



CITY OF GREENFIELD
Department of Public Works

CONTRACT DPW 24-01

Nash's Mill Road
12-Inch Water Main Installation

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ADVERTISEMENT FOR BIDDERS
DEPARTMENT OF PUBLIC WORKS
189 Wells Street
Greenfield, MA 01301

Sealed Proposals addressed to the Department of Public Works, 189 Wells Street, Greenfield, Massachusetts and endorsed "Proposal for Contract DPW 24-01, Nash's Mill Rd. 12" Water Main" will be accepted by the Department of Public Works in the Administration Building at the DPW Yard. Bids will be accepted until 2:00 P.M. on Thursday, July 27, 2023 and then at that time, publicly opened and read aloud in the Administration Building Meeting Room.

The work consists of construction and testing of approximately 1,983 linear feet of new 12-inch DICL water main, approximately 150 feet of which will be hung from the Nash's Mill Road Bridge, and related work to include pipe insulation and trench patching.

The Engineer's opinion of probable cost is \$750,000.

Plans, specifications, and proposal forms will be emailed upon request by contacting alan.twarog@greenfield-ma.gov or by downloading them from the City's Procurement Department's webpage at https://greenfield-ma.gov/departments/procurement/current_bid_opportunities.php. To get on the Bidder's List, proposers should contact the DPW at alan.twarog@greenfield-ma.gov or by calling 413-772-1528 x6104. Bid Documents will be available starting July 12, 2023.

The Bid Security from the Contractor in the form of cash, certified check, treasurer's check, or cashier's check, drawn upon a responsible bank in the Commonwealth of Massachusetts or a bid bond in the amount of five percent (5%) of the bid shall be made payable to the City of Greenfield, Massachusetts and shall be enclosed with the bid.

A Performance Bond and a Labor and Materials (Payment) Bond in the full amount of the contract, will be required of the successful bidder.

Attention is called to the following:

- A. Bids for this project are subject to the provisions of the Massachusetts General Laws Chapter 30, Section 39M as amended.
- B. Wages are subject to Massachusetts minimum wage rates as per M.G.L. Chapter 149, Section 26 to 27H inclusive.
- C. All pertinent regulations ordinances and statutes of the City of Greenfield and the State of Massachusetts will be rigidly enforced.
- D. The successful bidder must comply with Chapter 151B as amended, of the Massachusetts General Laws and with the provisions of Executive Order No. 74, as amended by Executive Order No. 116 dated May 1, 1975 pertaining to Equal Opportunity Anti-Discrimination and Affirmative Action.

The responsible and eligible bidder offering the lowest price shall be awarded the project, subject to the availability of funding. The City of Greenfield reserves the right to reject any or all bids or to waive any informalities in the bidding.

The Contract/Bid/Proposal awarding authority is:

City of Greenfield
Department of Public Works
Greenfield, Massachusetts

INFORMATION FOR BIDDERS

INFORMATION FOR BIDDERS

1.1 **Location and work to be done:**

The work herein specified to be done (herein sometimes referred to as the “Work”) consists of construction and testing of approximately 1,983 linear feet of new 12-inch DICL water main on Nash’s Mill Road, approximately 150 feet of which will be hung from the Nash’s Mill Road Bridge, and related work to include pipe insulation and trench patching.

The Contractor shall furnish all labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, and all other items necessary to do all the work required for the completion of the Work, as specified.

The Work to be done and paid for shall not be limited to the extent mentioned or described, but shall include all incidental work necessary or customarily done for the completion of the work.

1.2 **Questions Regarding Drawings and Documents.** In general, no answers will be given to prospective bidders in reply to an oral question if the question involves an interpretation of the intent or meaning of the Drawings or other Contract Documents, or the equality or use of products or methods other than those designated or described on the drawings or in the specifications. Any information given to bidders other than by means of the Drawings and other Contract Documents, including Addenda, as described below, is given informally, for information and the convenience of the bidder only and is not guaranteed. The bidder agrees that such information shall not be used as the basis of nor shall the giving of any such information entitle the bidder to assert any claim or demand against the owner or the engineer on account thereof.

To receive consideration, such questions shall be submitted in writing to the City at least seven (7) days before the established date for receipt of bids. If the question involves the equality or use of products or methods it must be accompanied by drawings, specifications or other data in sufficient detail to enable the City to determine the equality or suitability of the product or method. In general, the City will neither approve nor disapprove particular products prior to the opening of Bids; such products will be considered when offered by the Contractor for incorporation into the Work.

The City will set forth as Addenda, which shall become a part of the Contract Documents, such questions received as above provided as in its sole judgment are appropriate or necessary and its decision regarding each. At least three days prior to the receipt of Bids, the City will send a copy of these Addenda to those prospective bidders known to have taken out sets of the Drawings and other Contract Documents.

The Contractor agrees to use the products and methods designated or described in the Specifications as amended by the Addenda.

- 1.3 **Bidders to Investigate.** Bidders are required to submit their Bids upon the following express conditions which shall apply to and be deemed a part of every Bid received, viz:

Bidders must satisfy themselves by personal examinations of the site of the work and by such other means as they may wish, as to the actual conditions there existing, the character and requirements of the Work, the difficulties attendant upon its execution, and the accuracy of all estimated quantities stated in the Bid.

- 1.4 **Information not Guaranteed.** All information given on the Drawings or in the Contract Documents relating to sub-surface and other conditions, natural phenomena, existing pipes and other structures is from the best sources at present available to the City. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the City does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes or other structures encountered during construction, will be the same as those indicated on the Drawings or in the other Contract Documents.

It is agreed further and understood that no bidder or contractor shall use or be entitled to use any of the information made available to them or obtained in any examination made by them in any manner as a basis of or ground for any claim or demand against the City, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

- 1.5 **Submitting Bids.** All Bids must be upon the blank form for Bid annexed hereto, state the proposed price of each item of the Work, both in words and in figures, and be signed by the Bidder with their business address and place of residence. The Bid Security shall be enclosed with the Bid.

Bidders shall submit their Bids bound with the complete volume of attached Contract Documents, including all pages correctly assembled.

Each bid shall be submitted to the City in a sealed envelope. On the outside of the envelope shall be written the bidder's name and address and the name of and description of the project for which the Bid is submitted.

If forwarded by mail, the sealed envelope containing the Bid and marked as directed above, must be enclosed in another envelope addressed to the City.

- 1.6 **Time for Completion.** The successful bidder will be required to substantially complete the Work no later than **November 15, 2023**. Work cannot begin until after the Greenfield Swimming Area closes on September 4, 2023

- 1.7 **Withdrawal of Bids.** Except as hereinafter in this subsection otherwise expressly provided, once its Bid is submitted and received by the City for consideration and comparison with other bid similarly submitted, the bidder agrees that it may not and will not withdraw it within 40 (forty) consecutive calendar days after the actual date of the opening of Bids.

Upon proper written request and identifications, Bids may be withdrawn as follows:

1. At any time prior to the designated time for the opening of Bids.
2. Provided the Bid has not therefore been accepted by the City at any time subsequent to the expiration of the period during which the bidder has agreed not to withdraw its Bid. Unless a Bid is withdrawn as provided above, the Bidder agrees that it shall be deemed open for acceptance until the City notifies a Bidder in writing that their Bid is rejected or that the City does not intend to accept it. Notice of acceptance of a Bid shall not constitute rejection of any Bid.

- 1.8 **Ability and Experience of Bidder.** No award will be made to any Bidder who cannot satisfy the City that it has sufficient ability and experience in this class of work and sufficient capital and plant to enable it to prosecute and complete the Work successfully within the time named. The City decision or judgment on these matters shall be final, conclusive, and binding.

The Bidder is to submit a list of all projects completed within the past five years to include the name of the project, brief description of the project, cost of the project, and contact name and phone number.

The City may make such investigations as it deems necessary, and the Bidder shall furnish to the City, under oath if so required, all such information, and data for this purpose as the City may request.

- 1.9 **Bids.** The City may reject Bids which in its sole judgment are either incomplete, conditional, obscure or not responsive or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities, or the City may waive such omissions, conditions or irregularities.
- 1.10 **Right to Reject Bids.** The City reserves the right to reject any or all Bids, or Alternate Bid Items should the City deem it to be in the public interest to do so.
- 1.11 **Execution of Agreement.** The Bidder whose bid is accepted will be required and agrees to duly execute the AGREEMENT, after notification that the AGREEMENT is ready for signature.
- 1.12 **Insurance Certificates.** The Contractor will not be permitted to start any construction work until it has submitted certificates covering all insurance called for, and has obtained approval in writing of such certificates from the City.

Before starting, and until completion of the guarantee period, the Contractor shall procure, deposit, and maintain with the City, insurance satisfactory to the City as follows:

- A. Workmen's Compensation and Employer's Liability Insurance as required by the Workmen's Compensation Laws of the Commonwealth of Massachusetts.
- B. Comprehensive Commercial Liability Insurance covering Bodily Injury and Property Damage (Broad Form) as follows:

Limits of Liability*	\$1,000,000 each occurrence
	\$2,000,000 aggregate

* or \$1,000,000 single limit combined Bodily Injury and Property Damage.

The Comprehensive Commercial Liability Policy shall provide insurance for the Contractor for Bodily Injury and Property Damage to third persons arising out of:

1. Work performed by the Contractor itself with its own employees, called "premises operations."
2. Work performed by its subcontractors, called "sublet work" or Independent Contractors (this is referred to as Contractor's Protective Liability).
3. The Contractor's liability assumed under this contract, called "Hold Harmless" clauses or indemnity agreement. (This is referred to as Contractual Liability Insurance).
4. Products liability coverage covering the completed building or installation or products furnished. (This is called Products Liability Insurance for the manufacturer and Complete Operations Liability Insurance for the Contractor).
5. If any work is to be performed below the surface of the ground, the coverage shall be extended to include protection against property damage caused by explosion (including blasting), collapse of structures and damage to underground pipes and utilities. (This is known as "XCU" coverage).

- C. Comprehensive Automobile Liability Insurance covering Bodily Injury and Property Damage, as follows:

Limits of Liability

Bodily Injury	\$500,000 each person \$1,000,000 each accident
Property Damage	\$1,000,000 each accident

* or \$500,000 single limit combined Bodily Injury and Property Damage.

This insurance is to apply with respect to all owned or hired vehicles of the Contractor and non-ownership protection for all employees of the Contractor engaged in the performance of this contract.

D. All policies shall be so written that the City will be notified of cancellation or restrictive amendment at least 30 days prior to the effective date of such cancellation or amendment. Certificates from the insurance carrier stating the limits of liability and expiration date shall be filed in triplicate with the City before operations are begun. Such certificates not only shall name the types of policy provided, but also shall refer specifically to this Contract* and article and the above paragraphs in accordance with which insurance is being furnished and shall state that such insurance is as required by such paragraphs of this Contract and shall be sufficiently comprehensive as to permit the owner to determine that the required insurance coverage has been provided without the necessity of examining the individual insurance policies.

If the initial insurance expires prior to completion of the Work, renewal certificates shall be furnished by the date of expiration.

* If blanket coverage is furnished, this particular Contract need not be referred to.

E. The Contractor shall require each of its sub-contractors to procure and maintain until the completion of that sub-contractor's work, insurance of the types and to the limits specified in paragraphs A to C, inclusive, above. It shall be the responsibility of the Contractor to insure that all its sub-contractors comply with all of the insurance requirements contained herein relating to such sub-contractors.

No insurances required or furnished hereunder shall, in any way, relieve the Contractor of, or diminish any of its responsibilities, obligations and liabilities under the Contract.

1.13 **Comparison of Bids.** Bids will be compared on the basis of lump-sum or unit prices stated in the BID.

In the event that there is a discrepancy in the Bid between the lump-sum or unit prices written in words and figures, the prices written in words shall govern.

The City agrees to examine and consider each Bid submitted in consideration of the Bidder's agreements, as hereinabove set forth and as set forth in the BID.

1.14 **Bid Security.** The Bid Security from the contractor in the form of cash, certified check or treasurer's or cashier's check drawn upon a responsible bank in the Commonwealth of Massachusetts or a bid bond in the amount of five percent (5%) of the bid shall be made payable to the City of Greenfield, Massachusetts and shall be enclosed with the bid.

Each such check may be held by the City as security for the fulfillment the bidder's agreements as hereinabove set forth and as set forth in the BID. Should the bidder fail to fulfill such agreements, its bid check shall become the property of the City as liquidated damages; otherwise, the bid check shall be returned to the bidder as hereinafter provided.

Bid checks will be returned to all except the three lowest bidders within three days, Sundays and legal holidays excluded, after the owner and the accepted bidder have executed the AGREEMENT. In the event that the AGREEMENT has not been executed by both the accepted bidder and the owner within 30 consecutive calendar days after the opening of bids, the bid check will be returned promptly upon demand of any bidder who has not been notified of the acceptance of his bid.

None of the three lowest bids shall be deemed rejected, notwithstanding acceptance of any bid, until the AGREEMENT has been executed by both the City and the accepted bidder.

The bid deposit must be enclosed in the sealed envelope containing the bid.

- 1.15 All questions relative to the specifications shall be directed to:

Alan Twarog
189 Wells Street
Greenfield, MA 01301
413-772-1528 x6104
alan.twarog@greenfield-ma.gov

- 1.16 **Disputes.** In the event of any dispute as to any of the terms and conditions of this Contract, it shall be determined in accord with the laws of the Commonwealth of Massachusetts and the Courts of the Commonwealth of Massachusetts shall have exclusive jurisdiction of the same.
- 1.17 **Minimum Wage Rates.** In the employment of mechanics, teamsters, chauffeurs, and laborers in the construction of the public work projects, the Minimum Wage rates shall be paid as issued by the Commissioner of Labor and Industries of Massachusetts, in accordance with Sections 26 and 27 of Chapter 149, of the General Laws, as amended, and as included in Appendix A.
- 1.18 **Equal Employment Opportunity Anti-Discrimination and Affirmative Action.** The successful bidder must comply with Chapter 151B as amended, of the Massachusetts General Laws and with the provisions of Executive Order No. 74, as amended by Executive Order No. 116 dated May 1, 1975 pertaining to Equal Opportunity Anti-Discrimination and Affirmative Action.
- 1.19 **Price Adjustments.** This Contract contains price adjustments for hot mix asphalt cement mixtures, diesel fuel, and gasoline. For this project the base prices are as follows: liquid asphalt \$657.50 per ton, diesel fuel \$2.826 per gallon, and gasoline \$2.852 per gallon. Period prices can be found on the MassDOT website under Permits, Forms & Publications,

Construction Publications at <http://www.mhd.state.ma.us/>. Price adjustments are further explained in the Special Conditions.

- 1.20 **Notice to Proceed and Pre-Construction Conference.** A written Notice to Proceed shall be issued to the Contractor after receipt of the proof of required insurance. No work shall be performed by the Contractor until it has received the Notice to Proceed.

Prior to the start of construction, the Contractor, all subcontractors, the project manager, and the owner shall attend a pre-construction conference. The conference will serve to acquaint the participants with the general plan of contract administration and requirements under which the construction operation is to proceed.

The date, time, and place of the conference will be furnished to the Contractor by the project manager.

- 1.21 **Bonds.** Performance, as well as Labor and Material (Payment) Bonds are required in the full amount of the Contract. The Bonding Company shall be acceptable to the Awarding Authority.

FORMS FOR BID

Bid Submission Checklist for all Bidders

1. _____ **5% Bid Deposit**
2. _____ **Proposal Form**
3. _____ **Non-collusion/Tax Compliance Certification**
4. _____ **Debarment Statement**
5. _____ **Contractor's Certification**
6. _____ **Sub-Contractor's Certification**
7. _____ **OSHA Training Certification**
8. _____ **List of all projects of similar scope with contact information done within the past 5 years**

Bidder's Name

PROPOSAL FORM

To the City of Greenfield, Massachusetts, (hereinafter called the "Owner") acting through its Department of Public Works, duly authorized therefore, who act solely for said City and without personal liability to themselves:

The undersigned _____, as bidder, declares that the only persons or parties interested in this bid as principals are those named herein; that the bidder has carefully examined the proposed form of Proposal and the Specifications (and amendments thereto); and the bidder bids and agrees, if this bid is accepted, that it will furnish all materials and labor necessary for the completion of the Work as specified in the Proposal, in the manner and time therein prescribed and according to the requirements of Owner as herein set forth.

The Bidder agrees that the Owner will have forty (40) consecutive days from date of opening to accept the bid, except as described in the specifications, the unit(s) at the price, therein. The Bidder also understands that the Owner reserves the right to accept or reject any or all bids and to waive any informalities in the Proposals if it is in the Owner's interest to do so. The Advertisement for Bidders, Information for Bidders, Specifications and Proposal Form attached thereto, shall become a contract upon the receipt by the Bidder of written acceptance of this bid by the Owner.

