failure to promptly re-perform within a reasonable time the services that were rejected by the Town as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the Contractor's reasonable control, (vi) failure to comply with a material term of this Contract, including, but not limited to, the provision of insurance and non-discrimination, (vii) any other acts specifically and expressly stated in this Contract as constituting a basis for termination of this Contract, and (viii) failure to comply with any and all requirements of state law and/or regulations, and Town bylaw and/or regulations.

63 The Contractor's Breach and the Town's Remedies:

Failure of the Contractor to comply with any of the terms or conditions of this Contract shall be deemed a material breach of this Contract, and the Town of Norwood shall have all the rights and remedies provided in the Contract documents, the right to cancel, terminate, or suspend the Contract in whole or in part, the right to maintain any and all actions at law or in equity or other proceedings with respect to a breach of this Contract, including damages and specific performance, and the right to select among the remedies available to it by all of the above.

From any sums due to the Contractor for services, the Town may keep the whole or any part of the amount for expenses, losses and damages incurred by the Town as a consequence of procuring services as a result of any failure, omission or mistake of the Contractor in providing services as provided in this Contract.

64 COVID-19 Employee Health, Protection, Guidance, and Prevention

It shall be the responsibility of the successful bidder to follow the Commonwealth of Massachusetts' guidelines and procedures as published on its website as it pertains to COVID-19 and construction projects.

SECTION D - PROJECT SPECIAL PROVISIONS

SPECIAL PROVISIONS

Norwood

Proposed Bridge Replacement - Westover Parkway over Germany Brook (N-25-034) (C9P)

SCOPE OF WORK

The project includes a proposed bridge replacement consisting of removing the existing steel arch and stone headwalls, and replacing it with a 3-sided precast culvert supported on cast-in-place concrete spread footings. Adjacent to the proposed culvert will be cast-in-place concrete wingwalls to retain the roadway grades. Wingwalls will be placed with an aesthetic form liner finish, to match existing aesthetics. The 4" gas line that passes over the existing culvert will be relocated to be hung from the east wingwalls. The phasing of the gas line relocation work shall be closely coordinated with National Grid. Streambed restoration is proposed within Germany Brook to provide a natural stream bottom within the proposed structure. The project also provides bridge rail improvements, guardrail improvements on the east side of Westover Parkway, granite curbs on both sides of the road, a reconstructed sidewalk, and a resurfaced roadway with new pavement markings within the limit of work. Generally, the proposed roadway features and dimensions will closely match existing conditions.

The work also includes excavation, granite curbing, landscaping, restoring abutter's light pole/electrical service, and other incidental work.

All work under this Contract shall be done in conformance with the Standard Specifications for Highways and Bridges dated 2021, the 2017 Construction Standard Details, the 1990 Standard Drawings for Signs and Supports; the 1996 Construction and Traffic Standard Details (as relates to the Pavement Markings details only); The 2015 Overhead Signal Structure and Foundation Standard Drawings, the 2009 Manual on Uniform Traffic Control Devices (MUTCD) with Massachusetts Amendments and the Standard Municipal Traffic Code; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of American Standard for Nursery Stock; the Plans and these Special Provisions.

WORK SCHEDULE

The Contractor shall perform all work in accordance with Norwood standard work hours for construction as follows: Monday through Friday (Excluding Holidays) 7:00 AM to 3:00 PM

The Contractor and any subcontractors shall only work overtime as approved by the Town. The Contractor shall coordinate with the Town and Norwood Police Department to obtain a waiver if work on Saturdays, Sundays or Holidays is necessary.

DESIGNER/PROJECT MANAGER

DESIGNER
TEC, Inc.
Andrew Spurr, P.E.
(978) 794-1792

ARCHITECTURAL ACCESS BOARD TOLERANCES

The Contractor is hereby notified that they are ultimately responsible for constructing all project elements in strict compliance with the current AAB/ADA rules, regulations and standards.

All construction elements in this project associated with sidewalks, walkways, wheelchair ramps and curb cuts are controlled by 521CMR - Rules and Regulations of the Architectural Access Board (AAB).

The AAB Rules and Regulations specify maximum slopes and minimum dimensions required for construction acceptance. There is no tolerance allowed for slopes greater than the maximum slope nor for dimensions less than the minimum dimensions.

PROTECTION OF UNDERGROUND FACILITIES

The Contractor's attention is directed to the necessity of making his own investigation in order to assure that no damage to existing structures, drainage lines, traffic signal conduits, etcetera, will occur.

The Contractor shall notify Massachusetts DIG SAFE and procure a Dig Safe Number for each location prior to disturbing existing ground in any way. Contact the Dig Safe Call Center by dialing 811 or 1-888-344-7233 or online at www.digsafe.com.

The Contractor's attention is drawn to the potential underground electrical features at the abutting property (28 Westover Parkways), which may be impacted by excavation. Contractor shall coordinate all work in this area with the property owner.

TEMPORARY ACCESS TO RESIDENTS

The Contractor shall provide safe and ready means of ingress and egress to all driveways, businesses or residences in the project area, both day and night, for the duration of the project.

The Contractor shall minimize the duration of impacts to private property. The Contractor shall provide private property owners with a minimum of two weeks' notice prior to performing work that will affect access to private property

TRAFFIC CONTROL

The Contractor shall conform and be prepared to setup the required traffic control as noted in the Plans. The Contractor will be required to implement the detour plan as shown in the Plans. The detour should be Coordinated with both the Town and Police Department.

NOTICE TO OWNERS OF UTILITIES (Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or municipal and State officials owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one week in advance of the commencement of such operations. The Contractor shall, at the same time, file a copy of such notice with the Town and the Engineer.

Before commencing work on service connections, the Contractor shall be responsible for contacting the Electric Company servicing the area to obtain construction requirements, standards, and to give adequate notice of commencement of work. The Contractor's attention is further directed to the requirements of work in the immediate vicinity of certain underground structures and poles herein included in these Special Provisions.

A list of public and private utilities can be found on the MassDOT website at:

<https://hwy.massdot.state.ma.us/webapps/utilities/select.asp>

Select District 5 on top of the webpage, select the City/Town (NORWOOD), and then locate the utility.

The Contractor shall inform the following officials in each area that he assigned to work:

Superintendent, Department of Public Works or Town Engineer,
Superintendent, Water Department,
Superintendent, Sewer Department,
Police and Fire Department,
Electric Department

Town officials are shown at website <https://www.mass.gov/lists/massachusetts-city-and-town-websites> under:

Select "N" from the Table of Contents

Select "Norwood"

The official Municipality Home Page will load.

The following are the names of owners and representatives of the principal utilities in

Town, but completeness of this list is not guaranteed by the Department. Not all utilities listed below will be impacted by this project:

Norwood Light (Electric) 206 Central Street Norwood, MA 02062	Jim Collins 781-762-3203
National Grid Gas 40 Sylvan Road Waltham, MA 02451	Melissa Owens 781-907-2845 Melissa.Owens@nationalgrid.com
Enbridge 8 Wilson Way Westwood, MA 02090	Kathy Aruda 508-938-7728 kathleen.aruda@enbridge.com
Verizon 385 Myles Standish Blvd. Taunton, MA 02780	Karen Mealey 508-828-6437 karen.m.mealey@verizon.com
Norwood DPW-Eng. (water) 1 Lyman Place Norwood, MA 02062	Mark Ryan 781-762-1420
MWRA (Water) 2 Griffin Way Chelsea, MA 02150	Ralph Francesconi 617-305-5827
Norwood DPW-Eng. (Sewer) 1 Lyman Place Norwood, MA 02062	Mark Ryan 781-762-1420
MWRA (Sewer) 2 Griffin Way Chelsea, MA 02150	Kevin McKenna 617-305-5827
MWRA (Sewer) 2 Griffin Way Chelsea, MA 02150	Kevin McKenna 617-305-5827
Comcast Cable Corp. PO Box 6505 5 Omni Way Chelmsford, MA 01824	Wendy Brown 978-848-5163 Wendy_Brown@comcast.com
Crown Castle 80 Central Street Boxborough, MA 01719	Mark Bonanno 508-616-7818 mark.bonanno@crowncastle.com
Norwood Broadband 206 Central Street Norwood, MA 02062	Darryl Hanson 781-762-3203
Norwood Light (Fire Alarm) 206 Central Street Norwood, MA 02062	Jim Collins 781-762-3203
Century Link 1025 Eldorado Blvd Broomfield, CO 80021	Renoy Thomas 516-712-3041 CenturyLinkNationalOspRelations@centurylink.com
AT&T / Teleport Comm. America 50 Mall Road-Suite 203 Burlington, MA 01803	Hayleigh Walker 781-221-8400 Haleigh.Walker@sienaengineeringgroup.com

GENERAL

Work under this item shall include all work associated with the temporary removal, and complete replacement of the lighting fixture located within the anticipated limits of excavation required to construct the bridge.

The light fixture, as shown on the Plans, is located on property owned by abutters at 28 Westover Parkway, Norwood MA. Based on the anticipated limits of excavation, the light fixture and electrical service may be disturbed during construction. The Contractor shall closely coordinate with the Town of Norwood and the abutters to ensure that they are aware of the work to be performed on their property.

All earthwork (including trenching, backfilling, compacting, etc.), loam and seed, light fixtures, electrical work, labor, etc. required to temporarily remove and completely restore the service of the light fixture, shall be considered incidental to this Item.

After the bridge conveying Germany Brook is installed, and the bridge is backfilled to the appropriate elevation, the Contractor shall replace the lighting fixture and restore any disturbance related to the lighting fixture. At a minimum, the lighting fixture to be installed shall match what is in place before earth is disturbed. The Contractor shall consult the Town of Norwood and the abutters to ensure that all proposed procedures and materials are acceptable.

All work associated with the temporary removal and complete replacement of the lighting fixture shall be included in the bid price for this Item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 100.59 shall be measured for payment and paid for at the Contract Unit LUMP SUM Price for the temporary removal and complete replacement of the light fixture. The price shall include all labor, materials, equipment, and incidental costs required to complete the work stated above.

GENERAL

Work under this item shall conform to the relevant provisions of Section 148 of the Standard Specifications and the following:

The work under this item shall include dredging of approved native streambed material to be stockpiled for re-use as shown on the Plans and as directed by the Engineer.

Streambed material may be stockpiled on site at a location determined by the Contractor. The stockpiled material will be reused on site for streambed restoration.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

All work required to dredge and stockpile the streambed material shall be included in the bid price for this Item 148.01. Any streambed material that will be dredged and disposed of, shall be included in the bid price for Item 148.

Item 148.01 shall be measured for payment based on the volume (CUBIC YARD) of material dredged and stockpiled. Pay limits extend from the bottom of proposed excavation to the top of the existing streambed as shown on the Plans.

Item 148.01 shall be paid for at the Contract Unit Price per CUBIC YARD of material dredged and stockpiled as measured above. The price shall include all labor, tools, equipment, and materials necessary to dredge and stockpile the existing streambed material on site.

The re-placement of the stockpiled material shall be included in the bid price for Item 983.521 - Streambed Restoration

GENERAL

Work under this Item shall conform to the relevant provisions of Section 670 of the Standard Specifications and the following:

Work under this Item shall include installation, maintenance, and removal of a temporary floating silt fence to prevent any sediment disturbed during construction from reaching adjacent waterways and to prevent any further sediment dispersion into the Germany Brook. This fence shall be installed downstream of the existing culvert, as shown on the Plans.

Work under this Item shall include installation, maintenance and removal of a temporary floating silt fence acting as an aquatic life barrier from the inlet to the dewatering pump at the upstream end of the culvert. The fence shall be installed in the channel, upstream of the dewatering pump, as shown on the Control of Water Plan.

MATERIALS

Floating silt fence shall be made of a woven polypropylene with a minimum 200 lb. tensile strength. The Contractor shall submit to the Engineer, for review and approval, product specifications and technical data provided by the manufacturer, prior to installation. The fence shall be continuously weighted at the bottom to maintain a vertical submerged position. Anchors shall be placed at both ends of the curtain and at intermediate locations, as necessary, to hold the fence securely in place. The fence shall be installed to withstand the forces of the flow of the waterway.