The Bidder will take in full payment, therefore, the following price, to wit:

Item Number	Estimated Quantity	Brief Description; unit or lump-sum price bid in both words and figures	Total in Figures
1	1 L.S.	Mobilization/De-Mobilization (Not to exceed 5% of the total BID price) _____dollars and _____cents (\$_____)	\$_____
2	4 EA.	Silt Sack (Catch Basin Protection) _____dollars and _____cents (\$_____)	\$_____

3	800 C.Y.*	Earth Excavation (Unsuitable Materials)	_____dollars	and _____cents (\$_____)	\$_____
4	100 C.Y.*	Rock Removal (Ledge)	_____dollars	and _____cents (\$_____)	\$_____
5	600 C.Y.*	Gravel Borrow	_____dollars	and _____cents (\$_____)	\$_____
6	1,880 L.F.	12" DICL, Class 52 Water Pipe w/Bronze Wedges	_____dollars	and _____cents (\$_____)	\$_____
7	105 L.F.	12" DICL, Class 52 Water Pipe w/Insulation & Jacket & Bronze Wedges	_____dollars	and _____cents (\$_____)	\$_____
8	5 EA.	12" 45 Degree MJ Bend	_____dollars	and _____cents (\$_____)	\$_____
9	5 EA.	12" 22.5 Degree MJ Bend	_____dollars	and _____cents (\$_____)	\$_____

10	5 EA.	LB&A Double Roller Assembly S.S.		
		_____dollars		
		and _____cents (\$_____)	\$_____	
11	5 EA.	2" Pipe Saddle		
		_____dollars		
		and _____cents (\$_____)	\$_____	
12	5 EA.	20" x 9" x 3/4" A36 Plate Galv.		
		_____dollars		
		and _____cents (\$_____)	\$_____	
13	5 EA.	10 1/2" x 10 1/2" x 1/2" A36 Plate Galv.		
		_____dollars		
		and _____cents (\$_____)	\$_____	
14	35 EA.	A325 3/4" Bolt, Nut, Washers Galv.		
		_____dollars		
		and _____cents (\$_____)	\$_____	
15	1 C.Y.	4000 PSI, 11/2", 565 Cement Concrete		
		_____dollars		
		and _____cents (\$_____)	\$_____	
16	220 LB.	A615 GR 60 Steel Reinforcing		
		_____dollars		
		and _____cents (\$_____)	\$_____	

17	4 L.F.	16" Dia. Galv. Pipe Sleeve	_____dollars	and _____cents (\$_____)	\$_____
18	4 EA.	Casing Spacer	_____dollars	and _____cents (\$_____)	\$_____
19	4 EA.	Link Seal	_____dollars	and _____cents (\$_____)	\$_____
20	1 TON	SPC-B-12.5 Superpave	_____dollars	and _____cents (\$_____)	\$_____
21	20 S.F.	1" Closed Cell Foam	_____dollars	and _____cents (\$_____)	\$_____
22	5 S.Y.	Bituminous Damp Proofing	_____dollars	and _____cents (\$_____)	\$_____
23	1 C.Y.	Reinforced Concrete Excavation	_____dollars	and _____cents (\$_____)	\$_____

24	1,250 S.Y.	Permanent Trench Patch in Roadway
		_____dollars
		and _____cents (\$_____)
		\$_____

* Indeterminate quantity assumed for comparison of Bids.

If this BID is accepted by the City, the undersigned agrees to complete the entire work provided to be done under the Contract within the time stipulated under INFORMATION FOR BIDDERS or as otherwise expressly provided in the AGREEMENT.

The total price for the base bid (Items 1-24), derived as described in the INFORMATION FOR BIDDERS under the heading "Comparison of Bids," is \$**_____.
 _____.(in words)

As provided in the INFORMATION FOR BIDDERS, the bidder hereby agrees that it will not withdraw this BID within 30 consecutive calendar days after the actual date of the opening of BIDS and that, if the City 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 its agreements as hereinabove set forth, the City shall have the right to retain as liquidated damages the amount of the bid check which shall become the City's property.

This BID includes Addenda number *** _____, _____, _____, _____, _____.

** Bidder must fill in this blank

*** To be filled in by Bidder if Addenda are issued

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 its agreements as above provided.

The Bidder hereby certifies it shall comply with the minority manpower ration and specific action steps contained in the STATE REQUIREMENTS under Massachusetts Equal Employment Program, including the minority contractor compliance. Prior to the award of the Contract, the Contractor must submit a Contractor's Certification of Compliance. The Contractor receiving the award of the Contract shall be required to obtain from each of its Sub-Contractors and submit to the contracting or administering agency prior to the performance of any work under said Contract a certification by said Sub-Contractor, regardless of tier, that it will comply with the minority manpower ratio and specific affirmative action steps contained in the Massachusetts Equal Employment Program.

(SEAL)

Name of Bidder

By _____
(Signature and title of authorized representative)

(Business Address)

(City & State)

Date _____

The Bidder is a corporation incorporated in the State (or Commonwealth) of _____
_____(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.)

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature of individual submitting bid or proposal

Name of Business

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. Ch. 62C, Sec. 49A, I certify under the penalties of perjury that I, to the best of my knowledge and belief, am in compliance with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Signature of individual submitting bid or proposal

Name of business

DEBARMENT STATEMENT
(to be used for any public construction project)

Any person or corporation that fails to date, sign with original signature, and submit the following statement shall not be awarded this contract.

DEBARMENT (Chapter 550, Acts of 1991)

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

DATE: _____

Typed or Printed Name of Person Signing

Authorized Official's Signature

Company or Corporation

A. Contractor's Certification

Name of Project _____

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTOR'S CERTIFICATION

_____ certified that:

1. it tends to use the following listed construction trades in the work under the contract _____

and

2. will comply with the minority manpower ration and specific affirmative action steps required by law, and
3. will obtain from each of its Sub-Contractors and submit to the contracting or administering agency prior to the award of any Sub-Contract under this contract the Sub-Contractor certification required by these bid conditions.

Signature of authorized representative
of Contractor.

B. Sub-Contractor's Certification

Name of Project _____

Prior to the award of any sub-contract, regardless of tier, the prospective sub-contractor must execute and submit to the prime contractor the following certification, which will be deemed a part of the resulting sub-contract:

SUB-CONTRACTOR'S CERTIFICATION

_____ certifies that:

1. it tends to use the following listed construction trades in the work under the sub-contract _____

and;

2. will comply with the minority manpower ration and specific affirmative action steps required by law; and
3. will obtain from each of the sub-contractors prior to the award of any sub-contract under this sub-contractor certification required by these bid conditions.

Signature of Authorized Representative

In order to ensure that the said sub-contractor's certification becomes a part of all sub-contractors under the prime contract, no sub-contract shall be executed until an authorized representative of the City agency (or agencies) administering this project has determined, in writing, that the said certification has been incorporated in such sub-contract, regardless of tier. Any sub-contract executed without such written approval shall be void.

OSHA TRAINING CERTIFICATION

Pursuant to M.G.L. Ch. 30, Sec. 39S(A), I certify under the penalties of perjury to the following:

- (1) that I am able to furnish labor that can work in harmony with all other elements of labor employed or to be employed at the work;
- (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 contract 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.

(Signature of authorized representative of Bidder)

(Name of authorized representative of Bidder)

(Name of business)

AGREEMENT

AGREEMENT FOR CONTRACT DPW 24-01

Nash's Mill Road 12-Inch Water Main Installation

THIS AGREEMENT, executed this _____ day of _____
in the year Two Thousand and Twenty-Three.

(herein referred to as the "AGREEMENT"), by and between the City of Greenfield, Massachusetts, acting by and through its Department of Public Works, duly authorized therefore, which acts solely for said City and without personal liability to itself, party of the first part, and _____ party of the second part.

WITNESSETH, that the parties to these presents, each in consideration of the undertakings, promises, and agreements on the part of the other herein contained, have undertaken, promised and agreed and do hereby undertake, promise, and agree, the party of the first part for itself, its successors and assigns, and the party of the second part for itself and its heirs, executors, administrators, successors and assigns, as follows:

The Contractor agrees to furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished and delivered in and about the improvement and to do and perform all work in accordance with the specifications, plans and conditions made a part hereof, and in strict conformity with the provisions herein contained. All said Plans, Specifications, General Requirements, Special Provisions, Addenda, and Proposal are hereby specifically made a part of this Contract as fully and to the same effect as if the same had been set forth at length herein.

The Contract Documents consist of the following:

1. This Agreement
2. Bidding/Contract Documents DPW 24-01, inclusive
3. Drawings consisting of sheets numbered 1 through 9 inclusive, with each sheet bearing the following general title: Nash's Mill Road 12" Water Main Installation AND Drawings consisting of sheets numbered 1 through 4 inclusive, with each sheet bearing the following general title: Proposed Water Main Bridge Attachment
4. Contractor's Bid Proposal
5. Performance Bond
6. Payment Bond
7. Addenda (numbers _____ to _____ inclusive)

In consideration of the foregoing premises, the Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything furnished and done by the Contractor under this Contract; including all work required, but not shown on the plans for the items herein mentioned, and for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any delay or from any unforeseen obstruction or difficulty encountered in the prosecution of the Work, and for all risks of every description connected with the Work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the Work as herein specified, and for well and faithfully completing the Work, and the whole thereof, as herein provided, such price or prices as are set

AGREEMENT FOR CONTRACT DPW 24-01

Nash's Mill Road 12-Inch Water Main Installation

out in the accompanying proposal, and for all work required, for which there is no item in the proposal, such compensation as is provided for in the aforesaid specification.

The Contractor's original bid price for this project is _____.

IN WITNESS WHEREOF, the Owner has caused this instrument to be signed and its corporate seal to be hereto affixed in its behalf, and the Contractor has caused this instrument to be signed in its behalf.

FOR THE OWNER,

By the _____

FOR THE CONTRACTOR,

Witness: _____

By the _____

(If a corporation, attach to each signed Agreement a notarized copy of the corporate vote authorizing the signatory to sign this Agreement.)

Approved as to Appropriation:

City Accountant

Certificate of Acknowledgment of Contractor if a Corporation

For AGREEMENT

State of _____)

SS:

County of _____)

On this _____ day of _____, 20____,

before me personally came _____

to me known, who being by me duly sworn, did depose and say as follows:

That he/she resides at _____

and is the _____

of _____

the corporation described in and which executed the foregoing instrument; that he/she knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order he/she signed thereto his/her name and official designation.

Notary Public (Seal)

My commission expires: _____

NOTICE TO PROCEED

Date: _____

Project: Nash's Mill Road 12-Inch Water Main Installation

Owner: City of Greenfield, MA

Owner's Contract No.: DPW 24-01

Contract: Nash's Mill Road 12-Inch Water Main Installation

Contractor:

Contractor's Address:

You are notified that the Contract Times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. The date of Substantial Completion is November 15, 2023.

Before you may start any Work at the Site, Paragraph 1.12 of the Information for Bidders provides that you must deliver to the Owner (with copies to Engineer and other identified additional insured and loss payees) certificates of insurance which Contractor is required to purchase and maintain in accordance with the Contract Documents.

Owner

Given by:

Authorized Signature

Title

Date

Copy to Engineer

BONDS

PERFORMANCE BOND

(NOTE: This Bond is issued simultaneously with the attached Labor and Materials Bond in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, _____

(an individual, a partnership, a corporation)

duly organized under the Laws of the State (or Commonwealth) of _____,

and having a usual place of business at _____,

as Principal, and _____, a corporation

duly organized under the Laws of the State (or Commonwealth) of _____,

and having a usual place of business at _____,

as Surety, are holden and stand firmly bound and obligated unto the City of Greenfield,

Massachusetts, as obligee, in the sum of _____,

lawful money of the United States of America to and for the true payment whereof we bind

ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly

and severally, firmly by these presents.

WHEREAS, the Principal, by means of a written AGREEMENT (which together with the Contract Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract") dated _____.

Has entered into a contract with the said obligee for _____

a copy of which AGREEMENT is attached hereto and by reference made a part hereof.

NOW THEREFORE, THE CONDITION of this obligation is such that if the Principal shall well and truly keep and fully and faithfully perform all of the terms and conditions of said AGREEMENT and of the "Contract Documents" referred to in said AGREEMENT (which collectively are hereinafter and in said AGREEMENT sometimes referred to as the "Contract") and all modifications thereof on the Principal's part to be performed, this obligation shall be void; otherwise it shall remain in full force and effect.

Whenever the said Principal shall be, and declared by the City to be in default under the said Contract, the City having performed the City's obligations thereunder, the Surety, for value received, shall promptly remedy the default, or, at the option of the City, shall promptly

- (a) Complete the said AGREEMENT and/or Contract in accordance with its terms and conditions, or
- (b) Obtain a bid or bids for submission to and the approval of the City for completing the said AGREEMENT and/or Contract and any modifications thereof in accordance with the terms and condition thereof, and upon determination by the City and the Surety of the lowest responsible and acceptable bidder, arrange for a contract between such bidder and the City, and make available to the City as the Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less a sum that shall be equal to the difference between the Contract price as fixed and provided in said AGREEMENT and/or Contract price as fixed and provided thereof to be paid thereunder to the Principal and the amount previously paid by the City to and/or for the account of and/or chargeable against the Principal, but not exceeding (including other costs and damages for which the Surety may be liable hereunder) the amount set forth in the first paragraph hereof.

The Surety, for value received, agrees further that no changes in, omissions from, or alteration, modifications or additions to the terms and provisions of said AGREEMENT, and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way affect the Surety's obligations on this Bond, and the Surety hereby waives notice of any such changes, omissions, alteration, modification, additions or extensions.

IN WITNESS WHEREOF, we have hereunto set our hands and seals to _____
 counterparts of this Bond, this _____ day of _____
 in the year Two Thousand and Twenty-Three.

 Principal (Seal)

 Principal (Seal)

 Principal (Seal)

 Surety (Seal)

 Surety (Seal)

 Surety (Seal)

(NOTE: If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his/her power of attorney showing his/her authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the Bond corresponding to the number of counterparts of the AGREEMENT.)

LABOR AND MATERIALS (PAYMENT) BOND

(NOTE: This Bond is issued simultaneously with the attached Performance Bond in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, _____

(an individual, a partnership, a corporation)

duly organized under the Laws of the State (or Commonwealth) of _____,

and having a usual place of business at _____,

as Principal, and _____, a corporation

duly organized under the Laws of the State (or Commonwealth) of _____,

and having a usual place of business at _____,

as Surety, are holden and stand firmly bound and obligated unto the City of Greenfield,

Massachusetts, as obligee, in the sum of _____,

lawful money of the United States of America to and for the true payment whereof we bind

ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly

and severally, firmly by these presents.

WHEREAS, the Principal, by means of a written AGREEMENT (which together with the Contract Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract") dated _____.

Has entered into a contract with the said obligee for _____

a copy of which AGREEMENT is attached hereto and by reference made a part hereof.

NOW, THEREFORE, THE CONDITION of this obligation is such that if the Principal shall promptly make payments to all claimants as hereinafter defined, for all labor performed or furnished and for all materials and equipment furnished for or used or in connection with the Work called for by said AGREEMENT and/or Contract and any modifications thereof, including lumber used, but not incorporated in said Work, and for the rental or hire of vehicles, tools and other appliances and equipment furnished for or used in connection with said Work, this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the Principal or with a subcontractor of the Principal for labor, materials, and/or equipment used or

- reasonably required for use in the performance of the said Work, labor and materials, being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the said AGREEMENT and/or Contract and any modifications thereof.
2. The above named Principal and Surety hereby jointly and severally agree with the City that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials or equipment were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The City shall not be liable for the payment of any costs or expenses of any such suit.
 3. No suit or action shall be commenced hereunder by a claimant,
 - (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the City or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials or equipment for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials or equipment were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, City, or Surety at any place where an office is regularly maintained for the transaction of business, or served in the state in which the said Work is located, save that such service need not be made by a public officer;
 - (b) After the expiration of one (1) year following the date on which the Principal ceased work on said AGREEMENT and/or Contract and any modifications thereof, it being understood, however, that if any limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
 - (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the said Work, or any part thereof, is situated, or in the United States District Court for the district in which the said Work, or any part thereof, is situated, and not elsewhere.
 4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said AGREEMENT and/or Contract or said Work, whether or not claim for the amount of such lien be presented under and against this bond.

The Surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time

given or changes made in the manner or time of making payments thereunder, shall in any way affect the Surety's obligations on this Bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.

IN WITNESS WHEREOF, we have hereunto set our hands and seals to _____
counterparts of this Bond, this _____ day of _____
in the year Two Thousand and Twenty-Three.

(NOTE:

If the Principal (Contractor)
is a partnership, the Bond
should be signed by each of the
partners.

_____(Seal)
Principal

_____(Seal)
Principal

If the Principal (Contractor)
is a corporation, the Bond
should be signed in its correct
corporate name by its duly
authorized officer or officers.

_____(Seal)
Principal

If this Bond is signed on
behalf of the Surety by an
attorney-in-fact, there should
be attached to it a duly certi-
fied copy of his/her power of
attorney showing his/her authority
to sign such Bonds.

_____(Seal)
Surety

_____(Seal)
Surety

There should be executed an
appropriate number of counter-
parts of the Bond corresponding
to the number of counterparts of
the AGREEMENT.)

_____(Seal)
Surety

Certificate of Acknowledgment of Contractor if a Corporation

For CONTRACT BONDS

State of _____)

SS:

County of _____)

On this _____ day of _____, 20____,

before me personally came _____

to me known, who being by me duly sworn, did depose and say as follows:

That he/she resides at _____

and is the _____

of _____

the corporation described in and which executed the foregoing instrument; that he/she knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order he/she signed thereto his/her name and official designation.

Notary Public (Seal)

My commission expires: _____

SPECIAL CONDITIONS

SPECIAL CONDITIONS

TITLE

- 1.1 Construction Warning Signs
- 1.2 Traffic Control
- 1.3 Traffic Control Signs
- 1.4 Access to Property
- 1.5 Conflict or Inconsistency
- 1.6 Percentage of Progress Payments to be Retained
- 1.7 Liquidated Damages
- 1.8 Monthly Price Adjustment for HMA Mixtures
- 1.9 Monthly Price Adjustment for Diesel Fuel and Gasoline
- 1.10 Work Schedule
- 1.11 Construction Plan

- 1.1 **Construction Warning Signs.** All construction warning signs shall be erected in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways. All construction warning signs shall be erected and maintained by the Contractor at its own expense.

- 1.2 **Traffic Control.** For control of moderate traffic, the Contractor shall provide an adequate number of flagmen employed at its own expense.

Whenever and wherever, in the opinion of the Owner, traffic is sufficiently congested or public safety is endangered, the Contractor shall be responsible for furnishing uniformed special officers to direct traffic and to keep traffic off the highway area affected by construction operations. Such officers shall be in addition to the watchmen, required under other provisions of the Contract. The Owner shall be responsible for payment of all uniformed special officers. The Contractor shall be responsible for scheduling all uniformed special officers with the Greenfield Police Dispatch at 413-773-5411 a minimum of 24 hours in advance. When scheduling, the Contractor shall inform Police Dispatch that they are working on behalf of the City of Greenfield DPW and all invoices shall be sent to 189 Wells Street. Cancellations require a minimum 4 hour notice.