INSTALLATION

Floating silt fence shall be installed before construction begins and earth is disturbed. Silt fences shall be inspected and approved by the Town of Norwood Conservation Commission after installation and prior to commencement of further construction activities.

The silt fence at the upstream end of the culvert acting as an aquatic life barrier shall be installed as to prevent passage of aquatic life during dewatering. The fence shall extend to the channel bottom and shall be continually anchored so no fish are able to pass beneath

The Contractor shall inspect the silt fence weekly to ensure continuous effectiveness. The Contractor shall always maintain the intent of the fence by making any/all necessary adjustments, should the need arise. If any part of the fence becomes damaged or dislodged, construction activities shall be halted until all deficiencies are corrected by the Contractor with no additional compensation. The floating silt fence shall be removed after all construction activities are completed and in such a way that no collected sediment is dispersed into waterways.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 697.2 shall be measured for payment and paid for at the Contract Unit Price per FOOT of floating silt fence installed. This item shall include full compensation for all labor, equipment, maintenance, materials, and incidentals required to complete the work for the duration of the Contract.

GENERAL

Work under this Item shall conform to the relevant provisions of Section 670 of the Standard Specifications along with the following:

The work under this item shall consist of furnishing and placing of geotextile fabric for stabilization at the locations shown on the Plans or as directed by the Engineer.

This work shall include the installation of geotextile fabric for all areas beneath proposed footings, and beneath all riprap embankments, as indicated on the Plans. A layer of fabric shall be installed between the natural, undisturbed soil and the proposed crushed stone underlying all footings. A layer of fabric shall also be placed between the backfilled embankment slopes and the rip rap.

The geotextile fabric shall be handled and installed per the manufacture's recommendations.

MATERIALS

The geotextile fabric shall be a product from the MassDOT Qualified Construction Materials List and conform the MassDOT Standard Specifications section M9.50.0.

The Contractor shall submit proposed fabric to the Engineer for review and approval.

METHODS

Atmospheric exposure of the geotextile fabric to the elements following lay down shall be limited to a maximum of 14 days.

Geotextile shall be placed in intimate contact with soils without wrinkles or folds and shall be anchored on a smooth graded surface approved by the Engineer. The geotextile shall be placed in such a manner that placement of the overlaying materials will not excessively stretch or tear it.

Adjacent geotextile sheets shall be joined by either sewing or overlapping. At roll ends, overlapped seams shall overlap a minimum of 12 inches, except when placed under water, where they shall overlap a minimum of 3 feet. Adjacent rolls shall overlap a minimum of 12 inches.

Care shall be taken during installation to prevent damage to the geotextile as a result of the installation process. Should the geotextile be damaged, a geotextile patch shall be placed over the damaged area extending a minimum of 3 feet beyond the limits of the damage.

Any section of fabric that is damaged shall be repaired in accordance with the manufacturer's requirements and AASHTO M 288 and to the satisfaction of the Engineer or it shall be replaced at the Contractor's expense.

If during construction, including any time prior to final acceptance of the project by the Engineer, the riprap embankment slopes shall exhibit signs of failure, the slope shall be repaired and the geotextile fabric reinstalled or replaced by the Contractor, as required by the Engineer, at Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

All work required to install geotextile fabric for stabilization along with all work stated above shall be included in the bid price for this Item 698.1.

All work described under Item 698.1 shall be measured for payment by the SQUARE YARD as shown on the Plans or as directed by the Engineer. Overlapping for seams and joints shall be measured as one layer of fabric. Any embedment or wrapping at the toe or top of slope, applied per manufacturer's installation recommendations or the Engineer direction shall be measured for payment.

Item 698.1 shall be paid for at the Contract Unit Price per SQUARE YARD, which shall include all labor, equipment, materials, and incidentals required to complete the work stated above, as indicated on the Plans.

GENERAL

Work under this item shall conform to the relevant provisions under Section 828 and Section 840 of the Standard Specifications and the following:

The Contractor shall carefully remove and reset all signs as shown on the plans. Removal and resetting shall include all attachment hardware and sign support posts.

Work shall include the dismantling, removal, transporting, storing, and resetting of existing traffic signs at the locations shown on the plans. If an existing sign and/or post are not suitable for reuse, as determined by the Engineer, the Contractor shall furnish a new sign and/or post as described in the Standard Specifications. New attachment hardware shall be furnished as necessary to replace any missing or unusable existing hardware.

Any existing sign and/or post damaged by the Contractor's operations shall be replaced in-kind by the Contractor at the Contractor's expense.

Included under this item are warning, regulatory, route marker and miscellaneous signs.

The Contractor shall backfill with compacted gravel all holes resulting from the removal of the existing signs and their foundations and restore the area to match existing conditions of adjacent areas.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 734. shall be measured for payment and paid for at the Contract Unit Price per EACH sign removed and reset complete in place. Payment shall constitute full compensation for dismantling, loading, transporting, and resetting of the signs as designated above, backfill and any incidental costs required to complete the work.

GENERAL

The work under this Item consists of installing an aesthetic formliner on all wingwalls.

The outward facing concrete surfaces shall have an aesthetic formliner applied to match the existing appearance to the greatest extent practical. The limits of the formliner shall be the minimum area specified on the Plans. The formliner used shall be one of the products listed below or approved equal. If an approved equal is to be used, the Contractor shall submit the desired pattern for review and approval. The Contractor shall apply the formliner to a test area of concrete prior to and provide photos to the Engineer for review and approval.

1. Customrock FormLiner: V-Lite, Random Stone Pattern.
Manufactured by Custom Rock Formliner: 2020 West 7th Street St. Paul, MN 55116
2. Symons by Dayton Superior Styrene/ABS Plastic
Formliner: Random Field Stone Large Pattern. Manufactured by Dayton Superior 1125
Byers Road Miamisburg, OH 45342
3. GrayLastic Elastomeric Formliner, 16985 Indiana River
Rock - Random Cobble Stone Pattern. Manufactured by Fitzgerald Formliners 1500
East Chestnut Ave, Santa Ana, CA 92701

A color coating shall be applied to resemble the color of the existing stone wall (see manufacturer's literature for terms).

Once a system is agreed upon, the Contractor shall perform all work in strict adherence with manufacturer's specifications and recommendations.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

All work required to complete installation of the wingwall formliner shall be included in the bid price for Item 899. All work described under Item 899. shall be measured for payment by the SQUARE FOOT as shown on the Plans or as directed by the Engineer.

Item 899. shall be paid for at the Contract Unit Price per SQUARE FOOT, which shall include all labor, equipment, materials, and incidentals required to complete the work stated under Item 899., as indicated on the Plans.

GENERAL

Work under this item shall conform to the relevant provisions under Section 983 of the Standard Specifications and the following:

In accordance with the Order of Conditions issued by the Town of Norwood Conservation Commission, the dumped riprap embankments in front of the wingwalls shall be vegetated above the delineated wetlands (upland of the natural bank). The locations for vegetating the dumped riprap stone shall be confirmed in the field by the Engineer, prior to seeding.

At the locations identified for vegetation, the Contractor shall install a New England semi-shade grass and forbs mix over compost. Seed shall be placed at a rate of 1 LB / 1450 SF of ground surface to be vegetated. After compost and seed have been placed, Contractor shall apply a layer of leaf compost over the seeded areas. Leaf compost shall be placed so that settled material is at or slightly below surface plane of underlying stones and applied at a rate of 0.2 CY / SY of ground surface vegetated. All compost material, seed, leaf compost, labor, etc. or other materials required to provide a vegetated embankment shall be considered incidental to this Item.

This Item also includes the dumped riprap to be installed within the culvert and channel, however since these locations are not upland of the natural bank, they do not need to be vegetated as described above.

Crushed stone and geotextile fabric to be installed below the dumped riprap stone are considered elsewhere in this Contract and are not included in this Item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

All work described under Item 983. shall be measured for payment by the TON of dumped riprap installed as shown on the Plans or as directed by the Engineer.

Item 983. shall be paid for at the Contract Unit Price per TON, which shall include all labor, equipment, materials, and incidentals required to complete the work stated under Item 983., including vegetating the embankment slopes in front of the wingwalls.

GENERAL

The work under this item shall include performing streambed restoration using existing material stockpiled during dredging operations at locations and grades as indicated on the Plans, as stipulated herein, and/or as required by the Engineer.

The streambed restoration material is to be placed within the 3-sided cement concrete box culvert and the immediate upstream and downstream area as depicted on the plans. The intent of this item is to replicate within the culvert area, a stream environment that matches the existing condition prior to excavation and is similar to the existing stream adjacent to the work area while providing a stable streambed under extreme flood conditions.

MATERIALS

The streambed restoration within the barrel of the culvert shall be comprised of 12 inches of natural streambed material, previously dredged from the surrounding area and stockpiled. The dredging and stockpiling of materials will be paid for under Item 148.01 - Dredging and Stockpiling of Material. Additional graded materials, described below, may be used to improve the stability during high-velocity storms.

The natural streambed material shall be placed on top of a layer of dumped riprap (as detailed on the Plans) which shall be paid under Item 983 - Dumped Riprap.

METHODS**Streambed Placement**

The placement of the top layer of streambed material under this item shall not begin until the Engineer approves the underlying layer of dumped along the culvert. The Contractor shall place the streambed material that was previously dredged and stockpiled under Item 148.01 and re-place said material to the limits specified herein and as shown on the Plans.

All excess streambed material that is not for re-use shall be properly disposed of and included in the bid price for Item 148. - Dredging and Disposing of Material.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 983.521 - Streambed Restoration shall be measured for payment by the CUBIC YARD within the specified limits shown on the Plans or as directed by the Engineer.

All work required to re-place/re-install the streambed material previously dredged and stockpiled on site shall be paid for at the Contract Unit Price per CUBIC YARD, which shall include all labor, materials, equipment, and incidental costs required to complete the work specified herein or as shown on the plans or as directed by the Engineer.

The dredging and stockpiling of materials shall be paid for separately under item Dredging and Stockpiling of Material, 148.01. The dredging and disposal of material shall be included in the bid price for Item 148.

GENERAL

All work to be done under this Item shall conform to the relevant provisions of Sections 140.60 of the Standard Specifications, the Plans and the following:

The work under this Item shall consist of all dewatering necessary to control water during the construction of the proposed culvert and wingwalls. Water shall be diverted and controlled in such a way that the existing culvert is removed and the proposed culvert/wingwall construction is completed completely in the dry.

The control of water system neither shall cause the accumulation of siltation nor any adverse effect to the water or the environment.

The temporary control of water systems shall be non-permanent, and cause no harm to the ecology of the Germany Brook, land under water, and surrounding land and shall be comprised bulk sand bags or portable cofferdams or other approved impervious curtains, and dewatering to facilitate construction activities. Operations of control of water shall not adversely affect the quality of the required construction. Contractor shall install both floating silt fences (upstream and downstream of the culvert) prior to dewatering, in accordance with Item 697.2 - Floating Silt Fence.

As part of the work under this Item, it is the responsibility of the Contractor to determine the need and extent of dewatering required. Special care shall be given to minimize disturbance to the stream and adjacent banks. All in-stream work shall take place during low flow periods, in accordance with the Order of Conditions issued by the Norwood Conservation Commission.

SUBMITTALS

Prior to the commencement of any work at the site, the Contractor shall submit to the Engineer for review and approval, a detailed plan for water control, including the construction of the water control system, and a footing placement sequence plan with a timetable and details specific to each of the phases of construction in relation to the control of water system. The submittal shall include working drawings, calculations, detailing the methods and materials proposed to account for all anticipated loads and construction conditions necessary to permit the work while maintaining a safe work area and protecting adjacent abutter property from damage.

Any drawings and calculations prepared as part of the submittal must be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.

The Contractor's attention is directed to the Order of Conditions issued by the Norwood Conservation Commission included herein, for additional environmental constraints that must be adhered to when designing and installing the control of water system.

The Control of Water Plan shall include a Sedimentation and Erosion Control Plan and a Water Flow Diversion and Containment Plan. The plans shall be in adequate detail to define specifics regarding materials, sizes, connections, and incidental items associated with the work. The furnishing of such plans shall not serve to relieve the Contractor's responsibility for the safety of the work or his/her responsibility for the successful completion of the project. The proposed plans submitted shall be designed and stamped by a Professional Engineer in the Commonwealth of Massachusetts. The Contractor's attention is directed to the Order of Conditions included herein, for additional information on submittal requirements.