The employment or presence of traffic flagmen, special officers, or police shall, in no way, relieve the Contractor of any responsibility or liability, which is its under the terms of the Contract.

- 1.3 **Traffic Control Signs.** The Contractor shall provide traffic control signage as required to include detour and road closing signs. Where streets are to be closed, detour signage will be set up by the Contractor at the direction of the Engineer. Where one-lane traffic is required, signage will be placed in accordance with the M.U.T.C.D.

- 1.4 **Access to Property.** The Contractor shall maintain access to all properties whether over sidewalks or driveways through the use of ramps, bridges, or steel plating. Bridging is required for all properties where handicap accessibility must be maintained.

Temporary handicap ramps shall be constructed according to the Commonwealth of Massachusetts Architectural Barrier Board Regulations 521 CMR.

- 1.5 **Conflict or Inconsistency.** If there be any conflict or inconsistency between the provisions of the SPECIAL CONDITIONS and the provisions of the other Contract Documents, the provision of the SPECIAL CONDITIONS shall prevail. If there be any conflict or inconsistency between the provisions of the AGREEMENT and the provisions of any of the Contract Documents other than the SPECIAL CONDITIONS, the provisions of the AGREEMENT shall prevail.
- 1.6 **Percentage of Progress Payments to be Retained.** The percentage of value to be retained under that Subsection of the GENERAL CONDITIONS, entitled “Progress Payments,” shall be 5 percent.
- 1.7 **Liquidated Damages.** The Contractor and Owner recognize that time is of the essence and that the Owner will suffer financial loss if the Work is not completed within the specified, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, the Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), the Contractor shall pay the Owner \$500 for each day that expires after the time specified.
- 1.8 **Monthly Price Adjustment for Hot Mix Asphalt (HMA) Mixtures.** The Price Adjustment for HMA will be based on the variance in price for the liquid asphalt component only from the Base Price, which is listed in the Information for Bidders, to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

The Period Price will be based on the “New Asphalt Period Price Method” posted each month on the MassDOT website at <http://www.mhd.state.ma.us/>. The “New Asphalt Period Price Method” is for contracts bid after December 15, 2008 and will show the Period Price of liquid asphalt for each monthly period as determined by MassDOT using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer’s terminal, as listed under the “East Coast Market – New England, Boston, Massachusetts area” section of the Poten & Partners, Inc. “Asphalt Weekly Monitor”. Poten and Partners has granted MassDOT the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

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

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job. The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of tons of hot mix asphalt mixtures placed

during each monthly period times the liquid asphalt content percentage times the variance in price between Base Price and Period Price of liquid asphalt. This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments. No Price Adjustment will be allowed beyond the completion date of this Contract, unless there is an approved extension of time.

- 1.9 **Monthly Price Adjustment for Diesel Fuel and Gasoline.** This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price, which is listed in the Information for Bidders, to the Period Price.

The Period Price of diesel fuel and gasoline will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month. This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments. No Price Adjustment will be allowed beyond the completion date of this Contract, unless there is an approved extension of time.

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

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

ITEMS COVERED	FUEL FACTORS	
	Diesel	Gasoline
Excavation and Borrow Work:	0.29 Gallons/CY	0.15 Gallons/CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons/Ton	Does Not Apply

- 1.10 **Work Schedule.** The Contractor shall perform all Work between the hours of 7:00a.m. to 3:30p.m., Monday through Friday. No work shall be allowed on weekends or holidays unless prior approval is granted by the Engineer/Owner.
- 1.11 **Construction Plan.** One week before commencement of construction, the Contractor shall present a construction plan, in writing, outlining a proposed schedule, hours of operation, sequence of operations and uniformed special officer needs.

GENERAL CONDITIONS

GENERAL CONDITIONS

TITLE

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1.2	Obligations and Liability of Contractor.....
1.3	Planning and Progress Schedules.....
1.4	Supervision of Work.....
1.5	Patents.....
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1.40	Liability of City.....
1.41	Guarantee.....
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1.43	Legal Address of Contractor.....
1.44	Modification of Termination.....

- 1.1 **Definitions.** Wherever the words hereinafter defined or pronouns used in their stead occur in the Contract Documents, they shall have the following meanings:

The word "Owner" shall mean the City of Greenfield.

The word "Contractor" shall mean the party of the second part above designated.

The word "Specifications" when used herein shall be deemed to refer to both the General and Technical Specifications.

The words "herein", "hereinafter", hereunder" and words of like import shall be deemed to refer to the Contract Documents.

- 1.2 **Obligations and Liability of Contractor.** The Contractor shall do all the work and perform and furnish all the labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies and all other things (except as otherwise expressly provided herein) necessary and as herein specified for the proper performance and completion of the Work in the manner and within the time hereinafter specified, in strict accordance with the Specifications and other Contract Documents, in conformity with the directions and to the satisfaction of the City, and at the prices herein agreed upon.

All parts of the Work and all fixtures, equipment, apparatus and other items indicated in the Specifications and all work and material usual and necessary to make the Work complete in all its parts, including all incidental work necessary to make it complete and satisfactory and ready for use and operation, whether or not they are mentioned in the Specifications, shall be furnished and executed the same as if they were called for by the Specifications.

The Contractor shall conduct its work so as to interfere as little as possible with private business and public travel. Wherever and whenever necessary or required, the Contractor shall maintain fences, furnish watchmen, maintain lights, and take such other precautions as may be necessary to protect life and property.

The Contractor shall indemnify and save harmless the City and its officers, agents, servants, and employees from and against any and all claims, demands, suits, proceedings liabilities, judgments, awards, losses, damages, costs and expenses, including attorney's fees, on account of bodily injury, sickness, disease or death sustained by any person or persons or injury or damage to or destruction of any property, directly or indirectly arising out of, relating to or in connection with the Work, whether or not due or claimed to be due in whole or in part to the active, passive or concurrent negligence or fault of the Contractor, its officers, agents, servants or employees, any of its subcontractors, the City or any of its respective officers, agents, servants or employees and/or any other person or persons, and whether or not such claims, demands, suits or proceedings are just, unjust, groundless, false or fraudulent; and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits and proceedings.

The Contractor shall have complete responsibility for the Work and the protection thereof, and for preventing injuries to persons and damage to the Work and property and

utilities on or about the Work, until final completion and final acceptance thereof. The Contractor shall, in no way, be relieved of its responsibility by any right of the City to give permission or directions relating to any part of the Work, by any such permission or directions given, or by failure of the City to give such permission or directions. The Contractor shall bear all costs, expenses, losses and damages on account of the quantity or character of the Work or the nature of the land (including but not limited to subsurface conditions) in or under or on which the Work is done being different from those indicated or shown in the Contract Documents or from what was estimated or expected, or on account of the weather, elements, or other causes.

The Contractor shall conduct its operations so as not to damage existing structures or work installed either by it or by other contractors. In case of any such damage resulting from its operations, the Contractor shall repair and make good as new the damaged portions at its own expense with the consent of the damaged party. In the event that consent is not given, the Contractor shall continue to be liable for the damage caused.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, their officers, agents, servants and employees as it is for its own acts and omissions and those of its officers, agents, servants and employees.

Should the Contractor sustain any loss, damage or delay through any act or omission of any other contractor or any subcontractor of any such other contractor, the Contractor shall have no claim against the City therefore, other than for any extension of time, but shall have recourse solely to such other contractor or subcontractor.

If any other contractor or any subcontractor of any such other contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the Contractor or of any of its subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other contractor or subcontractor for such loss or damage. The Contractor agrees to and does hereby indemnify and save harmless the City from and against any and all claims by such other contractors or subcontractors alleging such loss, damage or delay and from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys' fees, arising out of, relating to or resulting from such claims.

The Contractor shall promptly pay all federal, state and local taxes which may be assessed against it in connection with the Work or its operations under the AGREEMENT and/or the other Contract Documents, including but not limited to, taxes attributable to the purchase of material and equipment, to the performance of services, and the employment of persons in the prosecution of the Work.

- 1.3 **Planning and Progress Schedules.** The Contractor shall submit to and for the approval of the Engineer, a detailed schedule of operations. The schedule shall show the proposed methods of construction and sequence of work and the time the Contractor proposes to complete the various items of work within the time specified in the Contract. No work shall begin until the Progress Schedule is approved by the Engineer.

If the Contractor's operations are materially affected by changes in the plans or in the quantity of the Work or if it has failed to comply with the submitted and approved

schedule, the Contractor shall submit a revised schedule if requested by the Engineer within seven days after the date of the Engineer's request. This revised schedule shall show how the Contractor proposes to prosecute the balance of the Work, so as to complete the Work within the time specified in the Contract.

- 1.4 **Supervision of Work.** The Contractor shall be solely responsible for supervision of the Work, shall give the Work the constant attention necessary to ensure the expeditious and orderly progress thereof, and shall cooperate with the City in every possible way.

At all times, the Contractor shall have as its agent on the Work a competent superintendent capable of reading and thoroughly understanding the Specifications, with full authority to execute the directions of the City, without delay, and to supply promptly such labor, services, materials, equipment, plant, apparatus, appliances, tools, supplies and other items as may be required. Such superintendent shall not be removed from the Work without the prior written consent of the City. If, in the opinion of the City, the superintendent or any successor proves incompetent, the Contractor shall replace him/her with another person approved by the City; such approval, however, shall, in no way, relieve or diminish the Contractor's responsibility for the supervision of the Work.

Whenever the Contractor or its agent or superintendent is not present on any part of the Work where it may be necessary to give directions or instructions with respect to such Work, such directions or instructions may be given by the City to, and shall be received and obeyed by the foreman or any other person in charge of the particular work involved.

- 1.5 **Patents.** The Contractor shall indemnify and save harmless the City and all persons acting for or on behalf of the City from all claims and liability of any nature or kind, and all damages, costs and expenses, including attorneys' fees, arising from or occasioned by any infringement or alleged infringement of any patents or patent rights on any invention, process, material, equipment, article or apparatus, or any part thereof, furnished and installed by the Contractor, or arising from or occasioned by the use or manufacture thereof, including their use by the City.

- 1.6 **Electrical Energy.** The Contractor shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections and meters.

The Contractor shall provide sufficient lighting so that all work may be done in a workman like manner when there is not sufficient daylight.

- 1.7 **Compliance with Laws.** The Contractor shall keep itself fully informed of all existing and future federal, state and local laws, ordinances, rules, and regulations affecting those engaged or employed on the Work, the material and equipment used in the Work or the conduct of the Work, and of all orders, decrees and other requirements of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Specifications or other Contract Documents in relation to any such law, ordinance, rule, regulation, order, decree, or other requirement, the Contractor shall forthwith report the same to the City in writing. The Contractor shall, at

all times, observe and comply with, and cause all its agents, servants, employees and subcontractors to observe and comply with all such existing and future laws, ordinances, rules, regulations, orders, decrees and other requirements, and it shall protect, indemnify and save harmless the City, its officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, penalties, losses, damages, costs and expenses, including attorneys' fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule, regulation, order, decree or other requirement, whether committed by the Contractor or any of its agents, servants, employees or subcontractors.

- 1.8 **Provisions Required by Law Deemed Inserted.** Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the Contract shall forthwith be physically amended to make such insertion.
- 1.9 **Permits.** The Contractor shall, at its own expense, take out and maintain all necessary permits from the county, municipal, or other public authorities; shall give all notices required by law; and shall post all bonds and pay all fees and charges incident to the due and lawful prosecution of the Work.
- 1.10 **Not to Sublet or Assign.** The Contractor shall constantly give its personal attention to the faithful prosecution of the Work, shall keep the same under its personal control, shall not assign the Contract or sublet the Work or any part thereof without the previous written consent of the City, and shall not assign any of the monies payable under the Contract, or its claim thereto, unless by and with the like written consent of the City and the surety on the contract bonds. Any assignment or subletting in violation hereof shall be void and unenforceable.
- 1.11 **Delay by City.** The City may delay the beginning of the Work or any part thereof if the necessary lands or rights of way for such work shall not have been obtained. The Contractor shall have no claim for additional compensation or damages on account of such delay, but shall be entitled only to an extension of time as hereinafter provided.
- 1.12 **Time for Completion.** The rate of progress shall be such that the Work shall be performed and completed in accordance with the Contract before the expiration of the time limit stipulated under INFORMATION FOR BIDDERS, except as otherwise expressly provided herein.

It is agreed that the rate of progress herein required has been purposely made low enough to allow for the ordinary and foreseeable delays incident to work of this character. No extension of time will be given for ordinary or foreseeable delays, inclement weather, or accidents, and the occurrence of such will not relieve the Contractor from the necessity of maintaining this rate of progress and completing the Work within the stipulated time limit.

If delays are caused by acts of God, acts of Government, unavoidable strikes, extra work, or other causes or contingencies clearly beyond the control or responsibility of the

Contractor, the Contractor may be entitled to additional time to perform and complete the Work, provided that the Contractor shall, within ten (10) days from the beginning of such delay notify the City, in writing, of the cause and particulars of the delay. Upon receipt of such notification, the City shall review and evaluate the cause and extent of the delay. If, under the terms of the AGREEMENT, the delay is properly excusable, the City will, in writing, appropriately extend the time for completion of the Work. The Contractor agrees that it shall not have or assert any claim for nor shall it be entitled to any additional compensation or damages on account of such delays.

- 1.13 **Liquidated Damages.** In case the Contractor fails to complete the Work satisfactorily on or before the date of completion fixed herein or as duly extended as hereinbefore provided, the Contractor agrees that the City shall deduct from the payments due the Contractor each month, the sum of five hundred (\$500) dollars for each calendar day of delay. If the payments due the Contractor are less than the amount of such liquidated damages, said damages shall be deducted from any such monies due or to become due the Contractor, and, in case such damages shall exceed the amount of all monies due or to become due the Contractor, the Contractor or its surety shall pay the balance to the Owner.
- 1.14 **Employ Sufficient Labor and Equipment.** If, in the sole judgment of the City, the Contractor is not employing sufficient labor, plant, equipment or other means to complete the Work within the time specified, the City may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the City deems necessary to enable the Work to progress properly.
- 1.15 **Handling and Distribution.** The Contractor shall handle, haul, and distribute all materials on the different portions of the Work, as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished by it, until the final completion and acceptance of the Work.
- 1.16 **Occupying Private Land.** The Contractor shall not (except after written consent from the proper parties) enter or occupy with men, tools, materials, or equipment, any land outside the rights-of-way or property of the Owner. A copy of the written consent shall be given to the Engineer.
- 1.17 **Interference With and Protection of Streets.** The Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits from the proper authorities. If any street, road or private way shall be rendered unsafe by the Contractor's operations, it shall make such repairs or provide such temporary ways or guards as shall be acceptable to the City.

Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the Contractor, who shall assume and have full responsibility for the adequacy and safety of provisions made therefore.

The Contractor shall, at least 24 hours in advance, notify the Police and Fire Departments, in writing, with a copy to the Department of Public Works, if the closure of a street or road is necessary. The Contractor shall cooperate with the Police Department

in the establishment of alternate routes and shall provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.

- 1.18 **Safety.** The Contractor shall take all necessary precautions and provide all necessary safeguards to prevent personal injury and property damage. The Contractor shall provide protection for all persons including but not limited to its employees and employees of other contractors or subcontractors; members of the public; and employees, agents, and representatives of the City, and regulatory agencies that may be on or about the Work. The Contractor shall provide protection for all public and private property including but not limited to structures, pipes and utilities, above and below ground.

The Contractor shall provide and maintain all necessary safety equipment such as fences, barriers, signs, lights, walkways, guards and fire prevention and fire fighting equipment and shall take such other action as is required to fulfill its obligations under this subsection.

The Contractor shall comply with all applicable federal, state and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property.

The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This responsible person shall have the authority to take immediate action to correct unsafe or hazardous conditions and to enforce safety precautions and programs.

- 1.19 **Sanitary Regulations.** The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required or approved.

The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. The Contractor shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

The City shall have the right to inspect such facilities at all times to determine whether or not they are being properly and adequately maintained.

- 1.20 **Intoxicating Liquors.** The Contractor shall not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors upon or about the Work.

- 1.21 **Access to Work.** The City and its officers, agents, servants and employees may at all times and for any and all purposes, enter upon the Work and the site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities therefore.

- 1.22 **Examination of the Work.** The City shall be furnished by the Contractor with every reasonable facility for examining and inspecting the Work and for ascertaining that the

Work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down portions of finished work by the Contractor.

Should the work thus uncovered or taken down prove satisfactory, the cost of uncovering or taking down and the replacement thereof shall be considered as extra work unless the original work was done in violation of the Contract in point in time or in the absence of the Engineer or his/her inspector and without his/her written authorization, in which case said cost shall be borne by the Contractor. Should the work uncovered or taken down prove unsatisfactory, said cost shall likewise be borne by the Contractor.

Examination or inspection of the Work shall not relieve the Contractor of any of its obligations to perform and complete the Work as required by the Contract.

- 1.23 **Defective Work, Etc.** Until acceptance and during the applicable guarantee period thereafter, the Contractor shall promptly, without charge, repair, correct or replace work, equipment, materials, apparatus or parts thereof which are defective, damaged or unsuitable or which in any way fail to comply with or be in strict accordance with the provisions and requirements of the Contract or applicable guarantee and shall pay to the City all resulting costs, expenses, losses or damages suffered by the City.

If any material, equipment, apparatus or other items brought upon the site for use or incorporation in the Work, or selected for the same, is rejected by the City as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall forthwith remove such materials, equipment, apparatus and other items from the site of the Work and shall at its own cost and expense make good and replace the same.

- 1.24 **Precautions During Adverse Weather.** During adverse weather and against the possibility thereof, the Contractor shall take all necessary precautions so that the Work may be properly done, and satisfactory in all respects.

- 1.25 **Right to Materials.** Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials, equipment, apparatus and other items furnished after they have been installed or incorporated in or attached or affixed to the Work or the site, but all such materials, equipment, apparatus and other items shall, upon being so installed, incorporated, attached or affixed, become the property of the City. Nothing in this subsection shall relieve the Contractor of its duty to protect and maintain all such materials, equipment, apparatus and other items.

- 1.26 **Changes.** The City may make changes in the Work and in the Specifications therefore by making alterations therein, additions thereto or omissions therefrom. All work resulting from such changes shall be performed and furnished under and pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefore at the unit prices stipulated in the Contract for such work.

Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the City authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

The Contractor agrees that it shall neither have or assert any claim for or be entitled to any additional compensation for damages or for loss of anticipated profits on work that is eliminated.

- 1.27 **Extra Work.** The Contractor shall perform any extra work (work in connection with the Contract but not provided for herein) when and as ordered in writing by the City, at the unit prices stipulated in the Contract for such work or, if none are so stipulated, either (a) at the price agreed upon before such work is commenced and named in the written order for such work, or (b) if the City so elects, for the actual cost of such work, as determined by the Contractor and approved by the City, plus a percentage of such cost, as set forth below. No extra work shall be paid for unless specifically ordered as such in writing by the City.

The cost of extra work done under (b) above shall include the actual cost to the Contractor of materials used and equipment installed, common and skilled labor, and foremen, and the fair rental of all machinery and equipment used on the extra work for the period of such use.

At the request of the City, the Contractor shall furnish itemized statement of the cost of the extra work ordered as above and give the City access to all records, accounts, bills and vouchers and correspondence relating thereto.

The Contractor may include in the cost of extra work the amounts of additional premiums, if any, (other than premiums on bonds) paid on the required insurance on account of such extra work, of Social Security or other direct assessments upon the Contractor's payroll by federal or other properly authorized public agencies, and of other approved assessments when such assessments are not normally included in payments made by the Contractor directly to its employees, but in fact, are, and are customarily recognized as, part of the cost of doing work.

The fair rental of all machinery and equipment shall be based upon the most recent edition of "Compilation of Rental Rates for Construction Equipment", published by the Associated Equipment Distributors, or a similar publication approved by the City. Rental for machinery or equipment shall be based upon an appropriate fraction of the approved monthly rate schedule. If said extra work requires the use of machinery or equipment not already on the site of the Work, the cost of transportation, not exceeding a distance of 100 miles, of such machinery or equipment to and from the Work shall be added to the fair monthly rate; provided however, that this shall not apply to machinery or equipment already required to be furnished under the terms of the Contract.

The Contractor shall not include in the cost of extra work any cost or rental of small tools, building, or any portion of the time of the Contractor, its superintendent, or its office and engineering staff.

To the cost of extra work done by the Contractor's own forces under (b) above (determined as stated above), the Contractor shall add 15 percent to cover its overhead, use of capital, the premium on the bonds as assessed upon the amount of this extra work, and profit.

In the case of extra work done under (b) above by a subcontractor, the subcontractor shall compute, as above, its cost for the extra work, to which it shall add 15 percent as in the case of the Contractor, and the Contractor shall be allowed an additional 15 percent of the subcontractor's cost for the extra work to cover the costs of the Contractor's overhead, use of capital, the premium on the bonds as assessed upon the amount of this extra work, and profit. Said subcontractor's cost must be reasonable and approved by the City.

If extra work is done under (b) above, the Contractor and/or subcontractor shall keep daily records of such extra work. The daily record shall include the names of persons employed, the nature of the work performed, and hours worked, materials and equipment incorporated, and machinery or equipment used, if any, in the prosecution of such extra work. This daily record, to constitute verification that the work was done, must be signed both by the Contractor's authorized representative and by the City. A separate daily record shall be submitted for each extra work order.

- 1.28 **Extension of Time on Account of Extra Work.** When extra work is ordered near the completion of the Contract or at any time during the progress of the Work which unavoidably increases the time for the completion of the Work, an extension of time shall be granted as hereinbefore provided.
- 1.29 **Changes Not to Affect Bonds.** It is distinctly agreed and understood that any changes made in the Work or the drawings or specifications therefore (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in the manner or time of payments made by the City to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the surety on the contract bonds given by the Contractor, it being the intent hereof that notwithstanding such changes the liability of the surety on said bonds continue and remain in full force and effect.
- 1.30 **Claims for Damages.** If the Contractor makes claim to any damages alleged to have been sustained by breach of contract or otherwise, it shall, within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained, whichever date is earlier, file with the City a written, itemized statement in triplicate of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such statement is made and filed as so required, its claim for damages shall be deemed waived, invalid and unenforceable, and that it shall not be entitled to any compensation for any such alleged damages.
- 1.31 **Abandonment of Work or Other Default.** If the Work shall be abandoned, or any part thereof shall be sublet without previous written consent of the City, or the Contract or any monies payable hereunder shall be assigned otherwise than as herein specified, that the conditions herein specified as to rate of progress are not being complied with, or that the Work or any part thereof is being unnecessarily or unreasonably delayed, or that the Contractor has violated or is in default under any of the provisions of the Contract, or if

the Contractor becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an arrangement or reorganization under the Bankruptcy Act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitute a default under the Contract, the City may notify the Contractor in writing, with a copy of such notice mailed to the surety, to discontinue all work or any part thereof; thereupon the Contractor shall discontinue such work or such part thereof as the City may designate; and the City may, upon giving such notice by contract or otherwise as it may determine, complete the Work or such part thereof and charge the entire cost and expense of so completing the Work or such part thereof to the Contractor. In addition to the said entire cost and expense of completing the work, the City shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay to the City any losses, damages, costs and expenses, including attorney's fees, sustained or incurred by the City by reason of any of the foregoing causes. For the purposes of such completion, the City may, for itself, or for any contractors employed by the City, take possession of and use or cause to be used any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the Work.

All costs, expenses, losses, damages, attorney's fees and any and all other charges incurred by the City under this subsection shall be charged against the Contractor and deducted and/or paid by the City out of the monies due or payable or to become due or payable under the Contract to the Contractor; in computing the amounts chargeable to the Contractor, the City shall not be held to a basis of the lowest prices for which the completion of the Work or any part thereof might have been accomplished, but all sums actually paid or obligated therefore to effect its prompt completion shall be charged to and against the account of the Contractor. In case the costs, expenses, losses, damages, attorney's fees and other charges together with all payments therefore made to or for the account of the Contractor if the Work had been properly performed and completed by the Contractor, the Contractor shall be entitled to receive the difference, and, in case such costs, expenses, losses, damages, attorney's fees and other charges, together with all payments therefore made to or for the account of the Contractor, shall exceed the said sum, the Contractor shall pay the amount of the excess to the City.

- 1.32 **Prices for Work.** The City shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.
- 1.33 **Formal Acceptance.** Fixing of the date of completion and acceptance of the Work or a specified part thereof shall only be effective when accomplished by a writing specifically so stating and signed by the City.
- 1.34 **Progress Estimates.** Once a month, except as hereinafter provided, the City shall make an estimate in writing of the total amount and value of the work done to the first of the month by the Contractor. The City shall retain 5 percent of such estimated value, as part security for fulfillment of the Contract by the Contractor and shall deduct from the balance of all previous payments made to the Contractor, all sums chargeable against the Contractor and all sums to be retained under the provisions of the Contract. The City

shall pay monthly to the Contractor the balance not deducted and/or retained as aforesaid, except that payment may be withheld at any time, if in the judgment of the City, the work is not proceeding in accordance with the Contract. If the City deems it expedient to do so, it may cause estimates and payments to be made more frequently than once in each month. No progress estimate or payment need be made when in the judgment of the City, the total value of the Work done since the last estimate amounts to less than \$5,000.

Estimates of lump-sum items shall be based on a schedule dividing each such item into its appropriate component part, together with a quantity and a unit price for each part so that the sum of the products of prices and quantities will equal the contract price for the item. This schedule shall be submitted by Contractor for and must have the approval of the City before the first estimate becomes due.

If the City determines that the progress of the Work will be benefited by the delivery to the site of certain materials and equipment, when available, in advance of actual requirement therefore and if such materials and equipment are delivered and properly stored and protected, the cost to the Contractor or subcontractor as established by invoices or other suitable vouchers satisfactory to the City, less the retained percentages as above provided, may be included in the progress estimates; provided always that there be duly executed and delivered by the Contractor to the City at the same time a Bill of Sale in form satisfactory to the City, transferring and assigning to the City full ownership and title to such materials or equipment.

- 1.35 **Partial Acceptance.** The City may at any time, in a written order to the Contractor (1) declare that it intends to use a specified part of the Work which, in its opinion, is sufficiently complete, in accordance with the Contract Documents, to permit its use; (2) enclose a tentative list of items remaining to be completed or corrected, and (3) fix the date of acceptance of that specified part of the Work.

Within 45 days after acceptance under this subsection, the City shall make an estimate, in writing, of the amount and value of the part of the Work, so accepted and shall pay said amount to the Contractor after deducting therefrom all previous payments, all charges against the Contractor as provided for hereunder, and all amounts to be retained under the provisions of the Contract, said payment to be made at the time of the next monthly progress estimate.

Acceptance by the City under this sub-section shall not relieve the Contractor of any obligations under the Contract Documents except to the extent agreed upon in writing between the City and the Contractor.

The City shall have the right to exclude the Contractor from any part of the Work which has been accepted, but the City will allow the Contractor reasonable access thereto to complete or correct items on the tentative list.

- 1.36 **Final Estimate and Payment.** As soon as practicable (but not more than sixty-five (65) days) after final completion of the Work, the City shall make a final estimate, in writing, of the quantity of work done under the Contract and the amount earned by the Contractor.

The City shall pay to the Contractor the entire amount found to be earned and due hereunder after deducting therefrom all previous payments, all charges against the Contractor as provided for hereunder, and all amounts to be retained under the provisions of the Contract. Except as in this sub-section otherwise provided such payment shall be made not later than fifteen (15) days after, but in no event before, the expiration of the time within which claims for labor performed or materials or equipment furnished must be filed under the applicable Lien Law, or, if such time is not specified by law, the expiration of thirty (30) days after the completion of the Engineer's final estimate. All quantities shown on progress estimates and all prior payments shall be subject to correction in the final estimate and payment.

- 1.37 **Liens.** If, at any time, any notices of lien are filed for labor performed or materials or equipment manufactured, furnished, or delivered to or for the Work, the Contractor shall, at its own cost and expense, promptly discharge, remove or otherwise dispose of the same, and until such discharge, removal or disposition, the City shall have the right to retain from any monies payable hereunder an amount which, in its sole judgment, it deems necessary to satisfy such liens and pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce the same, or incurred in connection therewith or by reason thereof.
- 1.38 **Claims.** If, at any time, there be any evidence of any claims for which the Contractor is or may be liable or responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the City may retain from any monies which would otherwise be payable hereunder so much thereof as, in its sole judgment, it may deem necessary to settle or otherwise dispose of such claims and to pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce such claims, or incurred in connection therewith or by reason thereof.
- 1.39 **No Waiver.** Neither the inspection by the City, nor any order, measurement, approval, determination, decision of certificate by the City for the payment of money; nor any payment for or use, occupancy, possession or acceptance of the whole or any part of the work by the City, nor any extension of time, nor any other act or omission of the City shall constitute or be deemed to be an acceptance of any defective or improper work, materials, or equipment nor operate as a waiver of any requirement or provision of the Contract, nor of any remedy, power or right of or herein reserved to the City, nor of any right to damages for breach of contract. Any and all rights and/or remedies provided for in the Contract are intended and shall be construed to be cumulative; and, in addition to each and every other right and remedy provided for herein or by law, the City shall be entitled as of right to a writ of injunction against any breach or threatened breach of the Contract by the Contractor, by its sub-contractors or by any other person or persons.
- 1.40 **Liability of City.** No person, firm or corporation, other than the Contractor, who signed the Contract as such, shall have any interest herein or right hereunder. No claim shall be made or be valid either against the City or any agent of the City and neither the City nor any agent of the City shall be liable for or be held to pay any money, except as herein provided. The acceptance by the Contractor of the payment as fixed in the final estimate shall operate as and shall be a full and complete release of the City and of every agent of the City of and from any and all claims, demands, damages and liabilities of, by or to the

Contractor for anything done or furnished for or arising out of or relating to or by reason of the Work or for or on account of any act or neglect of the City or of any agent of the City or of any other person, arising out of, relating to or by reason of the Work, except the claim against the City for the unpaid balance, if any there be, of the amounts retained as herein provided.

- 1.41 **Guarantee.** The Contractor guarantees that the Work and services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the drawings, specifications, and other contract documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled.
- 1.42 **Cleaning Up.** The Contractor, at all times, shall keep the site of the Work free from rubbish and debris caused by its operations under the Contract. When the Work has been completed, the Contractor shall remove from the site of the Work all of its plant, machinery, tools, construction equipment, temporary work and surplus materials so as to leave the Work and the site clean and ready for use.
- 1.43 **Legal Address of Contractor.** The Contractor's business address and its office at or near the site of the Work are both hereby designated as places to which communications in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the Post Office Department or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon the Contractor, and the date of such service shall be the date of receipt. The first named address may be changed at any time by an instrument, in writing, executed and acknowledged by the Contractor and delivered to the City. Service of any notice, letter or other communication upon the Contractor personally shall likewise be deemed sufficient service.
- 1.44 **Modification of Termination.** Except as otherwise expressly provided herein, the Contract may not be modified except in writing signed by the parties hereto.

MEASUREMENT AND PAYMENT

MEASUREMENT AND PAYMENT

General: The following subsections describe the measurement of and payment for the work to be done under items listed in the Bid.

Each unit or lump sum price stated in the Bid shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications, including cleaning up.

The price for those items that involve excavation shall include compensation for disposal of surplus excavated materials, handling water, and installation of all necessary sheeting and bracing.

The prices for all conduit items (sewers, drains, and water mains) shall constitute full compensation for furnishing, laying, jointing, and testing pipe, earth excavation, backfill, compaction and bedding materials.

In all items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price, therefore, shall be in addition to the cost of excavating earth and no deduction will be made in the amount for earth excavation.

Item 1 Mobilization/De-mobilization. The total price bid for Mobilization and Demobilization shall not exceed five (5) percent of the total amount of the remaining bid items. The lump sum price for Item 1 shall constitute full compensation for preparing the site including (but not limited to): sawcutting of sidewalks, roadways, and driveways; removal and stockpiling of loam; removal and disposal of trees, brush, and stumps as required; disposal of surplus loam material as directed; protecting property pins, bounds and other documentation, fences, walls, and walks; and removing and resetting signs as required. The price shall also include protection of excavations left open, all safety and construction signage, obtaining all permits, cleanup and all other related work necessary, indicated by the plans, or as specified or directed.

Item 2 Silt Sack/ Catch Basin Protection. The unit price for Item 2 shall constitute full compensation for installation and later removal and disposal of silt sacks/catch basin protection as shown on the plans and areas designated by the Engineer.

Under Item 2, the quantity of silt sacks/catch basin protection installed shall be the total number of items installed. The price shall include all materials, equipment, and labor required for a completed installation and later removal.

Item 3 Earth Excavation (Unsuitable Materials). The unit price for Item 3 shall constitute full compensation for general excavation and disposal of surplus and unsuitable materials.

Under Item 3, the quantity of earth excavation to be paid for shall be the number of cubic yard of excavation not otherwise classified or paid for under other items. Slope re-grading is included under this item.

Item 4 Rock Removal (Ledge). The unit price for Item 4 shall constitute full compensation for all excavation, replacement backfill, compaction, removal and proper off-site disposal of

material, and all labor, equipment and materials required for or incidental to the Work as directed and as specified.

Under Item 4, the quantity of rock removal shall be measured in cubic yards as measured in the field by the Engineer or authorized representative regardless of the depth at which it is encountered. Width Measurement limits for payment purposes shall be as shown on the “Trench Paylines” Detail on the Drawings. Boulders less than 1 cubic yard will be paid for under other items.

Item 5 Gravel Borrow. The unit price for Item 5 shall constitute full compensation for the furnishing, placing, and compaction of gravel borrow as directed and as specified, including all labor and equipment.

Under Item 5, the quantity of gravel borrow shall be measured in cubic yards, placed and compacted. The amount of gravel borrow paid for will be equal to the actual amount of gravel borrow placed and compacted. Width Measurement limits for payment purposes shall be as shown on the “Trench Paylines” Detail on the Drawings.

Item 6 12” DICL Class 52 Water Pipe & Fittings w/Bronze Wedges. The length of water pipe to be paid for under Item 6 shall be measured by the linear foot along a horizontal projection of the centerline of the completed water pipe.

No deductions or additions will be made for the lengths of valves, specials, and appurtenances furnished and laid under other items.

The unit price for Item 6, shall constitute full compensation for construction of water pipes, complete, as indicated on the plans, and as specified, including excavation, shoring, pavement removed and disposal, backfill, thrust blocks, corporations for air bleeders and chlorination, clearing, disinfection, testing, and all labor, equipment and materials required for or incidental to the construction of the water pipes.

Item 7 12” DICL Class 52 Water Pipe w/Insulation & Jacket & Bronze Wedges. The length of water pipe with insulation and jacket to be paid for under Item 7 shall be measured by the linear foot along a horizontal projection of the centerline of the completed water pipe.

No deductions or additions will be made for the lengths of valves, specials, and appurtenances furnished and laid under other items.

The unit price for Item 7, shall constitute full compensation for construction of water pipe with insulation and jacket, complete, as indicated on the plans, and as specified, including clearing, disinfection, testing, and all labor, equipment and materials required for or incidental to the construction of the water pipe.

Items 8 & 9 Compact Ductile Iron Fittings. The unit price for Items 8 and 9 shall constitute full compensation for furnishing and installing compact ductile iron fittings, including bends and tees and other appurtenances necessary for the construction of the water main, as specified, and as shown on the plans. Compensation shall also include excavation, permanent connection, backfill, and compaction after the new main has been tested and approved.

Under Items 8 and 9, measurement for ductile iron fittings shall be a count of the number of ductile iron fittings installed as specified and as shown on the plans. Megalug retainers are required on all bends and tees.