The Contractor shall make his/her own evaluation of existing conditions, groundwater level, water flow, the effects of his/her proposed temporary works and construction methods and shall provide in his/her design for all loads and construction conditions necessary to permit construction of the specified structures while maintaining public safety and protecting completed work and all third-party property from damage due to the operations to be performed.

Sedimentation and Erosion Control Plan:

The Contractor shall submit to the Engineer, plans and details of the intended sedimentation/retention tank system that will be used along with dewatering techniques, and its location at the bridge site. All discharge resulting from dewatering activities

ITEM 991.2 (CONTINUED)

shall be directed to temporary sedimentation/retention tank at locations approved by the Engineer. At no time shall said discharge be directly released into the Germany Brook. The proposed plan shall include methods and equipment necessary to discharge water from the sedimentation treatment basins. Sedimentation/retention tank shall be sized appropriately to adequately dewater from the proposed work zone while allowing sufficient time for sediments to settle out of the water, and with a depth such that a minimum of 18 inches of freeboard is maintained throughout its use.

Water Flow Diversion and Containment Plan:

The Contractor shall submit plans and details along with a complete description showing any proposed systems for control of water and dewatering plan to the Engineer for his approval prior to the start of the work. The proposed plan shall include methods and equipment necessary to perform the work and shall include water discharge methods and equipment to bring water from the work zone to sedimentation/retention tank.

METHODS

This work shall also include dewatering the work areas as needed to complete demolition and construction in the dry.

The system shall be designed so that there are no adverse effects on the adjacent properties. The control of water system shall be sized in such a way that the system is overtopped with elevated stream water before any adjacent properties are inundated.

Where sandbags are used, the bags shall not decay nor rip or tear during the installation, its service life within the Germany Brook, or during the removal process. The Contractor shall not disturb the streambed to avoid migration of silts and sands further downstream. All in-stream work required to install, adjust, and remove the control of water system must be performed by hand or by hoisting equipment positioned upland.

Measures to control the discharge of sediment or pollutants into the water resource areas shall include, but not be limited to the following:

1. Site construction areas outside the buffer zones and on relatively flat ground.
2. Management of construction operations involving hazardous materials, such as refueling and maintenance of equipment within the resource areas.
3. Installation and continuous maintenance of water control measures throughout the project.
4. Treatment of all discharge resulting from dewatering activities through a sedimentation/retention tank to control turbidity. At no time shall the discharge from dewatering activities be directly released into a resource area.
5. Perform as much work as possible outside the stream banks.

The locations of any sedimentation/retention tank will be determined by the Contractor based on the selected methods of construction. Placement of the tank shall be in an upland area that is within the existing right of way.

If necessary, a sumping basin shall be constructed to collect any stream waters able to bypass the diversion system that may enter any work areas. The basin shall be equipped with a pump to convey waters to a sedimentation/retention tank. Water shall be pumped across the street to be discharged downstream once passing through the sumping basin and sedimentation/retention tank. No waters pumped from the work areas shall be discharged back to the stream until sediment is filtered using the sedimentation/retention tank.

All dewatering and related water control work shall be conducted in such a manner as to prevent siltation or contamination of the waterway. At a minimum, the sedimentation/retention tank shall be constructed of an earthen berm lined with geotextile fabric and surrounded by staked hay bales. The tank shall meet or exceed the following criteria:

1. The size and location of the tank shall be determined based on the size of the Contractor's pump and the anticipated groundwater levels.
2. The outlet/weir of the sedimentation/retention tank shall not cause erosion of the surrounding area. An approved method of controlling erosion, such as an erosion

ITEM 991.2 (CONTINUED)

control blanket, stone, etc., shall be used at the outlet of the tank.

3. The Contractor shall not allow any sediment within the sedimentation/retention tank to accumulate to a depth of greater than 12 inches at any point in the tank, nor shall the water level be allowed to rise to a height of more than 24 inches.
4. The sedimentation/retention tank shall be designed with a minimum of 18 inches of freeboard, which must be maintained at all times.
5. The Contractor shall inspect the sedimentation/retention tank at least daily when in operation.
6. Damages shall be repaired immediately.
7. The sedimentation/retention outlet shall be cleaned daily.
8. The sediments within the sedimentation/retention tank shall be disposed of as described in the Order of Conditions or as approved by the Engineer.

Upon completion of water control, the materials and equipment used to maintain the control of water system, sumping basin, and sedimentation/retention tank shall become the property of the Contractor and shall be removed by the Contractor from the site. The area affected shall be restored to its natural condition in a manner subject to the Engineer's approval.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 991.2 Control of Water - Structure No. N-25-034 (96H) will be measured for payment by the LUMP SUM, complete in place.

Item 991.2 Control of Water - Structure No. N-25-034 (96H) shall be paid for at the Contract Unit Price per LUMP SUM, which shall include all labor, equipment, materials, and all incidentals required to complete the work.

No separate payment will be made for engineering or any adjustments and repositioning of the control of water, but all costs in connection therewith shall be included in the Contract Unit Price for bid.

Half (50%) of the cost shall be paid when the implementation and dewatering processes begin, the other half (50%) of the cost shall be paid after the control of water system is fully removed.

The work under this Item shall conform to the applicable provisions of Section 995 of the Standard Specifications and the specific requirements stipulated below for component parts of this Item. For those component parts where no specific requirement is stipulated, the 2021 MassDOT Standard Specifications shall apply, except for payment.

Work under this Item shall include all materials, equipment and labor needed to construct the following:

- Three-sided precast concrete culvert
- Precast concrete guardrail transitions/endposts
- Cast-in-place culvert footings
- Cast-in-place concrete wingwalls (footings and wall stems)
- Cast-in-place concrete approach slabs
- Cast-in-place concrete apron
- Epoxy coated reinforcing steel
- Structural steel for utility supports
- Membrane waterproofing
- Bituminous damp-proofing
- Metal bridge railing (S3-TL4)

The work does not include any items listed separately in the proposal. Payment for materials shown on the Plans as being part of the bridge structure or which may be incidental to its construction and are not specifically included for payment under another Item shall be considered incidental to the work performed under this Item and shall be included in the unit price of the component of which they are a part.

CAST-IN-PLACE CONCRETE

All work to be done under this heading shall conform to the applicable provisions of Section 901 of the Standard Specifications, supplemented and amended as follows:

The concrete to be used for all cast-in-place concrete elements shall be as follows:

4000 PSI, $\frac{3}{4}$ ", 610 cement concrete shall be used for the CIP wingwall footings, CIP culvert footings CIP wingwall stems, CIP approach slabs, and CIP apron.

Included in the work are the furnishing and installing of preformed fillers, joints, joint filler material, PVC pipes for weepholes, water stops, and any other items incidental to the furnishing and placing of concrete.

STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED

All reinforcing steel shall be epoxy coated Grade 60 unless otherwise noted on the plans. All accessories to support rebar shall be epoxy coated.

All work to be done under this heading shall conform to the applicable provisions of Section 901 and M8.01.7 of the Standard Specifications.

STRUCTURAL STEEL - COATED STEEL

Work under this subheading shall include all labor and materials required to fabricate and install the galvanized steel utility supports for the gas line installed on the upstream wingwalls.

All work to be done under this heading shall conform to the applicable provisions of Section 960 of the Standard Specifications.

ITEM 995.01 (CONTINUED)

MEMBRANE WATERPROOFING

All work to be done under this heading shall conform to the applicable provisions of Section 965 of the Standard Specifications.

Membrane waterproofing shall be installed on top of the proposed concrete culvert and approach slabs, to the limits shown on the Plans. Spray applied membrane waterproofing shall be used.

METAL BRIDGE RAILING (3-RAIL), STEEL (TYPE S3-TL4)

All work to be done under this heading shall conform to the applicable provisions of Section 975 of the Standard Specifications.

PRECAST CONCRETE ELEMENTS - THREE SIDED PRECAST CONCRETE CULVERT, PRECAST CONCRETE GUARDRAIL TRANSITIONS/ENDPOSTS

CONCRETE

The concrete to be used for all precast concrete elements shall be as follows:

5000 PSI, 3/4", 685 HP cement concrete shall be used for the culvert, and guardrail transition/endposts

A. General.

The work under this heading consists of fabricating, transporting and installing the three-sided precast concrete culvert and guardrail transition endposts and includes all necessary labor, materials, and equipment to complete the work as shown on the Plans. The work shall also include the full structural design of the three-sided culvert and guardrail transition endposts. The work shall conform with the MassDOT Standard, Supplemental, and Interim Specifications and the requirements of the current AASHTO LRFD Bridge Construction Specifications, supplemented by the current relevant provisions of the latest edition of PCI MNL-116 (The Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products), except as noted herein.

QUALITY ASSURANCE

A. General.

Quality Assurance includes all the planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service. It is an all-encompassing term that includes Quality Control (performed by the Fabricator) and Acceptance (performed by the Engineer). Quality Control is the system used by the Contractor and Fabricator to monitor and assess their production processes at the plant facility and installation activities at the project site to ensure that the final product will meet the specified level of quality. Acceptance includes all factors used by the Engineer to determine the corresponding value for the product. Inspection at the plant facility is intended as a means of evaluation of compliance with contract requirements.

Contractor and Fabricator Quality Control activities and Engineer Acceptance activities shall remain independent from one another. Engineer Acceptance activities shall not replace Fabricator Quality Control activities.

B. Fabricator Quality Control.

Quality Control shall be performed by the Fabricator to ensure that the product is fabricated in conformance with the specifications herein. The Fabricator shall maintain a Quality Control system to monitor, assess, and adjust placement and fabrication processes to ensure the Precast Concrete Bridge Element(s) meet the specified level of quality, through sufficient Quality Control sampling, testing, inspection, and corrective action (where required). The Fabricator's Quality Control system shall address all key activities during the placement and fabrication and shall be performed in conformance with the Fabricator's NPCA or PCI Certification. Quality Control documentation shall meet the requirements of the *Fabricator Quality Control - Documentation* section below. Upon request, Fabricator Quality Control documentation shall be provided to the Engineer.

ITEM 995.01 (CONTINUED)

1. Plant.

Prior to the fabrication of Precast Concrete Bridge Elements, the Fabricator's precast concrete plant shall obtain the following:

- (a) Certification by the National Precast Concrete Association (NPCA) Plant Certification Program or Precast/Prestressed Concrete Institute (PCI) Plant Certification Program, for the applicable types of Precast Concrete Bridge Element(s) being fabricated
- (b) MassDOT Prequalification
- (c) MassDOT Mix Design Approval

All concrete for a given Precast Concrete Bridge Element shall be produced by a single company and plant, unless otherwise approved by the Engineer.

2. Personnel.

The Fabricator shall provide adequate training for all QC personnel in accordance with NPCA or PCI certification. There shall be sufficient personnel trained and certified to perform the tests listed under Subsection M4.02.13, Part D. At a minimum, the Fabricator's Quality Control Personnel shall maintain the following qualifications and certifications:

- (a) QC Manager with an active NETTCP Field Technician or ACI Concrete Field Testing Technician - Grade I certification or higher, and a minimum of 4 years continuous experience in the manufacture of Precast Concrete Bridge Elements for state transportation departments.
- (b) A Technician/Inspector having the Precast/Prestressed Concrete Institute (PCI) Technician/Inspector Level I or NorthEast Transportation Training and Certification Program (NETTCP) Precast Concrete Inspector, or higher.

The Contractor shall submit to the Engineer a copy of the Fabricator's Quality Control Personnel required qualifications, as specified above.

3. Laboratory.

The Fabricator shall provide a room of sufficient size to house all equipment and to adequately perform all testing. The room shall have either a separate moisture storage room or curing box for concrete cylinders, and it shall be thermostatically controlled to maintain temperatures consistent with AASHTO T 23. It shall include a desk and file cabinet for proper record keeping, and have good lighting and ventilation.

This room shall be kept for testing and quality control and not used for any other purpose. An additional desk and file cabinet shall be provided for exclusive use of the Engineer. No exception from these requirements will be allowed without the express written permission of the Engineer.