Item 10 LB&A Double Roller Assembly S.S. The unit price for Item 10 shall constitute full compensation for each LB&A Double Roller Assembly S.S. furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 11 2" Pipe Saddle. The unit price for Item 11 shall constitute full compensation for each 2" pipe saddle furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 12 20" x 9" x 3/4" A36 Plate Galvanized. The unit price for Item 12 shall constitute full compensation for each 20" x 9" x 3/4" A36 Plate Galvanized furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 13 10 1/2" x 10 1/2" x 1/2" A36 Plate Galvanized. The unit price for Item 13 shall constitute full compensation for each 10 1/2" x 10 1/2" x 1/2" A36 Plate Galvanized furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 14 A325 3/4" Bolt, Nut, Washers Galvanized. The unit price for Item 14 shall constitute full compensation for each A325 3/4" Bolt, Nut, Washers Galvanized furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 15 4000 PSI, 11/2", 565 Cement Concrete. The unit price for Item 15 shall constitute full compensation for furnishing and placing 4000 PSI, 11/2", 565 Cement Concrete as shown on the plans and as directed and specified, including all labor and equipment.

Under Item 15, the quantity of 4000 PSI, 11/2", 565 Cement Concrete shall be measured in cubic yards. The amount paid for will be equal to the actual amount furnished and placed.

Item 16 A615 GR 60 Steel Reinforcing. The unit price for Item 16 shall constitute full compensation for furnishing and installing A615 GR 60 Steel Reinforcement as shown on the plans and as directed and specified, including all labor and equipment.

Under Item 15, the quantity of A615 GR 60 Steel Reinforcing shall be measured in pounds to the nearest half pound. The amount paid for will be equal to the actual amount furnished and installed.

Item 17 16" Diameter Galvanized Pipe Sleeve. The length of 16" diameter galvanized pipe sleeve to be paid for under Item 17 shall be measured by the linear foot in a straight line from the centerline of the pipe.

The unit price for Item 17 shall constitute full compensation for each linear foot of 16" diameter galvanized pipe sleeve, furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 18 Casing Spacer. The unit price for Item 18 shall constitute full compensation for each casing spacer furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 19 Link Seal. The unit price for Item 19 shall constitute full compensation for each link seal furnished, in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Item 20 SPC-B-12.5 Superpave. The unit price for Item 20 shall constitute full compensation including the processed gravel and furnishing, hauling, placing, spreading, and compacting the gravel road base and bituminous concrete, and all labor, materials, and equipment required as shown on the plans and as specified.

Under Item 20, the quantity of SPC-B-12.5 Superpave shall be measured in tons to the nearest one tenth of a ton. The amount paid for will be the actual tons placed and compacted.

Item 21 1" Closed Cell Foam. The unit price for Item 21 shall constitute full compensation for furnishing and installing 1" closed cell foam in place, complete as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the installation.

Under Item 21, the quantity of 1" closed cell foam shall be measured in square feet. The amount paid for will be the actual square feet furnished and installed.

Item 22 Bituminous Damp Proofing. The unit price for Item 22 shall constitute full compensation for applying bituminous damp proofing as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the work.

Under Item 22, the quantity of bituminous damp proofing shall be measured in square yards. The amount paid for will be the actual square yards applied.

Item 23 Reinforced Concrete Excavation. The unit price for Item 23 shall constitute full compensation for excavation of reinforced concrete and disposal of materials as indicated on the plans, and as specified, including all labor, equipment, and materials required for or incidental to the work.

Under Item 23, the quantity of reinforced concrete excavation to be paid for shall be the actual number of cubic yards excavated and disposed.

Item 24 Permanent Trench Patch in Roadway. The unit price for Item 24 shall constitute full compensation including the processed gravel and furnishing, hauling, placing, spreading, and compacting the gravel road base and bituminous concrete, and all labor, materials, and equipment required as shown on the plans and as specified.

Under Item 24, the quantity of permanent trench patch shall be measured in square yards. The amount paid for will be the actual square yards placed. The width will be the actual width of repair made, but in no case will payment be made for a trench repair greater in width than that shown on the "Trench Paylines" Detail on the Drawings.

TECHNICAL SPECIFICATIONS

SPECIAL PROVISIONS
GREENFIELD

Installation of 12 inch water pipe on Nash's Mill Road Bridge over Green River

SCOPE OF WORK

All work under this contract shall be done in conformance with the Commonwealth of Massachusetts Department of Transportation *Standard Specifications for Highways and Bridges* dated 2023, as amended, and the the City of Greenfield Standards.

The project consists of installation of approximately 150 feet of 12 inch water main attached to the Nash's Mill Bridge over the Green River in Greenfield, Massachusetts.

REINFORCED CONCRETE EXCAVATION **CUBIC YARD**

The work consists of removal of portions of reinforced concrete approach slabs and bridge structure. The installation of the water main will require demolition to the limits shown on the plans.

Any temporary earth support, trench box, earth excavation, and gravel borrow for backfilling required to perform the demolition shall be included in other items.

EQUIPMENT

Surface preparation and concrete removal equipment will be of the following types:

- (1) Pneumatic and Power Driven Chipping Hammers in excess of twenty five pound class may be used for the removal of concrete where sound or unsound concrete may be encountered in the areas of known demolition. The Contractor will take care not to damage the reinforcing steel that will be re-used in the proposed construction. The Engineer may reject methods or equipment that may render the reinforcing steel unsuitable for re-use.
- (2) Core drilling may be used to penetrate the abutment wall.
- (3) Grit Blasting Equipment: Grit blasting equipment will be capable of removing rust and old concrete from exposed reinforcing steel when deemed necessary.

The Engineer may reject the use of any methods or equipment that causes undue vibration or possible damage to any part of the structure to remain.

CONSTRUCTION METHODS

Drawings of the existing bridge are available from the Massachusetts DOT.

The Contractor shall make adequate provisions, including the erection of a temporary protective shielding for protection of the waterway, roadway, and personnel from damage or injury due to

demolition operations and debris removal. All such provisions or shielding will be incidental to this item.

The edges of all areas where concrete is removed under this item will be saw cut to a depth of 1 inch prior to excavation and all costs in connection with such work will be incidental to this item. Alternatively, the approach slabs may be cut full depth. If full depth cutting is used, the edges shall be roughened to an amplitude of 1/4 inch and new reinforcing matching the proposed reinforcing shall be drilled and grouted to build the new edge. Roughening and drilling and grouting will be incidental to this item. Edges of concrete core drilled need not be saw cut.

The Contractor will clean all existing reinforcement bars being used in the new construction and concrete surfaces contacting new concrete by grit blasting prior to placing new concrete. No grease, dust, rust, or laitance will be allowed to remain.

The Contractor will take all precautions necessary so as not to damage any portion of structure to remain. Any existing reinforcing steel damaged as a result of the Contractor's operations will be repaired to the satisfaction of the Engineer and at no additional cost to the City.

All reinforcing steel that is loose will be tied tightly together using wire ties.

MEASUREMENT AND PAYMENT

The work under this Item will be paid for at the Contract Unit Price Bid, Cubic Yard, under Item Reinforced Concrete Excavation, which price will constitute full compensation for all labor, materials and equipment required for the satisfactory completion of the work described above as shown on the plans and/or as directed by the Engineer.

12 INCH DUCTILE IRON WATER PIPE **(MECHANICAL JOINT)**

FT

The work under this item shall conform to the relevant provisions of MasDOT Standard Specifications of Section 303.24 and the following:

For pipe hung beneath the Bridge, provide ductile iron restrained push-on joint pipe. Pipe in this section shall be capable of providing a maximum of 2.25 degrees deflection and linear pullout of 0.05 feet per joint. Joints restraints shall be accomplished by the use of a retainer weldment ring on the spigot end of the pipe along with eight locking segments that fit within a mating slot in the bell end of the adjoining pipe. Pipe hung beneath the bridge shall be insulated and jacketed. Refer also to 12 Inch Water Pipe Support.

Insulation will be 2" thick urethane conforming to MassDOT Standard Specification M.9.11.4.

Waterproof Jacket will be 0.02" thick corrugated aluminum secured with stainless steel straps conforming to MassDOT Standard Specification M.9.11.5.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

12 Inch Ductile Iron Water Pipe (Mechanical Joint) will be paid for at the Contract unit price per foot, which price shall include pipe, restraints, insulation, jacket, all labor, materials, equipment and incidental costs required to complete the work.

12 INCH WATER PIPE SUPPORT

EACH

Provide pipe support assembly under this item where shown on the drawings. Pipe support assembly to include threaded hanger rods and nuts, adjustable double roller pipe support, saddle, and FRP casing shield.

All hardware and threaded rods shall be stainless steel 304 and of appropriate thickness to support the weight of the pipe, insulation, and water. The roller support shall be LB&A, Eaton, Cooper Industries, National Pipe Hanger, or approved equal. The pipe saddle shall be series B-Line by Eaton, Cooper Industries, Rilco, or approved equal. The FRP shield shall be constructed of ultraviolet and salt tolerant fiberglass reinforced vinylester resin, electrically nonconductive, and capable of installation using a snap action, with optional support using banding or tape to hold in place on pipe. Sub-zero temperatures shall not affect material properties.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Pipe supports will be paid for at the Contract unit price per each assembly, which shall include all labor, materials, equipment, and incidental costs required to complete the work.

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TECHNICAL SPECIFICATIONS

CONSTRUCTION FACILITIES

Summary. Section includes:

- a. Temporary utilities required by the Contractor
- b. Temporary sanitary facilities
- c. First aid station

Quality Assurance. Maintain temporary construction facilities in proper and safe condition throughout the progress of the Work.

Temporary Utilities. Temporary utilities services (Water, Electricity, Telephone, etc) shall be arranged by the Contractor if any of these are required by the Contractor.

Temporary Sanitary and First Aid Facilities. Provide suitably enclosed chemical or self-contained toilets for the use of the labor force employed on the Work. Toilets shall be located near the Work sites and secluded from observation insofar as possible. Toilets shall be serviced weekly, kept clean and supplied throughout the course of the Work.

Contractor shall enforce proper use of sanitary facilities.

Use of the Owner's sanitary facilities by the Contractor is prohibited.

Provide a first aid station at the site.

ITEM 1 SITE PREPARATION AND CLEANUP

- 1.1 General
- 1.2 Clearing
- 1.3 Grubbing
- 1.4 Disposal
- 1.5 Care of Loam
- 1.6 Work in Improved Property
- 1.7 Relocation of Trees, Shrubs, Hedges, and Fences
- 1.8 Work in Easements
- 1.9 Stone Walls and Fences
- 1.10 Fill
- 1.11 Clean-up
- 1.12 Construction Signs
- 1.13 Sawcutting

1.1 General. The Contractor shall furnish all labor, materials, tools and equipment necessary and shall do all work to prepare the site as indicated on the drawings and as herein specified.

Extreme care shall be taken by the Contractor and his employees not to damage trees, and the Contractor shall be responsible for all damage done.

1.2 Clearing. From areas to be cleared, the Contractor shall cut or otherwise remove all designated trees, saplings, brush, vines, and other vegetable matter such as snags, sawdust, bark, etc., and refuse.

1.3 Grubbing. The area to be grubbed shall be the same as that which is to be cleared. Grubbing shall consist of the complete removal of all tree stumps and all roots larger than 3 in. in diameter to a depth of 6 in. below the ground surface. Such depths shall be measured from the existing ground surface or the proposed finished grade, whichever is the lower.

1.4 Disposal. All material collected by the Contractor in the course of clearing and grubbing shall be hauled away for disposal off the site. Such disposal shall be carried on as promptly as possible after removal of material in the grubbing operations and shall not be left until the final period of cleaning up.

1.5 Care of Loam. Wherever work in easements is to be done, the Contractor shall first scrape all loam to one side so that it will not become mixed with the roadway or other excavation materials. After the construction work is completed, the loam shall be re-spread upon the land. No loam shall be taken away from the easements, and if the existing loam is of an insufficient amount, the Contractor at his own expense, shall furnish and spread loam to a minimum compacted thickness of 6 in.

1.6 Work in Improved Property. Trees, cultivated hedges, lawns, shrubs, and plants which might be damaged by the Contractor's operations shall be protected by suitable means or shall be dug up and temporarily replanted and cared for. After the construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If trees, cultivated hedges, lawns, shrubs and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced at the Contractor's expense by items of kind and quality at least equal to the kind and quality existing at the start of the Work.

In all work in improved property, the Contractor shall do such hand work as may be required to prevent damage to buildings or trees.

1.7 Relocation of Trees, Shrubs, Hedges, and Fences. Where trees, shrubs, hedges, and fences interfere with the Work, the trees, shrubs, and hedges will be replanted by the Contractor, as indicated on the plans, or directed by the Engineer. Said trees, shrubs, and hedges will be replanted on improved property. The Contractor shall be responsible for care of said plantings, and responsible for re-establishing growth. If the trees, shrubs, or hedges are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced at the Contractor's expense (see Item 1.6).

In the instance of fences conflicting with the construction work these fences shall be relocated to private property by the Contractor as indicated on the plans, or directed by the Engineer.

Any trees, shrubs, or hedges requiring trimming over Town land shall be done by the Contractor as indicated on the plans, or as directed by the Engineer.

1.8 Work in Easements. After the construction work is completed, all easements shall be loamed and seeded as specified under LOAMING AND SEEDING.

1.9 Stone Walls and Fences. Wherever stone walls or fences need to be removed to provide access to the Work or if stone walls or fences are damaged during the progress of the Work, they shall be restored or repaired to as good condition as existed prior to entry, or disposed of if directed by the Engineer.

1.10 Fill. The Contractor shall fill where needed, within the easement, to provide cover as indicated on the drawings.

1.11 Clean-up. During its progress the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

Where material or debris have washed or flowed into or been placed in existing water courses, ditches, gutters, drains, pipes, structures, work done under this contract or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall upon completion of the work, be left in a clean and neat condition.

On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted, in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

The Contractor shall restore or replace, when and as directed, any public or private property damage by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do as required all necessary highway or driveway walk and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The Contractor shall be responsible for replacing or resetting lost or damaged property pins and bounds, whether private or public, by a registered land surveyor.

1.12 Construction Signs. The Contractor shall supply, erect, and properly maintain all temporary advance warning construction signs in all areas to be affected by his operations. Signs shall be placed in locations shown on the plans or as specified and no work will begin until all such signs are in place and their locations approved by the Engineer.

All signs shall conform to the specifications set forth in the Manual on Uniform Traffic Control Devices, latest edition, or to specifications shown in the detail section of the plans.

1.13 Sawcutting. Any sawcutting required for the sidewalk, roadways and driveways shall be performed by the Contractor as indicated on the plans, or as directed by the Engineer.

ITEM 3

EARTH EXCAVATION, BACKFILL, FILL, AND GRADING

- 3.1 General
- 3.2 Description
- 3.3 Extent of Open Excavation
- 3.4 Separation of Surface Materials
- 3.5 Sheet piling and Bracing
- 3.6 Drainage
- 3.7 Trench Excavation
- 3.8 Depth of Trench
- 3.9 Width of Trench
- 3.10 Trench Excavation in Fill
- 3.11 Excavation Near Existing Structures
- 3.12 Protection of Existing Structures
- 3.13 Relocation and Replacement of Existing Structures
- 3.14 Care and Restoration of Property
- 3.15 Unauthorized Excavation
- 3.16 Elimination of Unsuitable Material
- 3.17 Disposal of Surplus Excavated Materials
- 3.18 Dust Control
- 3.19 Bridging Trenches
- 3.20 Backfilling - General
- 3.21 Fill and Backfill Under Structures
- 3.22 Backfilling Around Structures
- 3.23 Backfilling Pipe Trenches
- 3.24 Material for Filling and Embankments
- 3.25 Preparation of Subgrade
- 3.26 Placing and Compacting Embankment Material

3.1 General. The Contractor shall make excavation of normal depth in earth for trenches and structures; shall backfill such excavations to the extent necessary; shall furnish the necessary materials and construct embankments and fills and shall make miscellaneous earth excavations and do miscellaneous grading. All such work shall be done as indicated on the drawings and as herein specified.

The program of excavation, dewatering, sheet piling, and bracing shall be carried out in such manner as to eliminate all possibility of undermining or disturbing the foundations of existing structures or of work previously completed under this contract.

3.2 Description. The Contractor shall make excavations in such manner and to such widths as will give suitable room for building the structures or laying and jointing the piping; shall furnish and place all sheet piling, bracing, and supports; shall do all cofferdamming, pumping, and

draining; and shall render the bottom of the excavations firm and dry and acceptable in all respects.

In no case, except as provided for in the sections TRENCH EXCAVATION and PREPARATION OF SUBGRADE, shall the earth be plowed, scraped, or dug by machinery so near to the finished subgrade as to result in the disturbance of material below said subgrade, but the last of the material to be excavated shall be removed with pick and shovel just before the placing of the pipe, masonry, or other structure.

All excavation, except as otherwise specified or permitted, shall be made in the open.

3.3 Extent of Open Excavation. The length of trench open at any one time will be controlled by the conditions, subject to any limits that may be prescribed by the Engineer.

3.4 Separation of Surface Materials. The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the work. The pavement cut shall be made with an approved saw, without extra compensation to the Contractor. Where pavement is removed in large pieces, it shall be disposed of before proceeding with the excavation.

3.5 Sheeting and Bracing. The Contractor shall furnish, put in place, and maintain such sheeting, bracing, etc., as may be necessary to support the sides of the excavation and to prevent any movement of earth which could in any way diminish the width of the excavation to less than that necessary for proper construction, or could otherwise injure or delay the work, or endanger adjacent structures.

Whenever possible, sheeting shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along with the sheeting will be driven. Care shall be taken to prevent voids outside of the sheeting, but, if voids occur, they shall be filled immediately with sand and compacted.

The Contractor shall leave in place to be embedded in the backfill, or concrete, all sheeting, bracing, etc., which is indicated on the drawings to be so left in place. He also shall leave in place any and all other sheeting, bracing, etc., which the Engineer may direct him in writing to leave in place, at any time during the progress of the work, for the purpose of preventing injury to structures or property.

The Engineer may direct that sheeting and bracing be cut off at any specified elevation.

All sheeting and bracing not to be left in place shall be carefully removed in such manner as not to endanger the construction or other structures. All voids left or caused by the withdrawal of sheeting shall be backfilled immediately using approved materials and compaction methods.

3.6 Drainage.

- a. General. To ensure proper conditions at all time during construction, the Contractor shall provide and maintain ample means and device (including spare units kept ready for immediate use in case of breakdowns) with which to intercept and/or remove promptly and dispose properly of all water entering trenches and other excavation. Such excavations shall

be kept dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged.

All water pumped or drained from the work shall be disposed of in a suitable manner without undue interference with other work, damage to pavements, other surfaces, or property. Suitable temporary pipes, flumes, or channels shall be provided for water that may flow along or across the site of the work.

- b. Temporary Underdrains. Temporary underdrains, if used, shall be laid in trenches beneath the grade of the structure. Trenches shall be of suitable dimensions to provide room for the chosen size of underdrain and its surrounding gravel.

Underdrain pipe shall be acceptable vitrified clay or concrete pipe of standard thickness. Sewer pipe of the quality known as "seconds" will be acceptable.

Underdrains, if used, shall be laid at an approved distance below the bottom of the normal excavation and with open joints wrapped in cheesecloth, and entirely surrounded by graded gravel, or crushed stone to prevent the admission of sand or other soil into the underdrains. The distance between the bottom of the pipe or structure and the top of the bell of the underdrain pipe shall be at least 3 inches unless otherwise permitted. The space between the underdrain and the pipe or structure shall be filled with screened gravel or crushed stone which shall be rammed if necessary and left with a surface suitable for laying the pipe or building the structure.

- c. Drainage Wellpoint System. If necessary, the Contractor shall dewater the excavations by means of an efficient drainage wellpoint system which will drain the soil and prevent saturated soil from flowing into the excavation. The wellpoints shall be designed especially for this type of service. The pumping unit shall be designed for use with the wellpoints, and shall be capable of maintaining a high vacuum and, of handling large volumes of air and water at the same time.

The installation of the wellpoints and pump shall be done under the supervision of a competent representative of the manufacturer. The Contractor shall do all special work such as surrounding the wellpoints with sand or gravel or other work which is necessary for the wellpoint system to operate for the successful dewatering of the excavations.

3.7 Trench Excavation. Where pipe is to be laid in gravel bedding or concrete cradle, the trench may be excavated by machinery to, or to just below, the designated subgrade, provided that the material remaining at the bottom of the trench is no more than slightly disturbed.

Where pipe is to be laid directly on the trench bottom, the lowest part of trenches in earth shall not be excavated to subgrade by machinery, but just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joint except for limited areas where the use of pipe slings may have disturbed the bottom.

3.8 Depth of Trench. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, or depths of cover indicated on the drawings and as specified.

3.9 Width of Trench. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.

Trenches shall be excavated with approximately vertical sides between the elevation of the center of the pipe and an elevation one foot above the top of the pipe.

3.10 Trench Excavation in Fill. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least one foot above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall be excavated as though in undisturbed material.

3.11 Excavation Near Existing Structures. Attention is directed to the fact that there are pipes, drains, and other utilities in certain locations. Some of these have indicated on the drawings, but no attempt has been made to show all of the services and the completeness of accuracy of the information given is not guaranteed.

As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools. Such manual excavation when incidental to normal excavation shall be included in the work to be done under items involving normal excavation.

Where determination of the exact location of pipe or other underground structure is necessary for doing the work properly, the Contractor may be required to excavate test pits to determine such locations. When such test pits may be properly considered as incidental to other excavation, the Contractor shall receive no additional compensation, the work being understood to be included as part of the excavation. When the Engineer orders test pits beyond the limits of excavation he considers a part of the work, such test pits shall be paid for as specified under MEASUREMENT AND PAYMENT.

3.12 Protection of Existing Structures. All existing pipes, poles, wires, fences, curbing, property line markers and other structures which the Engineer decided must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from injury by the Contractor. Should such items be injured, they shall be restored by the Contractor, without compensation, to at least as good condition as that in which they were found immediately before the work was begun.

3.13 Relocation and Replacement of Existing Structures. Whenever the Contractor encounters certain existing structures as described below and is so ordered in writing, he shall do the whole or such portions of the work as he may be directed, to change the location of, remove and later restore, replace such structures, or to assist the owner thereof in so doing. For all such work the Contractor shall be paid under such items of work as may be applicable, other as Extra Work.

In removing existing pipes or other structures, the Contractor shall use care to avoid damage to materials, and the Engineer shall include for payment only those new materials which, in his judgment, are necessary to replace those unavoidably damaged.

The structures to which the provisions of the preceding two paragraphs shall apply include pipes, wires and other structures which meets all of the following: (a) are not indicated on the drawings otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.

When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) later restore them to at least as good condition as that in which they were found immediately before the work was begun, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.14 Care and Restoration of Property. The Contractor shall enclose the trunks of trees adjacent to his work and not to be cut, with substantial wooden boxes of such height as may be necessary to protect them from injury from piled material, from equipment, from his operations, or otherwise due to his work. Excavation machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.

Branches, limbs, and roots shall be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. In case of cutting or unavoidable injury to branches, limbs, and trunks or trees, the cut or injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.

Cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations shall be protected by suitable means or shall be dug up and temporarily replanted and maintained. After the construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kinds and quality at least equal to the kinds and quality existing at the start of the work.

On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment the treads or wheels of which are so shaped as to cut otherwise injure such surfaces.

In locations where excavation passes through existing agricultural areas and fields, the cost of repairing the trench surface is to be included in the pipe laying price.

In such areas, the existing loam and surface materials are to be stripped and placed on one side prior to excavation. After completion of backfilling, this "saved" surface material is to be returned to the top of the trench. After natural settlement and compaction has taken place, the trench surface is to be harrowed, dragged and mechanically raked as necessary to produce a smooth and level surface. The area is then to be sowed with "orchard grass" or "rye grass" or other such materials to hold the soil and produce a growth similar to that existing prior to pipe laying operations.

This provision for clean-up in agricultural areas applies only to locations where the trench surface is now substantially pasture land or the equivalent thereof. In cases where the trench

surface running alongside a road is in scrub growth or natural weed growth, this provision will not apply.

All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately before work was begun. Suitable materials and methods shall be used for such restoration.

The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

3.15 Unauthorized Excavation. If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with thoroughly compacted, screened gravel, if the excavation was for a pipeline, or with Class B concrete, if the excavation was for a masonry structure.

3.16 Elimination of Unsuitable Material. If material unsuitable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted screened gravel, bank-run gravel, fine aggregate or concrete as directed.

3.17 Disposal of Surplus Excavated Materials. No excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or approved.

Surplus excavated materials suitable for backfill shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes within a haul of one mile from the point of excavation; all as directed or approved and without additional compensation.

Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him.

3.18 Dust Control. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, so as to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use liquid calcium chloride for more effective dust control, the Contractor shall furnish and spread the material as directed.

3.19 Bridging Trenches. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings where requires for the accommodation of travel, and to provide access to private property during construction, and shall remove said structures thereafter.

3.20 Backfilling – General. In general, and unless other material is indicated on the drawings or specified, material used for backfilling trenches and excavations around structures shall be suitable material which was removed in the course of making the construction excavations.

Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required, before new backfill is placed.

Wherever a percentage of compaction for backfill is indicated or specified, it shall be the percent of maximum density at optimum moisture as determined by Method D of ASTM Standard Methods of Test for Moisture – Density Relations of Soils Using 10 lbs. Rammer and 18-inch Drop, Designation D1157-70.

3.21 Fill and Backfill Under Structures. Unless otherwise indicated or specified, all fill and backfill under structures and pavements adjacent to structures shall be compacted bank-run gravel containing not more than ten percent material passing a 200 sieve. When coarse aggregate and fine aggregate are indicated or specified for use under structures, they shall conform to the requirements for coarse and fine aggregate specified under CONCRETE MASONRY.

The fill and backfill materials shall be placed in layers not exceeding 6 inches in thickness. Unless otherwise indicated or specified, each layer shall be compacted to 95 percent.

3.22 Backfilling Around Structures. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done, special leakage tests, if required, shall be made. Promptly after the completion of such tests, the backfilling shall be started and then shall proceed until its completion.

The best of the excavated materials shall be used in backfilling within two feet of the structures. Unequal soil pressures shall be avoided by depositing the material evenly around the structures. The material shall be placed and compacted to 90 percent unless otherwise indicated or specified.

3.23 Backfilling Pipe Trenches. As soon as practicable after the pipes have been laid and the joints have acquired a suitable degree of hardness, if applicable, or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, the backfilling shall be started and thereafter it shall proceed until its completion.

With the exception mentioned below in this paragraph, trenches shall not be backfilled at pipe joints until after that section of the pipeline has successfully passed any specified test required. Should the Contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, he may, at his own risk backfill the entire trench, omitting or including backfill at joints as soon as practicable after the joints have acquired a suitable degree of strength. He shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe.

- a. **Materials.** The nature of materials will govern both their acceptability for backfill and the methods best suited for their placement and compaction in the backfill. No stone or rock fragment larger than 12 inches in greatest dimension shall be placed in the backfill nor shall

large masses of backfill material be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than five feet. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up as directed.

- b. Zone Around Pipe. The zone around the pipe shall be backfilled with the materials and to the limits indicated on the drawings. Material shall be compacted to 90 percent by tamping.
- c. Remainder of Trench. The remainder of the trench above the zone around the pipe shall be compacted by tamping, puddling, or water-jetting, in accordance with the nature of the material and the compaction requirements. In general, the tamping method will be used by the Contractor to achieve the desired compaction. Water-jetting or puddling may be used only if, in the opinion of the Engineer, it is necessary to employ one of these methods.
- d. Water-Jetting. If the backfill is to be compacted by water-jetting, the material shall be placed in the trench and then shall be thoroughly saturated throughout its full depth and at frequent intervals across and along the trench until all slumping ceases. To accomplish this, the Contractor shall furnish one or more jet pipes, each of sufficient length to reach to the specified depth and of sufficient diameter (not less than 1 ¼ inches) to supply an adequate flow of water to compact the material. The jet pipe shall be equipped with a quick-acting valve and be supplied through a fire hose from a hydrant or a pump having adequate pressure and capacity.
- e. Puddling. If the backfill is to be compacted by puddling, the material shall be deposited in water of sufficient depth so that the material will be submerged when in place. Dams or dikes constructed in the trench to hold the water used for puddling shall be compacted by tamping as specified below.
- f. Tamping. If the material is to be compacted by tamping, or under appropriate circumstances, rolling, the material shall be deposited and spread in uniform, parallel layers not exceeding 8 inches thick before compaction. Before the next layer is placed, each layer shall be tamped as required so as to obtain a thoroughly compacted mass. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar powered equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling and compacting as furnished by the Contractor.

If necessary to ensure proper compaction by tamping (or rolling), the material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.

- g. Miscellaneous Requirements. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only approved quantities of stones and rock fragments shall be used in the backfill; the Contractor shall, as part of the work done under the items involving earth excavation and rock excavation as appropriate, furnish and place all other necessary backfill material.

All voids left by removal of sheeting shall be completely backfilled with suitable materials, and thoroughly compacted.

Excavated material which is acceptable to the Engineer for surfacing or pavement sub-base shall be placed at the top of the backfill to such depths as may be specified elsewhere or as directed. The surface shall be brought to the required grade and stones raked out and removed.

3.24 Material for Filling and Embankments. Approved selected materials available from the excavations and not required for backfill around pipes or against structures, shall be used for filling and building embankments, except as otherwise specified. The contractor shall be responsible to handle this material, stockpile, and re-handle it as directed; all without additional compensation. Material needed in addition to that available from construction operations shall be obtained from approved gravel banks or other approved deposits.

All material, whether from the excavations or from borrow, shall be made of such nature that after it's been placed and properly compacted, it will make a dense, stable fill. It shall not contain vegetation, masses of roots, individual roots, more than 18 inches long, or more than ½ inch in diameter, stones over 6 inches in diameter, or porous matter. Organic matter shall not exceed minor quantities and shall be well distributed.

3.25 Preparation of Subgrade. The Contractor shall remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas upon which embankments will be built or material will be placed for grading. The subgrade shall be shaped as indicated on the drawings and shall be so prepared by forking, furrowing, or plowing that the first layer of the new material placed thereon will be well bonded to it.

3.26 Placing and Compacting Embankment Material. After the subgrade has been prepared as hereinbefore specified, the material shall be placed thereon and built up in successive layers until it has reached the required elevation.

Layers shall not exceed 12 inches in thickness before compaction. In embankments at structures, the layers shall have a slight downward slope away from the structure; in other embankments the layers shall have a slight downward slope away from the center. In general, the finer and less pervious materials shall be placed against the structures or in the center, and the coarser and more pervious materials, upon the outer parts of embankments.

Each layer of material shall be compacted by the use of approved rollers or other approved means so as to secure a dense, stable, and thoroughly compacted mass. At such points as cannot be reached by mobile mechanical equipment, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.

Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions shall be taken as may be necessary to obtain proper compaction.

The portion of embankment constructed below proposed structures shall be compacted to 95 percent. The top two feet of an embankment below a pavement base shall be compacted to 95 percent. All other embankments shall be compacted to 90 percent.

ITEM 4

ROCK EXCAVATION AND DISPOSAL

- 4.1 General
- 4.2 Explosives
- 4.3 Blasting Precautions
- 4.4 Excess Rock Excavation
- 4.5 Blasting Records
- 4.6 Shattering Rock
- 4.7 Shatter Rock
- 4.8 Preparation of Rock Surfaces
- 4.9 Removal of Boulders
- 4.10 Backfilling Rock Excavations
- 4.11 Disposal of Excavated Rock

4.1 General. The Contractor shall excavate rock if encountered, to the lines and grades indicated on the drawings or as directed, shall dispose of the excavated material, and shall furnish acceptable material for back fill in place of the excavated rock.

In general, rock in pipe trenches shall be excavated so as to be not less than 6 inches from the pipe after it has been laid. Before the pipe is laid, the trench shall be backfilled to the correct subgrade with thoroughly compacted, suitable material or, when so specified or indicated on the drawings, with the same material as that required for bedding the pipe, furnished and placed at the expense of the Contractor.

4.2 Explosives. The Contractor shall keep explosives on the site only in such quantity as may be needed for the work under way and only during such time as they are being used. The Contractor shall notify the Engineer, in advance, of its intention to store and use explosives. Explosives shall be stored in a secure manner and separate from all tools. Caps or detonators shall be safely stored at a point over 100 feet distant from the explosives. When the need for explosives has ended, all such materials remaining on the work shall be promptly removed from the premises.

The Contractor shall observe all State, Federal and Municipal laws, ordinance, and regulations relating to the transportation, storage, handling and use of explosives. In the event that any of the above mentioned laws, ordinance, or regulations required a license blaster to perform or supervise the work of blasting, said licensed blaster shall, at all times, have his/her license on the work and shall permit examination thereof by the Engineer or other officials having jurisdiction.

4.3 Blasting Precautions. All operations involving explosives shall be conducted with all possible care to avoid injury to persons and property. Blasting shall be done only with such quantities and strengths of explosives and in such manner as will break the rock approximately to the intended lines and grades and yet will leave the rock not to be excavated in an unshattered condition. Care shall be taken to avoid excessive cracking of the rock upon or against which any

structure will be built, and to prevent injury to existing pipes or other structures and property above or below ground. Rock shall be well covered with logs or mats, or both, where required. Sufficient warning shall be given to all persons in the vicinity of the work before a charge is exploded.

All blasting shall be completed within a distance of 50 feet before any portion of a masonry structure is placed or any pipe is laid.

4.4 Excess Rock Excavation. If rock is excavated beyond the limits of payment indicated on the drawings specified, or authorized in writing by the Engineer, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled, by and at the expense of the Contractor, as specified below in this section.

In pipe trenches, excess excavation below the elevation of the top of the bedding, cradle or envelope, shall be filled with material of the same type, placed and compacted in the same manner, as specified for the bedding, cradle, or envelope. Excess excavation above said elevation shall be filled with earth as specified in the section titled, "Backfilling Pipe Trenches" under EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

In excavation for structures, excess excavation in rock beneath foundations shall be filled with concrete, which shall be Class A or Class B, at the option of the Contractor. Other excess excavation shall be filled with Earth Excavation, Backfill, Fill and Grading. Any pavement or utility, outside normal trench limits, disturbed or damaged by blasting or excavation or rock shall be restored to its original condition or replaced, if deemed necessary by the Engineer, without additional compensation.

4.5 Blasting Records. The Contractor shall keep and submit to the Engineer an accurate record of each blast. The record shall show the general location of the blast, the depth and number of drillholes, the kind and quantity of explosive used, and other data required for a complete record.

4.6 Shattering Rock. Shattering rock at ends of pipe and elsewhere as indicated on the drawings, shall be done by drilling and blasting a single line of holes in the vertical face of the rock at the end of the trench. Drillholes shall have a minimum depth of four feet and maximum spacing of 18 inches on centers. Sufficient explosive shall be used to shatter the rock for future excavation. Shattering shall be completed before any pipe or fitting is placed within 50 feet of rock to be shattered.

4.7 Shattered Rock. If the rock below normal depth is shattered due to drilling or blasting operations of the Contractor, and the Engineer considers such shattered rock to be unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled with concrete as required, except that in pipe trenches screened gravel shall be used for backfill. All such removal and backfilling shall be done by and at the expense of the Contractor.

4.8 Preparation of Rock Surfaces. Whenever so directed during the progress of the work, the Contractor shall remove all dirt and loose rock from designated areas and shall clean the surface of the rock thoroughly, using steam to melt snow and ice, if necessary. Water in depressions shall then be removed as required so that the whole surface of the designated area can be inspected to determine whether seams or other defects exist.