4. Testing Equipment.

At a minimum, the Fabricator's plant facility shall have the following testing equipment:

- (a) Air Content Meter Type A or B: AASHTO T 152
- (b) Air Content Meter Volumetric Method: AASHTO T 196 (Required for Lightweight Concrete)
- (c) Slump Cone: AASHTO T 119
- (d) Cylinder Molds AASHTO M 205
- (e) Concrete Testing Machine: AASHTO T 22
- (f) Screening Sieve: AASHTO T 27, AASHTO T 11
- (g) Curing Box: AASHTO T 23
- (h) Spread Test Base Plate for Self-Consolidating Concrete (SCC): ASTM C1611
- (i) All other equipment prescribed by AASHTO and ASTM standards for the tests to be performed by the Fabricator as specified

5. Inspection.

Quality Control personnel shall monitor and inspect the fabrication of each Precast Concrete Bridge Element. Quality Control personnel shall report all inspection activities on Quality Control Inspection Reports and non-conformances on Non-Conformance Reports (NCRs) throughout the entire fabrication process, as specified herein.

ITEM 995.01 (CONTINUED)

6. Temperature Monitoring.

At a minimum, the Fabricator shall monitor, record, and report the temperatures of the form, ambient temperatures surrounding the concrete, and temperatures of the concrete continuously, without interruption as specified below:

- (a) Prior to placement of concrete to verify that $T_i \geq 50^\circ\text{F}$.
- (b) Immediately after placement to verify that $T_i \geq 50^\circ\text{F}$ is maintained.
- (c) Throughout the entire duration of the curing cycle, at regular intervals not to exceed one hour until 100% Design Strength (f'_c) is attained and concrete has cooled to within 40°F of the ambient temperature surrounding the Precast Concrete Bridge Element.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest 2°F . At least two temperature sensors (thermocouples) shall be positioned to record the maximum and minimum anticipated concrete temperatures. The anticipated minimum temperature shall be measured with one or more thermocouples at a distance no greater than 2 inches from the surface of the thinnest section. The anticipated maximum temperature shall be measured with one or more thermocouples at the center of the thickest section. Proposed temperature measurement locations shall be submitted to the Engineer for approval. Temperature recording devices shall be located within the curing enclosure and calibrated as required by PCI MNL-116 Section 4.18.4. Maximum heat increase and cool down rates shall comply with PCI MNL-116, Section 4.19. The Contractor shall furnish temperature logs recorded at a minimum frequency of once per hour to the Inspector as required, with each post-pour QC inspection report.

7. Sampling and Testing.

At a minimum, the Fabricator shall perform random Quality Control sampling and testing as specified in *Table 1: Quality Control Sampling and Testing*. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during fabrication. Test Specimens shall conform to the requirements of Section M4.02.13 of the MassDOT Standard and Supplemental Specifications and AASHTO R 60, with the exception of the stripping (80% f'_c) set of cylinders. Stripping (80 % f'_c) cylinders shall be cured in the same location and environment as the Precast Bridge Elements they represent. If approved by the Engineer, compressive strength cylinder match curing equipment, that maintains the same concrete conditions that the corresponding Precast Bridge Element is exposed to, may be utilized in lieu of Stripping (80 % f'_c) field cured cylinders, with the use of thermocouples, controllers, and heaters.

Table 1: Quality Control Sampling and Testing

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size (c)	Sublot Size (d)	Frequency	Point of Sampling
Slump (in.) (a)	AASHTO T 119	Per AASHTO	≤ 8 in. or as approved by the Engineer				
Air Content (%)	AASHTO T 152	Per AASHTO	5% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°F				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	Stripping Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 80% f' c at Stripping				
		7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f' c at 28 days				
		56-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f' c at 56 days (b)				

Notes:

- (a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
- (b) 56-day Compressive Strength test specimens shall require testing only when 28-day Compressive Strength test specimens have failed to meet Design Strength (f' c).
- (c) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
- (d) Sublot shall be defined as an equal division or part of a Lot from which a sample of material is obtained in order to assess the Quality Characteristics of the Lot.

8. Certificate of Compliance.

The Fabricator shall provide a Certificate of Compliance in accordance with Standard Specifications, Division I, Section 6.01, stating that QC test cylinders have achieved the design strength, f' c. A Certificate of Compliance shall accompany each shipment and shall be presented to the Engineer or designee upon delivery to the site.

ITEM 995.01 (CONTINUED)

9. Documentation.

At a minimum, the Fabricator shall maintain a filing system for the following QC records and documentation. All QC records and documentation shall be made available to the Engineer upon the request.

- (a) Current MassDOT Approved Mix Design Sheet(s) and Approval Letter(s)
- (b) PCI or NPCA Certification
- (c) Current Qualifications and Certifications for QC Manager(s) and QC Technician(s)
- (d) Most current set of Approved Shop Drawings
- (e) Approved Placement, Finishing and Curing Plan
- (f) Approved Dunnage Plan
- (g) Fabricator Certificate of Compliance for each fabricated Precast Concrete Bridge Element
- (h) Admixture Manufacturer's Certification of Compliance for each approved Admixture
- (i) Completed QC Inspection Report for each fabricated Precast Concrete Bridge Element
- (j) Identification Number for each fabricated Precast Concrete Bridge Element
- (k) Time and date of casting of each fabricated Precast Concrete Bridge Element
- (l) Date of stripping of each fabricated Precast Concrete Bridge Element
- (m) Batch Ticket Printout reporting the quantity of concrete produced for each batch of concrete produced
- (n) Concrete temperature records for each Precast Concrete Bridge Element fabricated
- (o) QC Test Report Forms for each subplot of concrete produced
- (p) Non-Conformance Reports (NCRs)
- (q) Documentation of Repairs (if applicable)

MATERIALS

A. Materials.

Materials shall meet the following specifications (if applicable):

General	M4.00.00
Portland Cement	M4.01.0
Blended Hydraulic Cements	M4.01.1
Fly Ash	M4.01.2
Cement Concrete	M4.02.00
Cement	M4.02.01
Cement Mortar	M4.02.15
Aggregates	M4.02.02
Lightweight Aggregates	M4.02.03
Water	M4.02.04
Cement Concrete Additives	M4.02.05
Proportioning	M4.02.06
Mixing and Delivery	M4.02.10
Test Specimens	M4.02.13
Mortar for Filling Keyways	M4.04.0
Slag	AASHTO M 302
High Performance Cement Concrete	M4.06.1
Self-Consolidating Concrete (SCC)	M4.02.17
Controlled Density Fill - Non-Excavatable	M4.08.0
Reinforcing Bars	M8.01.0
Epoxy Coated Reinforcing Bars	M8.01.7
Galvanized Reinforcing Bars	M8.01.8
Welded Wire Reinforcement	M8.01.2
Mechanical Reinforcing Bar Splicer	M8.01.9
Lifting Devices	PCI MNL-116
Corrugated Metal Pipe	AASHTO M 36

1. Cement Concrete Mix Design.

The cement concrete shall be comprised of specified proportions of water and MassDOT approved aggregates, cement, supplementary cementitious materials (SCMs), and admixtures to form a homogenous composition. Cement concrete for Precast Concrete Bridge Elements shall meet the requirements of M4.06.1 High Performance Cement Concrete, with the exception that the "Total Cementitious Content" specified shall be considered the "Maximum Allowable Cementitious Content". When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

Prior to production of cement concrete, the Fabricator shall report and submit all proposed mix design formulations and its constituent materials to the Engineer for review

ITEM 995.01 (CONTINUED)

and approval. All mix design yields shall be designed for 1.0 cubic yards of concrete, with an allowable tolerance of +/- 1.0 %. All liquids incorporated into the proposed mix design(s) shall include both water and admixtures in the liquid mass calculation.

During production of cement concrete, the Fabricator shall not alter the previously approved mix design formulation or its constituent materials. Proposed alterations in source, type, batch quantity, or gradation to any of the constituent materials of the previously approved mix design formulation shall require a new Mix Design submission to the Engineer for review and approval. Fabrication shall not occur without prior mix design approval.

2. Vertical Adjustment Assembly.

Vertical Adjustment Assembly details and material requirements shall be as shown on the plans. Alternate devices may be used provided that they are adjustable and can support the anticipated loads. The design of the leveling devices, with necessary calculations, shall be submitted to the Engineer for approval.

3. Grout.

Grout used for shear keys, vertical adjustment assembly voids, and hand holes shall be in accordance with M4.04.0.

4. Reinforcement.

All reinforcing steel shall be epoxy coated Grade 60 unless otherwise noted on the plans. Mechanical reinforcing bar splicers shall be epoxy coated.

5. Threaded Inserts.

Threaded inserts are permissible to facilitate forming the keyway pours. Threaded inserts shall be hot dip galvanized or made of stainless steel. The number of threaded inserts shall be minimized, and the inserts shall not come in contact with the reinforcing steel.

6. Corrugated Metal Pipe.

Corrugated Metal Pipe to be used for forming voids as specified on the plans shall be fabricated from steel and shall have a protective metallic coating of zinc (galvanizing).

CONSTRUCTION METHODS - PLANT FABRICATION

A. Shop Drawings.

Prior to performing any work under this Section, the Contractor shall receive approval for all shop drawings for the Precast Concrete Bridge Element being worked on and any special Contract requirements, provided that a complete shop drawing package is provided. The Contractor shall not order materials or begin work before receiving approved shop drawings. The Engineer will reject Precast Concrete Bridge Elements that deviate from the approved drawings or are fabricated prior to receiving written approval of the shop drawings. The Contractor shall bear full responsibility and costs for all materials ordered or work performed prior to the approval of the shop drawings or written authorization from the Engineer.

Contractor shall submit scaled shop drawings to the Engineer for review and approval. Design calculations for the precast arch and footings shall not be included in the submittal. The Fabricator's name and address shall appear on each sheet.

Resubmittal of "Approved as Noted" shop drawings is not necessary for minor revisions, provided that the correction can be clearly understood and is unambiguous without possibility of misinterpretation. Shop drawings with questions or comments that require a response and/or additional information from the Fabricator must be resubmitted.

Detailed shop drawings shall be prepared in accordance with the relevant provisions of Subsection 5.02 and shall, at a minimum, contain the following:

- (a) Number and type and/or piece mark of the precast concrete bridge element including overall length, width and height.
- (b) Skew angle.
- (c) Location, size and geometry of all steel reinforcement, including mechanical reinforcing bar splicers to be used for connecting Precast Concrete Bridge Elements together in the field.
- (d) Location and details of all inserts, anchors, Vertical Adjustment Assemblies, and any other items required to be cast into the Precast Concrete Bridge Elements (whether detailed on the plans by the Engineer of Record or provided for the Contractor's convenience). Precast Concrete Bridge Elements shall not be fired or drilled into for attachment purposes. All hardware shall be galvanized except as noted.
- (e) Locations and details of the lifting devices, including supporting calculations, type and amount of any additional reinforcing required for lifting. The Fabricator shall design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (7th edition).
- (f) The minimum compressive strength required prior to handling the precast concrete bridge element.

The shop drawings shall not include procedures for placement, finishing, and curing of concrete. These details shall be included in the Placement, Finishing and Curing Plan that is to be submitted to the Engineer as described under *Placement, Finishing, and Curing Plan*.

B. Fabrication.

All Precast Concrete Bridge Elements shall be fabricated in accordance with the latest edition of PCI MNL-116 as modified herein.

C. Placement, Finishing and Curing Plan.

At least 30 days prior to start of fabrication, the Contractor shall submit the Fabricator's proposed Placement, Finishing and Curing Plan to the Engineer for approval. This shall be an independent submittal, separate from the fabrication shop drawings and design calculations. The Placement, Finishing and Curing Plan shall include the following:

- (a) Method of Mixing
- (b) Method of Placement
- (c) Method of Consolidation
- (d) Method of Finishing
- (e) Method of Initial Curing
- (f) Method of Intermediate Curing
- (g) Method of Final Curing
- (h) Moisture Retention Materials and Equipment (water spray equipment, saturated covers, sheet materials, liquid membrane-forming compounds, accelerated curing equipment, etc.)