The surfaces of rock foundations shall be left sufficiently rough to bond well with the masonry and embankments to be built thereon and, if required, shall be cut to rough benches or steps.

Before any masonry or embankment is built on or against the rock, the rock shall be scrupulously freed from all vegetation, dirt, sand, clay, boulders, scale, excessively cracked rock, loose fragments, ice, snow, and other objectionable substances. Picking, barring, wedging, streams of water under sufficient pressure, stiff brushes, hammers, steam jets, and other effective means shall be used to accomplish this cleaning. All free water left on the surface of the rock shall be removed.

4.9 Removal of Boulders. Piles of boulders or loose rock encountered within the limits of earth embankments shall be removed to a suitable place of disposal.

4.10 Backfilling Rock Excavations. Where rock has been excavated and the excavation is to be backfilled, the backfilling above normal depth shall be done as specified under EARTH EXCAVATION, BACKFILL, FILL AND GRADING. If material suitable for backfilling is not available in sufficient quantity from other excavations, the Contractor shall, at its own expense, furnish suitable material from outside sources. Excavated rock may not be used in backfilling trenches

4.11 Disposal of Excavated Rock. Excavated rock shall not be used in backfilling trenches and shall be disposed of as specified in Section 3.17 "Disposal of Surplus Excavated Materials." under EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

ITEM 5 PROCESSED GRAVEL BASE

- 5.1 General
- 5.2 Processed Gravel
- 5.3 Placement and Compaction

5.1 General. The processed gravel base shall conform to the specifications set forth in the following sub-sections.

5.2 Processed Gravel. Processed gravel shall consist of clean, hard, durable particles or fragments, free from an excess of soft thin elongated, laminated or disintegrated pieces, and shall conform to the following gradation requirements. Crushed rock of comparable size and grading may be used.

<u>Sieve</u>	<u>Percent Passing</u>
2 inch	100%
1 ½ inch	70-100%
¾ inch	50-85%
No. 4	30-60%
No. 200	0-12%

All processed gravel must be approved prior to placement. The Contractor shall deliver suitable samples of processed gravel to the Engineer for testing purposes. At the end of a 48 hour period, the Engineer shall either accept or reject the material.

5.3 Placement and Compaction. The base course shall be placed to the depths indicated on the drawings and/or as specified by the Engineer or his/her representatives. The gravel shall be placed in a maximum of 4-inch lifts and shall be thoroughly compacted to not less than 95% of the maximum dry density.

ITEMS 6 & 7 CONSTRUCTING WATER MAINS

General
Water Pipe
Joints
Handling of Pipe
Installation
Pressure & Leakage (Hydrostatic) Testing
Disinfection

General. Under this Item, the Contractor shall furnish and install all water pipe required for the project and as indicated on the Plans and as herein specified.

The work shall include the purchase of the pipe, hauling of the pipe to the project location, installation of pipe to accurate alignment and grade, jointing of the pipe, thrust blocks, yolks, tie rods, cleaning, disinfection and flushing of the completed pipeline, testing of the pipeline, backfilling, and all other work of a similar nature necessary for or in conjunction with the installation and acceptance of the pipeline.

The work covered by the pipeline Items shall include excavation, all pumping and bailing and water control measures required; backfill and compaction as specified disposal of excess or unsatisfactory material; clean up of the work site, and maintenance of trench surfaces and adjacent work areas.

The nominal depth of earth cover required on all pipelines constructed under this Contract is 5 feet. This earth cover shall be measured from the finished grade directly over the pipe. At certain locations, where specified on the plans, or where required due to tie-ins or location of existing utilities, the earth cover will be increased or decreased as necessary. No alteration in the unit prices specified under the pipeline Items will be made for this increase or decrease in earth cover.

Deviations Occasioned by Other Structures. Wherever obstructions not shown on the plans are encountered during the progress of the work and interfere to such an extent that an alteration in the plan is required, the Engineer shall have the authority to change the plans and order a deviation from the line and grade or arrange with the owners of the structures for the removal, relocation or reconstruction of the obstructions. At locations where obstructions such as culverts, ducts, wires and/or pipes are encountered, the water mains will be laid over or under such obstacles with a minimum clearance of 12 inches, or as specified by the Engineer.

Interruption of Service. It will be the Contractor's responsibility to notify all homeowners, who will be without water as a result of any interruption in service, 24 hours prior to said interruption.

No valve or other control device on the existing water system shall be operated for any purpose whatsoever by the Contractor. No tap or cut-in to the existing water system shall be made by the Contractor without the approval of the Engineer.

When the Contractor's operations require the adjustment of any hydrant, valves, or other control device on the existing system, the Engineer will provide authorized personnel for the operation of these control devices.

Water Pipe. All pipe, fittings, and accessories shall conform to the requirements of the following standard specifications as applicable:

**AMERICAN NATIONAL
STANDARD INSTITUTE STANDARDS**

(A21.50-1965) A21.1-1967	AN Standard for thickness Design of Cast Iron (Ductile-Type) Pipe
(AWWA C150)	AN Standard for the Thickness Design of Ductile Iron Pipe.
A21.4-1971 (AWWA C140)	AN Standard Specifications for Cement Mortar Lining for Ductile Iron Pipe and Fittings For Water
A21.6-1970 and (AWWA C106)	AN Standard Specifications for Cast Iron Pipe Centrifugally Cast in Metal Molds, for Water & Other Liquids
A21.10-1971 and Supplement (AWWA C110) A21.10a-197s	AN Standard Specifications for Gray- Iron and Ductile-Iron fittings, 2- Inches through 48-Inches for Water and Other Liquids
A21.11-1972 (AWWA C111)	AN Standard Specifications for Rubber Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe & Fittings
(AWWA C153)	AN Standard Specification for Ductile Iron Compact Fittings 3" through 12"
A21.51-1976 (AWWA C151)	AN Standard Specification for Iron Pipe Centrifugally Cast in Metal Molds for Water or Other Liquids

All pipe shall be ductile iron, class 52 and shall be marked with weight and class before shipment.

Standardized mechanical joint pipe shall be furnished with rubber gaskets.

All iron pipe shall be provided with a cement mortar lining, double thickness, in accordance with AWWA Specifications C-104. The cement mortar lining shall be seal coated. The exterior of the pipe shall be given a standard bituminous coating of coal tar or asphalt having a 1 mil. minimum thickness.

All flanges and similar machined surfaces shall be coated with a rust preventative and shall be covered or wrapped to protect them from mechanical damage.

Pipe Design. Pipe shall be fabricated in permanent type plants located in this country by a manufacturer having a background of experience in this type of fabrication work of at least 15 years.

On all iron pipe, the Contractor shall make provisions for the electrical continuity of the pipeline. This may be accomplished either by placing bronze or copper wire jumpers across the joint or inserting bronze or copper wedges into the joint.

Joints. All iron pipe joints shall be push on, mechanical, flange conforming to the requirements of the following Standard Specifications as applicable.

A21.10-1971 and
Supplement
A21.10a-1972

AN Standard Specifications for Gray-
Iron and Ductile Iron Fittings
2-inches through 48-inches for water
and other liquids.

A21.11-1972
(AWWA C111)

AN Standard Specifications for
Rubber Gasket Joints for Cast-Iron
and Ductile-Iron Pressure Pipe and
Fittings.

On pipelines employing joints such as "Push On", Standardized Mechanical Joint, or other similar joints, the joint is to be prepared and assembled in accordance with the manufacturer's directions. the gasket is to be as furnished by the pipe manufacturer and the joint is to be assembled using lubricants, follower rings, and bolts furnished by the manufacturer.

Push On Joints. All Push on Rubber Gasket Joints shall be Tyton Joint (R) or approved equal.

Mechanical Joints. The spigot is to be centered in the bell of the adjacent pipe after both the spigot and the bell have been carefully cleaned, wire-brushed and lubricated with soapy water. The gasket is then to be pushed home into the bell and is to be followed by the follower ring.

The bolts are to be tightened using torque measuring or torque indicating wrenches. The normal range of torque to be applied to the joints is as follows:

<u>Bolt Size (Inches)</u>	<u>Range at Torque Ft. Lb.</u>	<u>Length of Wrench</u>
5/8"	40-60	8"
3/4"	60-90	10"
1"	70-100	12"

When tightening bolts, the gland or follower ring must be brought up toward the pipe flange evenly, maintaining approximately the same distance between the gland and the base of the flange at all points around the socket. This is to be done by partially tightening up opposite bolts, first at the bottom, then at the top, then at either side and finally the intermediate bolts. This cycle is to be repeated until all bolts are within the above range of torque.

If effective sealing of the joint is not obtained at the maximum torque indicated, the joint must be disassembled and reassembled after thorough cleaning. Overstressing of the bolts to compensate for poor installation practice is not approved.

Flanged joints have been specified at certain locations where it is deemed desirable or necessary to restrain a branch valve. These flanges shall comply with American Standard 125# flanges, flat face. Alternate methods for restraint of branch valves will be considered by the Engineer if submitted by the Contractor.

Flanged Joints. The faces of all flanges shall be cleaned and wire-brushed prior to assembly. All tar or other coating is to be removed with solvent. The Contractor may lubricate the face to the flange if it so desires.

All gaskets are to be at least 1/16" thick and are to be composed of asbestos or similar material.

All bolts are to be tightened up uniformly and evenly until the joint is completely assembled. Opposite bolts are to be brought up snug until all bolts are in this condition. The operation is then to be repeated on opposite bolts, further tightening then until maximum tension is reached.

Handling of Pipe. Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, and valves shall be carefully lowered into the trench piece by piece by means of a derrick, ropes or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

Inspection. All pipe and fittings shall be carefully inspected for defects prior to placing them in the trench.

All cast iron pipe shall, while suspended above grade by the pipe-laying machine, be rung with a light hammer to detect cracks.

Cleaning Pipe and Fittings. All lumps, blisters and excess coal-tar coating shall be removed from the bell-and-spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and dry and free from oil and grease before the pipe is laid.

On all cast iron or ductile iron pipe using a rubber type joint, the bell of the pipe and the spigot of the adjacent pipe are to be wire-brushed and cleaned of all rust and dirt. The bell of the pipe and the spigot of the adjacent pipe are then to be lubricated with the joint lubricant furnished with the pipe and used in accordance with the manufacturer's directions.

All materials furnished by the Contractor shall be delivered and distributed at the site by the Contractor. Cast iron pipe, ductile iron pipe, fittings, valves, hydrants and the accessories shall be

loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground.

In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

Care of Pipe Coating and Lining. Pipe shall be so handled that the coating and lining will not be damaged. If any part of the coating is damaged, the repair shall be made by the Contractor at its expense in a manner satisfactory to the Engineer. If the cement lining is damaged the pipe shall be rejected and removed from the site.

Installation. Excavation and backfill are to be planned and carried out so that the trench can be adequately supported and drained for the safety of the workmen therein and so that pipe-laying operations can be carried out efficiently and satisfactorily.

Backfilling as hereinafter specified is to be carried on as close as possible behind the pipe-laying operation. Thus, the routine operation of excavation, pipe-laying and backfilling will result in a relatively short operation and the least amount of hindrance to adjacent land owners, pedestrian traffic and vehicle traffic.

Upon completion of operations at the end of the work day, or upon the halting of operations for any reason whatsoever, backfill is to be completed so that only on length of pipe is exposed in open trench. If deemed advisable by the Engineer because of ground or traffic conditions, the Contractor may be ordered to completely backfill the entire trench at the end of the work day or upon ceasing pipe-laying operation for any reason whatsoever. All backfilling must comply with specifications set forth in the appropriate subsection of Item 2 of these specifications.

Width of Trench. The width of trench shall be ample to permit the pipe to be laid and jointed and the backfill to be placed and compacted as specified. The trench width shall be sufficient to permit the convenient placing of supports, sheathing and/or bracing and for the handling of drainage and ground water where required.

At locations where valves, fittings, or specials are to be installed, the Contractor may provide such additional width of excavation as is required for the satisfactory installation and jointing of these items.

Since the ability of the pipe to support external loads is related to trench width and decreased as trench width increases, the trench width must be maintained as narrow as possible, consistent with pipe-laying requirements. The portion of the trench from 1 ft. above the top of the pipe to the bottom limit of excavation should not be wider than the pipe diameter plus 2 feet.

Bell Holes. At each joint the Contractor will be permitted to provide extra excavation at the sides of the trench and underneath the pipe to permit the joint to be made properly.

Pipe Clearance in Rock. Ledge, rock, boulders and large stones shall be removed to provide clearance of at least 6 in. below and on each side of all pipe, valves, and fittings.

The specified minimum clearances are the minimum clear distances which will be permitted between any part of the pipe and appurtenances being laid any part, projection or point of such rock, boulder or stone.

Excavation to Grade. The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground at every point between bell holes. **The final excavation shall be done using hand tools so that the finished sub-grade of the pipe is accurately prepared and is undisturbed.**

Any part of the bottom of the trench excavated below the required sub-grade shall be corrected with approved material, thoroughly compacted as directed by the Engineer.

Excavation Below Grade. In locations where the trench bottom is composed of cemented gravel, hard pan or other materials that cannot be properly prepared to provide uniform and continuous support for the pipe, the Contractor will be required to excavated at least 3" and not more than 6" below the specified sub-grade for the pipe.

The earth used for backfill under the pipe is to be sand or other granular native material satisfactory to the Engineer, and shall be place and compacted prior to installing the pipe.

Permissible Deflection at Joints. Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions or plumb stems, or where long-radius curves are permitted, the amount of deflection allowed shall not exceed that recommended by the AWWA Specifications and the manufacturer and shall be approved by the Engineer.

Any drainage, sanitary sewer, or water mains or services, broken by the Contractor during its operations shall be repaired by the Contractor, at its expense, according to Standard Greenfield Specifications.

Piling Excavated Material. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clear or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed.

Trenching by Hand or Machine. In general, it is expected that the major portion of the excavation will be carried out using machine methods.

The final portion of excavation in the trench bottom is to be carried out using hand methods as described under Item 3.7 under EARTH EXCAVATION, BACKFILL, FILL AND GRADING so as to prevent disturbance to the supporting sub-grade.

In special locations where the use of machinery for excavation may result in damage to adjacent pipelines, or structures, the Contractor will be required to use hand methods of excavation. This is especially applicable in the immediate vicinity of conduits, service pipes and other pipelines where the use of machinery could result in danger.

Laying Pipe. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made to the adjacent pipe. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.

When laying a rubber-jointed, cast iron or ductile iron pipe, the spigot end shall be centered in the bell; the pipe forced home and the joint completely assembled. The pipe is then to be adjusted to correct line and grade and to be secured in place with approved backfill material, properly tamped under and around the pipeline. The Contractor shall then make provisions for the electrical continuity of the pipe.

At all times when pipe-laying is not in progress, the open ends of pipe shall be closed by a water-tight plug or other means approved by the Engineer. This provision shall apply during the noon hour and overnight, as well as during delays in the pipe-laying operations.

Cutting Pipe. All pipe furnished on the job will be furnished in full lengths. All cutting of cast iron or ductile iron pipe required for inserting valves, fittings, or closure pieces and all cutting of pipes required for nipple pieces shall be done by the Contractor in a neat and workmanlike manner without damage to the pipe or cement lining. The cutting is to be done so as to leave a smooth end at right angles to the axis of the pipe.

On cast-iron pipe using rubber joints, the outside edge of the cut end must be tapered back approximately 1/8" at an angle of about 30 degrees so as to provide for the proper assembly of this joint. This beveling of the outside edge of the end of the pipe can be done with a coarse file or portable grinder.

Direction of Laying. The direction of the pipe laying is to be approved by the Engineer. In general, the pipe is to be laid with the bell facing in the direction of laying. In areas of steep grade the pipe is to be laid with the bells facing uphill and laying is to proceed in an uphill direction.

Unsuitable Laying Conditions. No pipe is to be laid in water, in an unsuitable trench or during unsuitable weather conditions.

Blocking. The use of blocking to support the pipelines during construction and prior to placement of backfill is not acceptable.

Anchorage for Fittings & Specials. Thrust blocks of machine-mixed, poured-in-place concrete, having a 28-day compressive strength of 4000 psi shall be placed at all tees, dead ends and similar locations. Pipelines shall be protected from direct adherence of the concrete thrust block by being wrapped in plastic sheeting or roofing felt and the thrust blocks shall not bear directly on pipe joints and shall not interfere with future adjustments or tightening of the joints. All thrust blocks shall bear against undisturbed soil at the side of the trench and this undisturbed soil shall be carefully cleaned off so that the bearing surface is vertical. Thrust blocks shall have a minimum horizontal thickness of 2 feet and shall have the following bearing surfaces measured perpendicular to the direction of the thrust:

20" pipe.36 sq. ft. (9' x 4')

16" pipe.	21 sq. ft. (7' x 3")
12" pipe.	12 sq. ft. (6' x 2')
8" pipe or less.	6 sq. ft. (2' x 3')

Metal Harness. At certain locations as shown on the plan or as otherwise specified, especially at caps and plugs located at dead-ends and at elbows located above grade, the use of a metal harness to prevent movement will be specified. Metal harnesses to consist of adjustable tie-rods and clamps of adequate strength to prevent movement under the full load.

The metal clamps and rods are to be fabricated as shown on the Standard Details and after installation, are to be painted with an asphalt or bituminous paint to prevent corrosion.

Pressure and Leakage (Hydrostatic) Testing.

Test Restrictions. On completion of the pipeline, it is to be filled with water and tested. Water used for this purpose is to be drawn from the existing water system by the Contractor under direction of the Engineer.

A hydrostatic test and a leakage test are to be run simultaneously. The pressure for these two tests is to be 150 psi or shall not be less than 1.25 times the working pressure at the highest point along the test section. Test pressure shall not exceed pipe or thrust-restraint design pressures.

The hydrostatic test shall be of at least 2-hour duration. Test pressure shall not vary by more than +5 psi for the duration of the test.

On pipelines where the elevation along the route of construction varies substantially the Engineer reserves the right to valve off and test portions of the line. Also on extensive construction jobs, the Engineer reserves the right to require the testing of individual portions of the line as construction proceeds rather than await completion of the entire project in order to undertake a pressure or leakage test.