ITEM 995.01 (CONTINUED)

- (i) Cylinder Curing Methods, Location, and Environmental Control (temperature, humidity, etc.)
- (j) Temperature Monitoring, Recording, and Reporting

D. Three-Sided Box Culvert and Footings

The Contractor shall submit design computations for the three-sided box culvert and footings to the Engineer for review and approval. The computations shall be prepared in accordance with the latest AASHTO LRFD Bridge Design Specifications, the 2013 MassDOT LRFD Bridge Design Manual, and the Plans using English units and HL-93 live loading. The design computations shall consider all Strength, Extreme Event and Service Limit States as are appropriate for each stage of fabrication, shipment, construction, and for the final in-service condition. Design computations and shop drawings shall be prepared and stamped by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts. The shop drawings shall be prepared and submitted in accordance with the section, Drawings, above.

The dimensions provided on the plans are shown to establish the size of the proposed opening. The width and thickness of each culvert unit may vary depending upon the manufacturer's specifications provided that the opening size is maintained. The Contractor shall be responsible for modifying the dimensions of the elements to compensate for elastic shortening, shrinkage, grade corrections, and other phenomena that make in-process fabricating dimensions different from those shown on the drawings. Approval of the shop drawings shall not relieve the Contractor from responsibility for the correctness of the dimensions shown.

1. Joints.

The precast reinforced concrete three-sided box culvert shall be produced with grout-filled keyways per the details on the plans, the manufacturer's recommendations, and as approved by the Engineer. The ends shall be manufactured such that when the sections are laid together they will make a continuous line of frames with a smooth interior surface free of appreciable irregularities, and in compliance with the permissible variations.

2. Marking.

The following information shall be clearly marked on the interior of each frame by indentation, waterproof paint, or other approved means:

- (a) Frame span and rise
- (b) Date of manufacture and lot number
- (c) Name and trademark of the manufacturer

E. Reinforcement.

The reinforcing bars shall be installed in accordance with Section 901.62 of the Supplemental Specifications, including tolerances for cover and horizontal spacing of bars. Components of mechanical reinforcing bar splicers shall be set with the tolerances shown on the plans. The reinforcing bars and mechanical reinforcing bar splicers shall be assembled into a rigid cage that will maintain its shape in the form and which will not allow individual reinforcing bars to move during the placement of concrete. This cage shall be secured in the form so that the clearances to all faces of the concrete, as shown on the plans, shall be maintained.

Where reinforcing bars are to protrude from one Precast Concrete Bridge Element in order to mate with reinforcing bar splicers in a second precast concrete element, the fabricator shall set the reinforcing bars and the reinforcing bar splicers with a template in order to ensure proper fit up within the tolerances specified on the plans.

F. Tolerances.

Fabrication shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement shall be in accordance with 901.62. In the absence of specifications on the plans, tolerances shall comply with the latest version of the PCI MNL 135, Precast Tolerance Manual.

G. Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the Precast Concrete Bridge Elements within specified tolerances to the shapes, lines and dimensions shown on the approved fabrication drawings. Forms shall be constructed from flat, smooth, non-absorbent material and shall be sufficiently tight to prevent the leakage of the plastic concrete. When wood forms are used, all faces in contact with the concrete shall be laminated or coated with a non-absorbent material. All worn or

ITEM 995.01 (CONTINUED)

damaged forms, which cause irregularities on the concrete surface or damage to the concrete during form removal, shall be repaired or replaced before being reused. Any defects or damage of more than "Category 2, Minor Defects" made to the concrete, due to form work, stripping or handling, shall be subject to repair or rejection, as defined in the *Repairs and Replacement* section. If threaded inserts are cast into the elements for support of formwork, the inserts shall be recessed a minimum of 1 inch and shall be plugged after use with a grout of the same color as that of the precast cement concrete.

H. Mixing of Concrete.

The concrete shall be proportioned and mixed in conformance with the Fabricator's approved mix design and M4.02.10 Mixing and Delivery Fabrication shall not occur without prior mix design approval. The Fabricator shall provide copies of batch tickets to the Engineer.

I. Placement of Concrete.

Prior to the placement of concrete, the temperature of the forms shall be greater than or equal to 50°F. Quality Control inspection shall be performed by the Fabricator as specified in the *Fabricator Quality Control* section. The Fabricator shall verify all materials and equipment required for protecting and curing the concrete are readily available and meet the requirements of the *Final Curing Methods* section below. All items encased in the concrete shall be accurately placed in the position shown on the Plans and firmly held during the placing and setting of the concrete. Clearance from the forms shall be maintained by supports, spacers, or hangers and shall be of approved shape and dimension.

During placement, the concrete shall maintain a concrete temperature range between 50°F and 90°F. The Fabricator shall minimize the time to concrete placement (measured from start of mixing to completion of placement). In no event shall time to placement exceed 90 minutes. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during the placement of the concrete as specified in the *Fabricator Quality Control* section above. Delays or shutdowns of over 30 minutes shall not be allowed during the continuous filling of individual forms.

J. Consolidation of Concrete.

Suitable means shall be used for placing concrete to prevent segregation or displacement of reinforcing steel or forms. The concrete shall be thoroughly consolidated by external or internal vibrators or a combination of both. Vibrators shall not be used to move concrete within the forms. Vibrators shall be used as specified in 901.63C and as directed by the Engineer. Concrete shall be placed and consolidated in a way that minimizes the presence of surface voids or bug holes on the formed surfaces. When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

K. Finishing of Concrete.

The finish of the Precast Concrete Bridge Elements shall be as indicated on the plans. Where Precast Concrete Bridge Elements have keyways for grout or closure pours, the surfaces of these shear keys shall be abrasive blasted prior to shipment. The Fabricator may utilize a surface retarder with water blast, sandblast, or a combination of both to achieve the desired keyway finish. At a minimum, the profile of the keyway surfaces shall be similar to that of 60 grit sand paper. The exposed reinforcing steel in the precast slab shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer.

The Fabricator shall permanently mark each precast concrete bridge element with its type and/or piece mark, date of casting, and supplier identification either by stamp markings in fresh concrete, waterproof paint, or other approved means on a surface that will not be exposed after assembly.

L. Exposed Surfaces of Precast Concrete Bridge Elements.

As soon as conditions permit, before the concrete has fully hardened, all dirt, laitance, and loose aggregate shall be removed from the exposed concrete surfaces. Contractor shall not allow foot traffic on the uncured concrete until it has reached sufficient strength to prevent damage.

ITEM 995.01 (CONTINUED)

M. Exposed Surfaces of Closure Pour Shear Keys.

The closure pour shear key cast in the sides of the beam flanges shall have an exposed aggregate finish. The closure pour reinforcing steel and its coating shall not be damaged by the process for creating the exposed aggregate surface. Fabricator may utilize a surface retarder with water blast, abrasive blast, or a combination of both to achieve the desired shear key finish. The abrasive blast shall use oil free compressed air. The profile of the shear key surfaces shall be similar to that of 60 grit sand paper.

N. Initial Curing Methods.

After the placement of concrete and prior to concrete finishing, the Fabricator shall initiate initial curing methods when the concrete surface begins to dry, to reduce moisture loss from the surface. Application of one or more of the following initial curing methods shall occur immediately after the bleed water sheen has disappeared.

1. Fogging.

Fogging nozzles shall atomize water into a fog-like mist. The fog spray shall be directed and remain visibly suspended above the concrete surface, to increase the humidity of the air and reduce the rate of evaporation. Water from fogging shall not be worked into the surface during finishing operations and shall be removed or allowed to evaporate prior to finishing.

2. Liquid-applied Evaporation Reducers

Evaporation reducers shall be sprayed onto the freshly placed concrete surface to produce an effective monomolecular film that reduces the risk of plastic-shrinkage cracking and rate of evaporation of the bleed water from the concrete surface. Evaporation reducers shall be applied in accordance with manufacturer's recommendations.

O. Intermediate Curing Methods.

The Fabricator shall initiate intermediate curing methods if concrete finishing has taken place prior to the concrete reaching final set. The freshly finished concrete surface shall be protected from moisture loss, by the continuation of initial curing methods (fogging and evaporation reducers) until final curing methods are applied or by the use of liquid membrane-forming curing compounds (see *Liquid Membrane-Forming Compounds for Curing* section).

P. Final Curing Methods.

The Fabricator shall initiate and apply final curing methods to the concrete immediately after the following conditions are met:

- (a) Completion of concrete finishing
- (b) Final set of concrete
- (c) Concrete has hardened sufficiently enough to prevent surface damage

During fabrication of Precast Concrete Bridge Elements, the Fabricator shall maintain the required concrete temperature ranges throughout the entire duration of the final curing method cycle as specified herein. Controlled and gradual termination of the final curing method shall occur after all specified conditions are met. The concrete temperature shall be reduced at a rate not to exceed 36°F per hour until the concrete temperature is within 20°F of the ambient temperature outside of the final curing method enclosure. The Fabricator shall maintain a minimum concrete temperature of 40°F until 100% f'c is attained (see *Handling and Storage* section below).

1. Water Spray Curing.

All exposed concrete surfaces shall remain moist with a continuous fine spray of water throughout the entire duration of the final curing method cycle (see *Table 4: Final Curing Method Cycle for Water Spray*).

Table 4: Final Curing Method Cycle for Water Spray

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Five (5) days	≥ 80% f'c

2. Saturated Covers for Curing.

All exposed concrete surfaces shall remain moist with a continuous application of

ITEM 995.01 (CONTINUED)

saturated covers throughout the entire duration of the final curing method cycle (see *Table 5: Final Curing Method Cycle for Saturated Covers*). Saturated covers shall be allowed to dry thoroughly before removal to provide uniform, slow drying of the concrete surface.

Table 5: Final Curing Method Cycle for Saturated Covers

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Three (3) days	≥ 80% f'c

Saturated covers, such as burlap, cotton mats, and other coverings of absorbent materials shall meet the requirements of AASHTO M 182, Class 3. Saturated covers shall be in good condition, free from holes, tears, or other defects that would render it unsuitable for curing concrete. Saturated covers shall be dried to prevent mildew when storing. Prior to application, saturated covers shall be thoroughly rinsed in water and free of harmful substances that are deleterious or cause discoloration to the concrete. Saturated covers shall have sufficient thickness and proper positioning onto the concrete surface to maximize moisture retention.

Saturated covers shall contain a sufficient amount of moisture to prevent moisture loss from the surface of the concrete. Saturated covers shall be kept continuously moist so that a film of water remains on the concrete surface throughout the entire duration of the final curing method cycle. The Fabricator shall not permit the saturated covers to dry and absorb water from the concrete. Use of polyethylene film (see *Polyethylene Film* section) may be applied over the saturated cover to potentially decrease the need for continuous watering.

3. Sheet Materials for Curing.

All exposed concrete surfaces shall remain moist with a continuous application of curing sheet materials throughout the entire duration of the final curing method cycle (see *Table 6: Final Curing Method Cycle for Curing Sheet Materials*).

Table 6: Final Curing Method Cycle for Sheet Materials

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Three (3) days	≥ 80% f'c

Sheet Materials used for curing, such as polyethylene film, white burlap-polyethylene sheeting, and reinforced paper shall meet the requirements of ASTM C171 and the specifications herein. Sheet materials shall inhibit moisture loss and reduce temperature rise in concrete exposed to radiation from the sun during the final curing method cycle. Adjoining covers shall overlap not less than 12 inches. All edges of the covers shall be secured to maintain a moist environment.

(a) Polyethylene Film.

Polyethylene film shall meet the requirements of ASTM C171, consist of a single sheet manufactured from polyethylene resins, be free of visible defects, and have a uniform appearance. Careful considerations shall be taken by the Fabricator to prevent the film from tearing during storage and application, so as to not disrupt the continuity of the film (polyethylene film reinforced with glass or other fibers is more durable and less likely to be torn). The Fabricator shall monitor the application of the film to prevent uneven spots from appearing (mottling) on the concrete surface, due to variations in temperature, moisture content, or both. The Fabricator shall prevent mottling from occurring on the concrete surface by applying additional water under the film or applying a combination of polyethylene film bonded to absorbent fabric to the concrete surface to retain and evenly distribute the moisture.

Immediately following final finishing, polyethylene film shall be placed over the surface of the fresh concrete surface, so as to not damage the surface of the concrete and shall be placed and weighted so that it remains in contact with the concrete throughout the entire duration of the final curing method cycle. The film shall extend beyond the edges of the concrete surface. The film shall be placed flat on the concrete surface, avoiding wrinkles, to minimize mottling. Edges of adjacent polyethylene film shall overlap a minimum of 6 inches and be tightly sealed with the use of sand, wood planks, pressure-sensitive tape, mastic, or glue to maintain close contact with the concrete surface, retain moisture, and prevent the formation of air pockets throughout the entire duration of the final curing method cycle.

ITEM 995.01 (CONTINUED)

(b) White Burlap-Polyethylene Sheeting

White burlap-polyethylene sheeting shall meet the requirements of ASTM C171, be securely bonded to the burlap so to avoid separation of the materials during handling and curing of the concrete, and be applied in the same manner as the polyethylene film.

(c) Reinforced Impervious Paper.

Reinforced impervious paper shall meet the requirements of ASTM C171, consist of two sheets of kraft paper cemented together with a bituminous adhesive and reinforced with embedded cords or strands of fiber running in both directions, and be white in color. Reinforced impervious paper shall be treated to prevent tearing when wetted and dried.

Reinforced impervious paper can be reused so long as it is effective in retaining moisture on the concrete surface. The Fabricator shall visually inspect the reinforced impervious paper for all holes, tears, and pin holes from deterioration of the paper through repeated use by holding the paper up to the light. The paper shall be discarded and prohibited from use when the moisture is no longer retained.

After the concrete has hardened sufficiently to prevent surface damage, the concrete surface shall be thoroughly wetted prior to the application of the reinforced impervious paper, and be applied in the same manner as the polyethylene film.

4. Liquid Membrane-Forming Compounds for Curing.

All exposed concrete surfaces shall remain moist with a continuous application of liquid membrane-forming compounds throughout the entire duration of the final curing method cycle (see *Table 7: Final Curing Method Cycle for Liquid Membrane-Forming Compounds*).

Table 7: Final Curing Method Cycle for Liquid Membrane-Forming Compounds

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Seven (7) days	≥ 80% f'c

Liquid membrane-forming compounds shall meet the requirements of ASTM C 1315, Type I, Class A and shall exhibit specific properties, such as alkali resistance, acid resistance, adhesion-promoting quality, and resistance to degradation by ultraviolet light, in addition to moisture-retention capabilities. Liquid membrane-forming compounds shall consist of waxes, resins, chlorinated rubber, or other materials to reduce evaporation of moisture from concrete. Liquid membrane-forming compounds shall be applied in accordance with the manufacturer's recommendations.

Liquid membrane-forming compounds shall be applied immediately after the disappearance of the surface water sheen following final finishing. All exposed surfaces shall be wetted immediately after form removal and kept moist to prevent absorption of the compound, allowing the curing membrane to remain on the concrete surface for proper membrane moisture retention. The concrete shall reach a uniformly damp appearance with no free water on the surface prior to the application of the compound.

If patching or finishing repairs are to be performed prior to the application of the compound, the Precast Concrete Bridge Element shall be covered temporarily with saturated covers until the repairs are completed and the compound is applied. Only areas being repaired shall be uncovered during this period. While the saturated covers are removed to facilitate the patching process, the work shall continue uninterrupted. If for any reason the work is interrupted, saturated covers shall be placed onto the uncovered concrete surface, until the work continues and is completed, at which time the curing compound shall be applied to the repaired area.

Careful considerations shall be made by the Fabricator to determine if the evaporation rate is exceeding the rate of bleeding, thus causing the surface to appear dry even though bleeding is still occurring. Under such conditions, the application of liquid membrane-forming compounds to the concrete surface shall be delayed, in order to prevent bleed water from being sealed below the concrete surface and avert map cracking of the membrane films, reduction in moisture-retention capability, and reapplication of the compound. To diagnose and prevent this condition, the Fabricator shall place a transparent plastic sheet over a test area of the uncured and unfinished concrete surface and shall determine if any bleed water accumulates under the plastic.

The compound shall be applied in two applications at right angles to each other to ensure uniform and more complete coverage. On very deeply textured surfaces, the surface area to be treated shall be at least twice the surface area of a troweled or floated surface. In such cases, two separate applications may be needed, each at 200 ft²/gal., with the first being allowed to become tacky before the second is applied.

ITEM 995.01 (CONTINUED)

The curing compound shall be applied by power sprayer, using appropriate wands and nozzles with pressures between 25 and 100 psi. For very small areas such as repairs, the compound shall be applied with a wide, soft-bristled brush or paint roller. The compound shall be stirred or agitated before use and applied uniformly in accordance with the manufacturer's recommended rate. The Fabricator shall verify the application rates are in accordance with the manufacturer's recommended rate.

When the concrete surface is to receive paint, finishes, or toppings that require positive bond to the concrete, it is critical that the curing procedures and subsequent coatings, finishes, or toppings be compatible to achieve the necessary bond

After the termination of the final curing method cycle has occurred, liquid membrane-forming compounds shall be removed by blast-cleaning from any concrete surface that is to receive paint, finishes, plastic concrete from secondary pour, grout, or any other toppings that require bonding to the concrete surface. These surfaces shall be further blast-cleaned to remove the cement matrix down to exposed aggregate to ensure proper bonding to the material. The method used to remove the curing compound shall not damage the reinforcement and coating. Compounds are prohibited on any concrete surface that will have a penetrating or coating type treatment such as a sealer, stain, or waterproofing membrane applied to it.

5. Accelerated Curing.

Accelerated curing shall use live steam or radiant heat with moisture in accordance with PCI MNL-116 as modified herein. The concrete temperature shall meet the maximum heat increase and cool down rates as specified herein. Concrete temperature monitoring shall meet the requirements of the *Temperature Monitoring* section. Excessive and fluctuating rates of heating and cooling shall be prohibited. The concrete temperature shall not exceed 158°F at any time. The Fabricator shall meet the following accelerated curing sequencing and requirements.

(a) Initial Delay Period.

The initial delay period shall be defined as the duration immediately following the placement of the concrete and the attainment of initial set of the concrete. The Fabricator shall determine the time of initial set in accordance with AASHTO T 197 specifications. Throughout the entire duration of the preset period, initial curing shall be implemented. The temperature increase period (see *Temperature Increase Period* section) shall not occur until initial set of the concrete is attained. During the initial delay period, the concrete temperature shall meet the following requirements:

- i. Concrete temperature rate of increase shall not exceed 10°F per hour.
- ii. Total concrete temperature increase shall not exceed 40°F higher than the placement concrete temperature or 100°F, whichever is less

(b) Temperature Increase Period.

The temperature increase period shall be defined as the duration immediately following the completion of the initial delay period (after initial set) and immediately prior to the start of the constant maximum temperature period. Application of steam to the enclosure shall not occur until the initial delay period is complete. After the initial delay period is complete, all exposed concrete surfaces shall be cured in a moist environment where the concrete temperature increases at a rate not to exceed 36°F per hour.

(c) Constant Maximum Temperature Period.

The constant maximum temperature period shall be defined as the duration immediately following the completion of the temperature increase period and immediately prior to the start of the temperature decrease period. After the temperature increase period is complete, all exposed concrete surfaces shall be cured in a moist environment at a controlled and constant elevated temperature throughout the entire duration of the constant maximum temperature period. Termination of the constant maximum temperature period and the start of the termination decrease period shall occur after all specified conditions are met (see *Table 8: Constant Maximum Temperature Period*).

Table 8: Constant Maximum Temperature Period

Sustained Concrete Temperature	Constant Maximum Temperature Period	Compressive Strength
120°F ≤ °F ≤ 158°F	6 hrs ≤ Time ≤ 48 hrs	≥ 80% f'c

ITEM 995.01 (CONTINUED)

(d) Temperature Decrease Period.

After the constant maximum temperature period is complete, the concrete temperature shall be cured in a moist environment at a controlled and reduced rate not to exceed 36°F per hour until the concrete temperature is within 20°F of the ambient temperature outside of the curing enclosure.

Q. Stripping.

The Fabricator shall not strip forms or handle the Precast Concrete Bridge Element until Quality Control compressive strength cylinders attain a minimum compressive strength of 80% Design Strength (f'_c) or the value indicated on the approved drawings has been achieved. After removal from the form, all exposed concrete surfaces shall continue to be cured in conformance with the *Final Curing Methods* sections until completion.

R. Handling and Storage of Precast Concrete Bridge Elements.

Precast Concrete Bridge Elements may be exposed to temperatures below freezing (32°F) when the chosen curing cycle has been completed, provided that the following conditions are met:

- (a) Precast Concrete Bridge Elements are protected from precipitation with polyethylene curing covers until 100% f'_c is attained
- (b) Precast Concrete Bridge Elements maintain a minimum concrete temperature of 40°F until 100% f'_c is attained

Precast Concrete Bridge Elements damaged during handling and storage will be repaired or replaced at the Engineer's direction at no cost to the Town. Precast Concrete Bridge Elements shall be lifted at the designated points by approved lifting devices embedded in the concrete and in accordance with proper lifting and handling procedures. Storage areas shall be smooth and well compacted to prevent damage due to differential settlement. Precast Concrete Bridge Elements shall be supported on the ground by means of continuous blocking, in accordance with the approved dunnage plan.

Precast Concrete Bridge Elements shall be loaded on a trailer with blocking as described above, in accordance with the approved dunnage plan. Shock-absorbing cushioning material shall be used at all bearing points during transportation of the Precast Concrete Bridge Elements. Blocking shall be provided at all locations of tie-down straps. Precast Concrete Bridge Elements stored prior to shipment shall be inspected by the Contractor prior to being delivered to the site to identify damage that would be cause for repair or rejection.

S. Repairs and Replacement.

In the event defects are identified, they shall be classified in the following categories and a non-conformance report (NCR) shall be filed if required. The NCR shall be submitted to the Engineer for review. Defects in all categories shall be documented by plant Quality Control personnel and made available to the Engineer upon request. Any required repairs shall utilize materials listed on the MassDOT QCML.

Where noted, defects shall be repaired according to the PCI Northeast Region Guidelines for Resolution of Non-Conformances in Precast Concrete Bridge Elements, Report Number PCINE-18-RNPCBE. Please note that reference to PCINE-18-RNPCBE is made for repair details only. In the case of conflicts with this Special Provision, this Special Provision shall govern.

1. Category 1, Surface Defects.

Category 1 defects do not need to be repaired, and an NCR does not need to be filed. Surface defects are defined as the following:

- (a) Surface voids or bug holes that are less than 5/8-inch in diameter and less than ¼-inch deep, except when classified as Category 4
- (b) Cracks less than or equal to 0.006 inches wide
- (c) Cracks less than or equal to 0.125 inches wide on surfaces that will receive a field-cast concrete overlay

2. Category 2, Minor Defects.

Category 2 defects shall be repaired, but an NCR does not need to be filed. Minor defects are defined as the following:

- (a) Spalls, honeycombing, surface voids that are less than 2 inches deep and have no dimension greater than 12 inches
- (b) Cracks less than or equal to 0.016 inches that will not receive a concrete overlay

ITEM 995.01 (CONTINUED)

(c) Broken or spalled corners that will be covered by field-cast concrete

Minor defects shall be repaired according to PCINE-18-RNPCBE. Cracks shall be sealed according to the PCI Repair Procedure #14 in PCINE-18-RNPCBE.

3. Category 3, Major Defects.

For Category 3 defects, the Fabricator shall prepare an NCR that documents the defect and describes the proposed repair procedure. The NCR shall be submitted to the Engineer for approval prior to performing the repair. Major defects are defined as the following:

- (a) Spalls, honeycombing and surface voids that are deeper than 2 inches or have any dimension greater than 12 inches, when measured along a straight line
- (b) Concentrated area of defects consisting of four or more Category 2 Defects within a 4-square foot area.
- (c) Exposed reinforcing steel
- (d) Cracks greater than 0.016 inches and less than or equal to 0.060 inches in width that will not receive a concrete overlay
- (e) Bearing area spalls with dimensions not exceeding 3 inches
- (f) Cracks, spalls and honeycombing that will be encased in cast in place concrete need not be repaired, but the limits and location of the defects shall be documented with an NCR

Upon approval, defects and cracks shall be repaired according to PCINE-18-RNPCBE and this specification. All repairs shall be completed at the expense of the Contractor.

4. Category 4, Rejectable Defects.

Rejectable defects as determined by the Engineer may be cause for rejection. Fabricator may submit an NCR with a proposed repair procedure, requesting approval. Some rejectable defects are defined as the following:

- (a) Surface defects on more than 5% of the surface area which will be exposed to view after installation
- (b) Minor defects that in total make up more than 5% of the surface area of the unit
- (c) Cracks greater than 0.060 inches in width except as noted in Category 1
- (d) Elements fabricated outside of the specified tolerances
- (e) MassDOT compressive strength testing that does not meet the specified Design Strength, f'_c

T. Shipping.

Prior to shipment, the Fabricator shall perform the following actions and provide the required documentation to the Engineer:

- (a) Precast Concrete Bridge Elements shall remain at the Fabricator's plant for a minimum of 7 days after cast date.
- (b) QC Inspection Reports shall be signed by the Quality Control Manager and provided to the Engineer.
- (c) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Bridge Element's representative Sublot shall be generated by the Fabricator and provided to the Engineer.
- (d) Certificate of Compliance shall be generated by the Fabricator as described under the Fabricator Quality Control section and provided to the Engineer.
- (e) All Engineer approved Corrective Actions submitted on the Non-Conformance Reports (NCR), shall be verified to have been completed by the Engineer and Quality Control Manager.
- (f) All NCRs shall be signed off by the Quality Control Manager and the Engineer

U. Delivery.

Upon Delivery, the following documentation shall be provided to the Resident Engineer or designee:

- (a) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Bridge Element's representative subplot.
- (b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
- (c) QC Inspection Reports signed by the Quality Control Manager.

The Contractor shall inspect Precast Concrete Bridge Elements upon receipt at the site. Precast Concrete Bridge Elements damaged during delivery shall be repaired or

ITEM 995.01 (CONTINUED)

replaced at the Engineer's direction at no additional cost.

CONSTRUCTION METHODS - FIELD CONSTRUCTION

A. General.

All of the Contractor's field personnel involved in the erection and assembly of the Precast Concrete Bridge Elements shall have knowledge of and follow the approved Erection Procedure. Prior to installation, the following documentation shall be reviewed and confirmed by the Engineer or designee:

- (a) QC Compressive Strength Test Report Forms attaining Design Strength, $f'c$ for the Precast Concrete Bridge Element's representative subplot.
- (b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
- (c) QC Inspection Reports signed by the Quality Control Manager.

Field construction staff shall verify that the Engineer has accepted all Precast Concrete Bridge Elements prior to installation.

B. Erection Procedure

Prior to the erection, the Contractor shall submit an Erection Procedure for approval by the Engineer. This submittal shall include computations and drawings for the transport, hoisting, erection and handling of the Precast Concrete Bridge Elements. The Erection Procedure shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts with working knowledge of the Contractor's equipment, approved shop drawings, and materials to build the bridge. The Erection Procedure shall, at a minimum, include the following:

1. Erection Procedure

The Erection Procedure shall be prepared to conform to the requirements of 960.61, Erection and the applicable sections in Chapter 8 of the PCI Design Handbook (seventh edition) for handling, erection, and bracing requirements. At a minimum, the Erection Procedure shall provide:

- (a) Minimum concrete compressive strength for handling the Precast Concrete Bridge Elements.
- (b) Concrete stresses during handling, transport, and erection.
- (c) Crane capacities, pick radii, sling geometry, and lifting hardware.
- (d) Verification that the equipment can handle all pick loads and weights with the required factor of safety.
- (e) Evaluation of construction sequence and evaluation of any geometric conflicts in the lifting of the Precast Concrete Bridge Elements and setting them as shown on the plans.
- (f) Design of crane supports including verification of subgrade for support.
- (g) Location and design of all temporary bracing that will be required during erection.

Non-shrink grout and concrete materials, approved by the Engineer, shall be placed as shown on the plans. Fill joints, keyways, and voids, in strict accordance with the specifications and manufacturer's recommendations and instructions.

For footings once these Precast Concrete Bridge Elements have been set to the correct horizontal and vertical alignment, the void between them and the supporting soil shall be filled with Controlled Density Fill - Non-Excavatable to the limits as shown on the plans. Add additional grout ports in the footings to facilitate the bedding process if required.

Joints shall be filled flush to the top with non-shrink grout, and any vertical misalignment between adjacent elements shall be feathered out on a slope of 1 to 12.

Curing of grout or concrete shall be performed in strict accordance with the specifications and manufacturer's recommendations. Filling shall not be completed in cold weather when either the ambient temperature or the precast member's temperature is below the manufacturer's recommendation. No localized heating of either the precast members or of the air surrounding the element will be permitted in an attempt to reach application temperatures.

If the joints or voids are not filled within five days after the Precast Bridge Elements are erected, the Contractor shall cover and protect the openings from weather and debris until they are filled.

ITEM 995.01 (CONTINUED)

C. Survey and Layout.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. The Engineer reserves the right to perform additional independent survey. If discrepancies are found, the Contractor may be required to verify previous survey data.

D. Preparation of Closure Pour Keyways.

Immediately prior to erecting the Precast Concrete Bridge Elements, the closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the precast concrete shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer. The surfaces of the shear keys shall be wetted so that the surfaces shall have a Saturated Surface Dry (SSD) condition for at least 24 hours prior to the placement of the closure pour concrete.

E. Erection.

The elements shall be placed in the sequence and according to the methods outlined in the Erection Procedure. As the erection proceeds, the Contractor shall constantly monitor the assembly to ensure that the precast concrete bridge element is within proper horizontal and vertical location and tolerances prior to releasing it from the crane and setting the next unit. The Contractor may use shims to maintain proper setting tolerances.

The concrete elements shall be lifted only by the lifting devices, and the utmost care shall be taken to prevent distortion of the elements during handling, transportation or storage.

Suitable spreaders shall be used during lifting so that only a vertical pull will be made on the lifting device. A non-vertical lifting force may be permitted if prior written approval is given by the Engineer. This approval will be contingent on the Contractor demonstrating by calculations, prepared by a Professional Engineer registered in Massachusetts, that the elements will not be damaged by the non-vertical lifting force and by documentation that the capacity of the lifting devices is adequate for the non-vertical lifting force.

Precast components shall be pre-bed with non-shrink grout thicker than shim stacks prior to placing other precast elements on top of them.

After all Precast Concrete Bridge Elements have been placed, the actual overall dimensions of the structure both horizontal and vertical, as laid out shall not deviate from the nominal dimensions shown on the plans beyond a tolerance of +0 inches and -1 inches. Once the layout of Precast Concrete Bridge Elements has been accepted by the Engineer, the Contractor shall cut all lifting devices off below the surfaces of the elements.

F. Box Culverts, Three-Sided Frames and Arches.

Backfilling operations shall not begin until the following checks have been made:

- (a) The frame to footing key joints are grouted as shown on the plans;
- (b) The joints between exterior frame bridge elements and wingwall stems are complete as shown on the plans;
- (c) All joint seals are properly placed.

Backfill shall be paid for under separate items. The backfilling procedures shall be in accordance with Sections 120, 150, and 170 of the Standard Specifications and Supplemental Specifications modified as follows:

- (a) Fill shall be placed and compacted in layers not exceeding one foot in depth;
- (b) Dumping of fill shall not be allowed any nearer to the structure than 3.25 feet from a vertical plane extending from the back of the footing;
- (c) Backfill shall be placed as symmetrically as possible around the structure with differential depths of backfill on each side of the structure not exceeding 1.5 feet with respect to each other;
- (d) Compaction shall be achieved using hand compaction equipment for all fill within one foot of the structure;
- (e) The bare structure shall not be crossed by any equipment heavier than that specified by the frame manufacturer. All damage resulting from equipment damage shall be rectified to the satisfaction of the Engineer at no cost to the Town;

ITEM 995.01 (CONTINUED)

- (f) Construction equipment will not be permitted atop an uncompleted structure;
- (g) Construction equipment whose weight exceeds the design capacity shall not be permitted atop the completed structure under any circumstances;
- (h) The use of vibratory rollers for compaction purposes will not be permitted.

A representative of the manufacturer shall be on site at the commencement of the installation, at no cost to the Town, to assist the Contractor. The representative shall offer advisory assistance only and shall not supplant the Contractor's representative, or the Engineer.

G. Filling of Blockouts for Lifting Devices and Threaded inserts.

If the blockouts in the Precast Concrete Bridge Elements where the lifting devices were located will be exposed and visible after assembly is complete, the Contractor shall fill these blockouts with Cement Mortar (M4.02.15) or grout.

SCHEDULE OF BASIS FOR PARTIAL PAYMENT

At the time of bid, the Contractor shall submit on his/her proposal form a schedule of unit prices for the major component Sub-Items that make up Item 995.01 as well as his/her total bridge structure Lump Sum cost. The bridge structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Contractor for the individual bridge components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 995.01 and no further compensation will be allowed.

The schedule on the proposal form applies only to Bridge Structure. Payment for similar materials and construction at locations other than at this bridge structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

GENERAL

The Contractor shall furnish police services required to direct traffic on existing roadways where traffic is maintained. The Contractor shall provide such police officers as may be deemed necessary by either the Engineer or the Town of Norwood for the direction and control of all traffic traveling within the project area. The police officers shall be obtained from the Norwood Police Department as applicable. The police officers shall be paid by the Contractor at the prevailing rate of wages established by the Town of Norwood. The Town of Norwood shall reimburse the Contractor for police services. The Contractor shall only pay the Detail rate. The surcharge rate shall not be reimbursed.

The services of uniformed police officers for the maintenance of traffic shall be used if required by Norwood Police Department (PD). The Contractor shall be responsible to contact the police department to arrange for a police detail at least 24 hours before the detail is needed. The Contractor shall be responsible to check and sign all police detail slips on a daily basis as they occur, noting the name of the officer, the municipal PD, the date and time the officer arrived and ended provision of the traffic detail. The actual payment to the PD will be made directly by the Contractor who will be reimbursed by the Town of Norwood by including proof of payment to the PD attached to the submitted pay request.

To cancel a scheduled Police Detail, the Contractor shall notify the PD a minimum of two hours prior to when the detail was to begin. The Contractor should note the name of the person at the PD who was contacted, along with the date and time of the cancellation. Failure to give at least a two-hour prior notice to the PD to cancel a scheduled police detail will result in the Contractor paying the four hour minimum uniformed officer(s) charge at the contracted police wage rate, with no compensation from the Town of Norwood.

Nothing contained herein shall be construed as relieving the Contractor of any of his/her responsibilities for protection of persons and property under the terms of the Contract.

ALLOWANCE OF POLICE SERVICES

An allowance of \$10,000 for Bridge No. N-25-034 (96H) for the furnishing of police services has been included in all bids. This allowance is determined by multiplying the number of hours estimated as necessary by the prevailing hourly rate of wages established for such services. The Contractor shall submit certified copies of itemized bills of services rendered for review and approval by the Engineer. Item 999.1 shall be measured for payment by the actual police details paid for directly by the Contractor submitted as part of pay requests, including proof of payment attached and reimbursed by the Town of Norwood at the actual cost of the police details. The allowance will be adjusted to the actual amount paid for authorized and approved police services as stipulated and shall include other payments due to any legal requirements of the State and Federal governments.

SECTION E - PRICING & CONTRACT PAGES

- 1 QUANTITIES: The quantities used herein are approximate only and are solely for the purpose of facilitating the comparison of bid. The Contractor's compensation shall be computed upon the work actually performed, measured by the unit of measurement specified, whether greater or less than the quantities shown in the Bid Summary Sheets, and that the unit prices set against the several work items cover all incidental services required of the Contractor under the Contract.

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
100.59*	1	AT ELECTRICAL WORK - LIGHT POLE SERVICE _____ PER LUMP SUM				
120.1	40	AT UNCLASSIFIED EXCAVATION _____ PER CUBIC YARD				
140.	725	AT BRIDGE EXCAVATION _____ PER CUBIC YARD				
148.	145	AT DREDGING AND DISPOSING OF MATERIAL _____ PER CUBIC YARD				
148.01*	30	AT DREDGING AND STOCKPILING OF STREAMBED MATERIAL _____ PER CUBIC YARD				
151.	550	AT GRAVEL BORROW _____ PER CUBIC YARD				
151.2	125	AT GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES _____ PER CUBIC YARD				
156.1	5	AT CRUSHED STONE FOR BRIDGE FOUNDATIONS _____ PER TON				
402.	25	AT DENSE GRADED CRUSHED STONE FOR SUB-BASE _____ PER CUBIC YARD				
415.3	70	AT PAVEMENT MICRO MILLING _____ PER SQUARE YARD				
450.23	25	AT SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) _____ PER TON				
450.31	15	AT SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) _____ PER TON				
450.32	35	AT SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) _____ PER TON				

CARRIED FORWARD _____

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
450.60	5	AT SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B - 9.5) _____ PER TON				
450.70	5	AT SUPERPAVE BRIDGE PROTECTIVE COURSE - 9.5 (SPC-B - 9.5) _____ PER TON				
482.3	150	AT SAWCUTTING ASPHALT PAVEMENT _____ PER FOOT				
504.	40	AT GRANITE CURB TYPE VA4 - STRAIGHT _____ PER FOOT				
580.	85	AT CURB REMOVED AND RESET _____ PER FOOT				
620.12	13	AT GUARDRAIL, TL-2 (SINGLE FACED) _____ PER FOOT				
627.1	1	AT TRAILING ANCHORAGE _____ PER EACH				
627.82	1	AT GUARDRAIL TANGENT END TREATMENT, TL-2 _____ PER EACH				
628.24	2	AT TRANSITION TO BRIDGE RAIL _____ PER EACH				
697.2*	65	AT FLOATING SILT FENCE _____ PER FOOT				
698.1*	150	AT GEOTEXTILE FABRIC FOR STABILIZATION _____ PER SQUARE YARD				
702.	5	AT HOT MIX ASPHALT SIDEWALK OR DRIVEWAY _____ PER TON				
734.*	1	AT SIGN REMOVED AND RESET _____ PER EACH				

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
748.	1	AT MOBILIZATION PER LUMP SUM				
751.	15	AT LOAM BORROW PER CUBIC YARD				
765.	100	AT SEEDING PER SQUARE YARD				
767.8	20	AT BALES OF HAY FOR EROSION CONTROL PER EACH				
769.	125	AT PAVEMENT MILLING MULCH UNDER GUARDRAIL PER FOOT				
852.	145	AT SAFETY SIGNING FOR TRAFFIC MANAGEMENT PER SQUARE FOOT				
853.2	75	AT TEMPORARY BARRIER (TL-2) PER FOOT				
867.106	140	AT 6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) PER FOOT				
899.*	250	AT WINGWALL FORMLINER PER SQUARE FOOT				
983.*	100	AT DUMPED RIPRAP PER TON				
983.521*	30	AT STREAMBED RESTORATION PER CUBIC YARD				
991.2*	1	AT CONTROL OF WATER PER LUMP SUM				
995.01*	1	AT BRIDGE STRUCTURE, BRIDGE NO. N-25-034 PER LUMP SUM				
999.1*	1	AT POLICE DETAIL PER LUMP SUM				

TOTAL PRICE IN WORDS: _____

BASIS OF AWARD: TOTAL AMOUNT OF BID, BASED ON ENGINEER'S ESTIMATE OF QUANTITIES Sum of all Items

Having examined the Place of the Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by The Town of Norwood, the undersigned, hereby offer to enter into a Contract to perform the Work, **Proposed Bridge Replacement - Westover Parkway over Germany Brook (N-25-034)(C9P)**, for the Price of:

\$ _____ dollars,

(\$ _____) in lawful money of the United States of America and, We have included herewith, the unit price bid forms, and the required security deposit or Bid Bond as required by the Instruction to Bidders.

This project is exempt from all Massachusetts sales taxes.

The undersigned agrees that for extra work, if any, will be performed in accordance with Article 10 of the General Conditions of the Contract and will be paid for in accordance with Article 11 of the General Conditions of the Contract.

The bid security accompanying this BID shall be in the amount of 5 percent of the BID.

If this BID is accepted by the Owner, the undersigned agrees to complete the entire work provided to be done under the Contract within the agreed upon time frame between the Contractor and City stipulated in the AGREEMENT.

As provided in the OPENING AND CONSIDERATION OF BIDS section, the bidder hereby agrees that he will not withdraw this BID within thirty (30) consecutive calendar days after the actual date of the opening of Bids and that, if the Owner shall accept this BID, the bidder will duly execute and acknowledge the AGREEMENT and furnish, duly executed and acknowledged, the required CONTRACT BONDS within ten (10) days after notification that the AGREEMENT and other Contract Documents are ready for signature.

Should the bidder fail to fulfill any of his agreements as hereinabove set forth, the Owner shall have the right to retain as liquidated damages the amount of the bid check or cash which shall become the Owner's property. If a bid bond was given, it is agreed that the amount thereof shall be paid as liquidated damages to the Owner by the Surety.

Bidder has examined copies of all the Contract Documents and the following addenda listed:

Addenda number(s) _____ or circle: N/A
(To be filled in by Bidder if Addenda are issued.)

The time period for holding bids where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays included, after the opening of bids and where Federal approval is required, the time period for holding bids is 30 days, Saturdays, Sundays and legal holidays excluded after Federal approval.

The undersigned must furnish a 100 percent Construction Performance Bond and a 100 percent Construction Payment Bond with a surety company acceptable to the Owner. The name and address of the surety company who will sign the performance and payment bonds is as follows:

The bidder, by submittal of this BID, agrees with the Owner that the amount of the bid security deposited with this BID fairly and reasonably represents the amount of damages the Owner will suffer due to the failure of the bidder to fulfill his agreements as above provided.

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 on the work and that he will comply fully with all laws and regulations applicable to awards made subject to MGL Ch. 30, Section 39M. The bidding and award of the contract will be in full compliance with Section 39M inclusive of Chapter 30 of the General Laws of the Commonwealth of Massachusetts as last revised.

The undersigned further 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 there under.

Pursuant to M.G.L. Ch. 62C, sec. 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

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 attached CERTIFICATE OF NON-COLLUSION must be signed and submitted as part of the Bid Proposal.

(SEAL) _____ L.S. By _____
(Name of Bidder) (Signature and title of authorized
representative)

(Business address)

(City and State)

Date _____

The bidder is a corporation incorporated in the State (or Commonwealth) of _____ - a partnership - an individual. (Bidder must add and delete as necessary to make this sentence read correctly.)

(Note: If the bidder is a corporation, affix corporate seal and give below the names of its president, treasurer, and general manager if any; if a partnership, give full names and residential addresses of all partners; and if an individual, give residential address if different from business address.)

The required names and addresses of all persons interested in the foregoing Bid, as Principals, are as follows:

The bidder is requested to state below what work of a similar character to that included in the proposed Contract he has done and to give references that will enable the Owner to judge his experience, skill, and business standing.

(Add supplementary page if necessary.)

2 CERTIFICATIONS

- 2.1 The bidder by signing the bid, or contract, under penalties of perjury certifies (1) that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed at the work site(s); (2) 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; and (3) that all employees to be employed in the work subject to this bid 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 shall be subject to immediate removal.
- 2.2 Norwood is an Affirmative Action Equal Opportunity Employer. Bidders shall make themselves aware of the existing Affirmative Action laws, policies, and practices before submitting this Bid. Failure to make this confirmation shall not relieve the Bidder of its responsibility.
- 2.3 The undersigned agrees, if awarded the contract, to commence work within ten (10) working days after the award of the contract, and providing suitable performance and payment bonds are received by the General Manager within the time specified in this bid.
- 2.4 Acceptance by the Town shall constitute a Contract between the Town of Norwood and the Bidder.
- 2.5 We/I have carefully examined the contract documents and all five sections (A, B, C, D, & E) including any addenda and changes and agree to furnish the item(s), service(s), material(s), supplies, as specified and described in all sections of the Contract Documents.
- 2.6 We/I accept responsibility for confirming with the Purchasing Department, prior to submission of a sealed Bid that all addenda relating to this Bid have been received. Failure to make this confirmation shall not relieve us/me of the responsibility to fulfill the contract.
- 2.7 We/I, the undersigned, certify 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 the section, the word "person" shall mean any natural person, joint venture, partnership, corporation, or other business or legal entity.
- 2.8 By signing this Bid, the contractor shall certify that under penalties of perjury, the signing party has filed all State tax returns and has paid all State taxes required under law.
- 2.9 The named organizational entity submitting this Bid is (check appropriate line(s)):

Corporation___ Partnership___ Proprietorship
Veteran Owned___ Minority Owned___ Woman Owned

3 SIGNATURES:

This page must be signed by a(n) individual(s) with authority to commit the Bidding entity to a binding agreement. See Section B, paragraph 3.3. Corporations attach required certification:

COMPANY NAME:

AUTHORIZED SIGNATURE:

PRINT NAME OF AUTHORIZED OFFICIAL:

ADDRESS:

TELEPHONE NUMBER: _____ FAX NUMBER:

DATE: _____ FEDERAL TAX ID #

A notarized attestation of the signature(s) is required, or in the case of a corporation, attestation by the Secretary of the Corporation with the corporate seal affixed, that the signature is the signature of an officer authorized to bind the corporation to a contractual agreement. Please complete the attached certificate of vote for corporations.

Accepted and Executed on _____, 20__ by the Town of Norwood by
_____, General Manager.
Tony Mazzucco

4 CHECK LIST

- ___ Have you signed and sealed Section E Pricing & Contract Sections?
- ___ Have you signed and attached any contract addenda or changes?
- ___ Is your Bid Bond enclosed
- ___ Is your company pre-qualified with Mass. DPW?
- ___ Have you signed the Special Provisions page?

CERTIFICATE OF VOTE

I, _____, Clerk of _____, hereby certify that, at a meeting of the Board of Directors of said Corporation duly held on _____, 20____, at which a quorum was present and voting throughout, the following vote was duly passed and is now in full force and effect:

“VOTED: That _____ be and hereby is
(NAME OF OFFICER AUTHORIZED TO SIGN FOR CORPORATION)

authorized, directed and empowered for, in the name and on behalf of this Corporation to sign seal with the corporation seal, execute, acknowledge and deliver all contracts, bonds, and other obligations of this Corporation: the execution of any such contract, bond or obligation by such _____ to be valid and binding upon this Corporation for all purposes, and
(NAME OF OFFICER)

that a certificate of the Clerk of this Corporation setting forth this vote shall be delivered to the Town of Norwood; and that this vote shall remain in full force and effect unless and until the same has been altered, amended, or revoked by a subsequent vote of such directors and a certificate of such later vote attested by the Clerk of this Corporation is delivered to the Town of Norwood.”

I further certify that _____ is the duly elected _____ of said Corporation.
(NAME OF OFFICER) (TITLE)

Signed: _____
(CLERK-SECRETARY)

Place of Business: _____

Date of Contract: _____

AFFIX CORPORATE SEAL HERE

COUNTERSIGNATURE: _____
(NAME AND TITLE OF OFFICER)

In the event that the Clerk or Secretary is the same person as the Officer authorized to sign that contract or other instrument for the Corporation, this certificate must be countersigned by another officer of the Corporation

**Proposed Bridge Replacement
Westover Parkway over Germany Brook (N-25-034) (C9P)
Norwood, MA 02062**

APPENDIX A

PROPOSED CONSTRUCTION DRAWINGS

**Proposed Bridge Replacement
Westover Parkway over Germany Brook (N-25-034) (C9P)
Norwood, MA 02062**

APPENDIX B

ENVIRONMENTAL PERMITS

**Proposed Bridge Replacement
Westover Parkway over Germany Brook (N-25-034) (C9P)
Norwood, MA 02062**

APPENDIX C

RELEVANT TECHNICAL REPORTS & DOCUMENTS

- GEOTECHNICAL ENGINEERING REPORT – DATED 12/31/2020 (PREPARED BY GTR)
- HYDROLOGIC AND HYDRAULIC ANALYSIS – DATED 1/21/2020 (PREPARED BY DUBOIS & KING)
- WETLAND RESOURCE DELINEATION REPORT – DATED 1/7/2020 (PREPARED BY REC)

**Proposed Bridge Replacement
Westover Parkway over Germany Brook (N-25-034) (C9P)
Norwood, MA 02062**

APPENDIX D

PREVAILING WAGE RATES