Pressurization. After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure at the point of testing. Each valved section of pipe shall be slowly filled with water, and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the owner. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.

Air Removal. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Owner.

Examination. Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that

are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to the owner. Any visible leaks in exposed pipe, fittings or valve seat shall be repaired and made water tight regardless of the "allowable leakage" amount.

Time for Making Test. No pipeline is to be placed under pressure or subjected to hydrostatic pressure until at least 5 days have elapsed after the concrete thrust blocks have been installed. If high early strength concrete is used in the concrete thrust blocks, the hydrostatic pressure can be applied to the main after 2 days have elapsed from time of construction of the thrust blocks.

Procedure. Each section of pipeline to be tested shall be slowly filled with water from the existing system. The operation of gate valves connected to the existing system is to be carried out by authorized personnel, provided by the Engineer.

After the new portion of the line has been brought up to normal operating pressure, all air shall be expelled from the pipeline. Hydrants and blow-offs are to be used for this purpose insofar as possible. The Contractor will be required to make additional taps at points of highest elevation in the pipeline in order to completely remove all air.

After the new line has been placed under normal operating pressure and all air has been expelled, the pressure and leakage test will be started. The pipeline under test is to be raised to the specified pressure. The Contractor will be required to furnish the specified pressure. The Contractor will be required to furnish a pump, pipe connections, all necessary apparatus and connections to the new main.

The Owner will furnish all gauges and meters required. The Contractor will raise the pressure in the new section of main to the specified test pressure by means of the pump, using clean water from the existing water system and will maintain the specified pressure for a period of 4 hours or until the Engineer indicates that the pipeline is satisfactory. Should any test of pipe laid disclose leakage greater than that specified, the Contractor shall, at its own expense, locate and repair the defective joints until the leakage is within the specified allowance.

Pressure and Leakage Tests after Backfilling. Pipelines using a rubber type joint and on other such pipelines or at such locations as are approved by the Engineer, the Contractor will be allowed to complete backfilling as hereinafter specified, prior to undertaking the leakage & pressure tests. The carrying out of backfilling prior to the conducting of the necessary tests will be at the option of the Contractor with the exception of intersections, driveways, crosswalks and other such locations where the holding open of the trench will adversely affect the public.

If defects are found after backfill during the course of the pressure and leakage tests the Contractor will be required to carry out such excavation as is required to make the necessary repairs and all work is to be done at its own expense. The tests will be repeated until such time as the water main is found to be in satisfactory condition.

Leakage Defined. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

Allowable Leakage. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD P}{133,200} \quad (\text{Eq 1})$$

Where:

- L = Allowable leakage, in gallons per hour
- S = length of pipe tested, in feet
- D = nominal diameter of the pipe, in inches
- P = average test pressure during the leakage test, in pounds per square inch (gauge)

These formulas are based on an allowable leakage of 11.65 gpd/mi/in of nominal diameter at a pressure of 150 psi. Allowable leakage at various pressures is shown in the following table.

Allowable Leakage per 1000 ft. of Pipeline - gpht

Avg. Test Pressure psi	<u>Nominal Pipe Diameter - in.</u>					
	3	4	6	8	10	12
450	0.48	0.64	0.95	1.27	1.59	1.91
400	0.45	0.60	0.90	1.20	1.50	1.80
350	0.42	0.56	0.84	1.12	1.40	1.69
300	0.39	0.52	0.78	1.04	1.30	1.56
275	0.37	0.50	0.75	1.00	1.24	1.49
250	0.36	0.47	0.71	0.95	1.19	1.42
225	0.34	0.45	0.68	0.90	1.13	1.35
200	0.32	0.43	0.64	0.85	1.06	1.28
175	0.30	0.40	0.59	0.80	0.99	1.19
150	0.28	0.37	0.55	0.74	0.92	1.10
125	0.25	0.34	0.50	0.67	0.84	1.01
100	0.23	0.30	0.45	0.60	0.75	0.90

*If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

**To obtain leakage in litres/hour, multiply the values in the table by 3.785.

When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gph/in. of nominal valve size shall be allowed.

When hydrants are in the test section, the test shall be made against closed hydrant valves.

Acceptance of Installation. Acceptance shall be determined on the basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified herein, the Contractor shall, at its own expense, locate and make approved repairs as necessary until the leakage is within the specified allowance.

All visible leaks are to be repaired, regardless of the amount of leakage.

Disinfection. A newly installed main shall be disinfected in accordance with ANSI/AWWA C651. Following chlorination, the main should be flushed as soon as possible (within 24 hours) since prolonged exposure to high concentrations of chlorine might damage the asphaltic seal coating.

Disinfection. The completed pipeline is to be disinfected with a chlorine concentration of approximately 50ppm prior to being placed in service. The introduction of this chlorine is to be accomplished by pumping granulated chlorine into the new main.

The chlorinated water is to remain in the new pipeline for a period of 24 hours. During this period, proper precautions are to be taken to prevent this chlorinated water from flowing back into the existing system. At the end of the 24 hour period the concentration of chlorine shall be at least 25 ppm. If this concentration is not present after the 24 hour period, then the disinfection process shall be repeated until the concentration of 25 ppm is achieved.

At all locations where cut-ins are to be made to the existing system, and it is not possible to disinfect and test the piping and joints in the normal manner, then the interior of each pipe and fitting shall be cleaned, and washed out with ordinary household bleach before being installed. The joints in these connections must be inspected under pressure before being backfilled.

Blowing Out. After all disinfection and testing is completed, the Contractor will be required to blow out the new water mains under the direction of the Engineer. Blowing out of the main is to be accomplished at as high a velocity as possible consistent with the ability of the existing system to supply water and the ability of the area around the blow-off point to drain the water off. After clean water substantially free of chlorine is obtained at the blow-off, that is, a residual chlorine concentration of 0.2 ppm or less, the flow of water at reduced rates is to be continued for at least one hour.

Test samples of water shall than be taken to the City of Greenfield Water Pollution Control Facility for testing of bacteria levels. If, after the testing is completed, the water quality is in accordance with Section 5, of the Drinking Water Regulations of Massachusetts, promulgated by the Department of Environmental Quality Engineering, Commonwealth of Massachusetts, effective June 24, 1977 the new main is to be placed in service. However, the main is to be checked occasionally to determine if any build-up of chlorine or taste occurs. If any build-up does occur, a blow-off is to be operated at a slow rate for a period sufficient to clear the pipe-line.

Suggested Method of Testing. It is suggested that the Contractor test the line in the following order:

1. Pressure and Leakage Test.
2. Disinfection.

Any other method of testing must be approved by the Engineer.

ITEMS 8 & 9

DUCTILE IRON FITTINGS

General
Iron Fittings
Sleeve Type Couplings
Joints
Retainer Glands

General. The Contractor shall furnish and install all the necessary increasers, reducers, elbows, bevels, tees, closure pieces, adapters, caps and similar fittings as shown or indicated on the plans. Any additional iron fittings required because of unexpected underground utilities or site conditions will be included under this item.

Iron Fittings. Iron fittings shall be in accordance with AWWA C-153 for Ductile Iron Fittings 3" through 12".

Ductile Iron Fittings shall be rated for 350 psi operating pressure (Class 350).

All fittings shall be plainly marked for weight and class. Fittings of sub-standard weight or dimensions will not be accepted.

Standardized mechanical joint fittings shall be furnished with rubber gaskets.

All iron fittings shall be provided with a cement mortar lining, double-thickness in accordance with AWWA Specification C-104. The cement mortar lining shall be of twice the standard or normal thickness. The cement mortar lining shall be seal-coated. The exterior of the fittings shall be given a standard bituminous coating of coal tar or asphalt having a 1 mil. minimum thickness.

All flanges and similar machined surfaces shall be coated with a rust preventative and shall be covered or wrapped to protect them from mechanical damage.

Sleeve Type couplings. Prior to connecting to existing pipes, the Contractor shall gauge the outside diameter of the existing pipe and shall supply and install standard, oversized, or special fittings, as necessary, subject to the approval of the Engineer.

Joints. All joints shall conform to the specifications set forth under "Mechanical Joints" or as specified.

Retainer Glands. Mechanical joint fittings are required for all ductile iron water pipe.

- A. Standard retainers shall be used on all straight fittings ie: sleeves, reducers, gates, etc.
- B. All other fittings ie: bends, tees, etc. shall have restrained type retaining glands.

Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against

the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A 536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist off nuts shall be used to insure proper actuating of the restraining devices.

The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG or equal.

On cast iron pipe, mechanical joint glands are required, however, all joints will be rodded. The megalug retainers or approved equal are not to be used on cast iron.

ITEMS 20 & 24 BITUMINOUS CONCRETE PATCH

- 24.1 General
- 24.2 Gravel Base Course
- 24.3 Bituminous Concrete Pavement
- 24.4 Maintaining Pavements Under This Contract

24.1 General. The Contractor shall furnish all labor, materials, tools, and equipment necessary to construct the pavement, complete, including base, and surface courses on paved areas as indicated on the drawings and as herein specified.

Pavement courses shall conform to the applicable requirements of the Commonwealth of Massachusetts, Department of Public Works Standard Specifications for Highways and Bridges, 2023 Edition, including all amendments, hereinafter referred to as the Standard Specifications.

The paving plant used by the Contractor in the preparation of the bituminous concrete shall be acceptable to the Engineer who shall have the right to inspect the Plant and the making of the material.

All manhole covers, catch basin grates, valve and meter boxes, curbs, walks and walls shall be adequately protected and left in a clean condition.

24.2 Gravel Base. Gravel base shall conform to the specifications set forth in Item 5 of these specifications.

24.3 Bituminous Concrete Pavement. Permanent patch shall consist of a 2.5-inch binder course and a 1.5-inch top course of bituminous concrete placed in two separate operations on the previously prepared gravel base.

The bituminous concrete shall be Class I bituminous concrete pavement, Type I-1, as specified, in the Standard Specifications. A steel wheel roller, having a weight of not less than 240 lbs. per

inch width of tread, and equipped with a device for watering the roller, shall be used on both courses. No oil will be allowed on the rollers.

24.4 Maintaining Pavements Under This Contract. Until the expiration of the guarantee period, the Contractor shall maintain pavements under this contract. Should an area that the Contractor has patched settle, the Contractor will remove the entire patch in the area and shall restore the area to the required grade.

CLOSEOUT

Summary. Section includes:

- a. Documentation required for the transfer of the completed Work to the Owner
- b. Final Cleaning

Submittals.

- a. As-built drawings
- b. Evidence of payment and release of liens
- c. List of Subcontractors

Substantial Completion. Refer to the General Conditions, for procedures relating to obtaining Substantial Completion.

Project Closeout Documents. As-Built Drawings - Submit as-built drawings for review, approval, or comment. The drawings shall show any and all deviations from the original drawings. The drawings shall depict the location of all piping, valves, and field changes. All underground work shall be actively tied in a minimum of two horizontal directions with vertical control. All fittings, bends, valves and other appurtenances shall be shown.

Provide evidence of payment and release of liens.

Provide list of Subcontractors including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

Final Payment. The Contract shall be considered complete and final payment made, only when:

- a. All provisions of the Contract Documents have been strictly adhered to.
- b. The project and premises have been left in good order, including removal of all temporary construction, Contractor-owned and extraneous materials.

Cleaning. Remove and entirely dispose of material or debris that has washed, flowed or has been placed in existing watercourses, ditches, gutters, drains, pipe, or structures, for work done under the Contract work limits. Leave ditches, channels, drains, pipes, structures, and watercourses in a clean and neat condition upon completion of the Work.

Restore or replace any public or private property damaged or removed during the course of the Work. Property shall be returned to a condition at least equal to that existing immediately prior

to the beginning of operations. Complete all highway or driveway, walk, and landscaping work using suitable materials, equipment and methods. Perform restoration of existing property, signs or structures promptly as work progresses; do not leave restoration work until the end of the Contract Time.

APPENDIX A
MASSACHUSETTS WAGE RATES



MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

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

Prevailing Wage Rates

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

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: City of Greenfield
Contract Number: DPW 24-01 **City/Town:** GREENFIELD
Description of Work: Construction and testing of app. 1,983 LF of new 12-Inch DICL water main, app. 150 LF of which will be hung from the Nash's Mill Rd. Bridge and insulated, and related work to include trench patching.
Job Location: Nash's Mill Road

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$35.95	\$13.41	\$16.01	\$0.00	\$65.37
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.02	\$13.41	\$16.01	\$0.00	\$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.14	\$13.41	\$16.01	\$0.00	\$65.56
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$34.25	\$9.40	\$16.59	\$0.00	\$60.24
	12/01/2023	\$34.88	\$9.40	\$16.59	\$0.00	\$60.87
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$34.25	\$9.40	\$14.53	\$0.00	\$58.18
	12/01/2023	\$34.88	\$9.40	\$14.53	\$0.00	\$58.81
	06/01/2024	\$36.08	\$9.40	\$14.53	\$0.00	\$60.01
	12/01/2024	\$37.28	\$9.40	\$14.53	\$0.00	\$61.21
	06/01/2025	\$38.53	\$9.40	\$14.53	\$0.00	\$62.46
	12/01/2025	\$39.77	\$9.40	\$14.53	\$0.00	\$63.70
	06/01/2026	\$41.07	\$9.40	\$14.53	\$0.00	\$65.00
	12/01/2026	\$42.36	\$9.40	\$14.53	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	12/01/2020	\$34.29	\$12.80	\$8.95	\$0.00	\$56.04
ASPHALT RAKER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$33.75	\$9.40	\$14.53	\$0.00	\$57.68
	12/01/2023	\$34.38	\$9.40	\$14.53	\$0.00	\$58.31
	06/01/2024	\$35.58	\$9.40	\$14.53	\$0.00	\$59.51
	12/01/2024	\$36.78	\$9.40	\$14.53	\$0.00	\$60.71
	06/01/2025	\$38.03	\$9.40	\$14.53	\$0.00	\$61.96
	12/01/2025	\$39.27	\$9.40	\$14.53	\$0.00	\$63.20
	06/01/2026	\$40.57	\$9.40	\$14.53	\$0.00	\$64.50
	12/01/2026	\$41.86	\$9.40	\$14.53	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.86	\$13.58	\$15.10	\$0.00	\$67.54
	12/01/2023	\$39.81	\$13.58	\$15.10	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.86	\$13.58	\$15.10	\$0.00	\$67.54
	12/01/2023	\$39.81	\$13.58	\$15.10	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.33	\$13.58	\$15.10	\$0.00	\$67.01
	12/01/2023	\$39.28	\$13.58	\$15.10	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$34.25	\$9.40	\$16.59	\$0.00	\$60.24
	12/01/2023	\$34.88	\$9.40	\$16.59	\$0.00	\$60.87
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$34.25	\$9.40	\$14.53	\$0.00	\$58.18
	12/01/2023	\$34.88	\$9.40	\$14.53	\$0.00	\$58.81
	06/01/2024	\$36.08	\$9.40	\$14.53	\$0.00	\$60.01
	12/01/2024	\$37.28	\$9.40	\$14.53	\$0.00	\$61.21
	06/01/2025	\$38.53	\$9.40	\$14.53	\$0.00	\$62.46
	12/01/2025	\$39.77	\$9.40	\$14.53	\$0.00	\$63.70
	06/01/2026	\$41.07	\$9.40	\$14.53	\$0.00	\$65.00
	12/01/2026	\$42.36	\$9.40	\$14.53	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2023	\$47.37	\$7.07	\$20.31	\$0.00	\$74.75
	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$30.79	\$7.07	\$13.22	\$0.00	\$51.08
2	65	\$30.79	\$7.07	\$13.22	\$0.00	\$51.08
3	70	\$33.16	\$7.07	\$14.23	\$0.00	\$54.46
4	75	\$35.53	\$7.07	\$15.24	\$0.00	\$57.84
5	80	\$37.90	\$7.07	\$16.25	\$0.00	\$61.22
6	85	\$40.26	\$7.07	\$17.28	\$0.00	\$64.61
7	90	\$42.63	\$7.07	\$18.28	\$0.00	\$67.98
8	95	\$45.00	\$7.07	\$19.32	\$0.00	\$71.39

Effective Date - 01/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:4

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)</i>	02/01/2023	\$48.76	\$11.49	\$20.37	\$0.00	\$80.62
	08/01/2023	\$50.81	\$11.49	\$20.37	\$0.00	\$82.67
	02/01/2024	\$52.06	\$11.49	\$20.37	\$0.00	\$83.92
	08/01/2024	\$53.31	\$11.49	\$20.37	\$0.00	\$85.17
	02/01/2025	\$54.61	\$11.49	\$20.37	\$0.00	\$86.47
	08/01/2025	\$56.76	\$11.49	\$20.37	\$0.00	\$88.62
	02/01/2026	\$58.11	\$11.49	\$20.37	\$0.00	\$89.97
	08/01/2026	\$60.31	\$11.49	\$20.37	\$0.00	\$92.17
	02/01/2027	\$61.71	\$11.49	\$20.37	\$0.00	\$93.57

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.38	\$11.49	\$20.37	\$0.00	\$56.24
2	60	\$29.26	\$11.49	\$20.37	\$0.00	\$61.12
3	70	\$34.13	\$11.49	\$20.37	\$0.00	\$65.99
4	80	\$39.01	\$11.49	\$20.37	\$0.00	\$70.87
5	90	\$43.88	\$11.49	\$20.37	\$0.00	\$75.74

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.41	\$11.49	\$20.37	\$0.00	\$57.27
2	60	\$30.49	\$11.49	\$20.37	\$0.00	\$62.35
3	70	\$35.57	\$11.49	\$20.37	\$0.00	\$67.43
4	80	\$40.65	\$11.49	\$20.37	\$0.00	\$72.51
5	90	\$45.73	\$11.49	\$20.37	\$0.00	\$77.59

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING <i>ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	06/01/2023	\$38.86	\$13.58	\$15.10	\$0.00	\$67.54
	12/01/2023	\$39.81	\$13.58	\$15.10	\$0.00	\$68.49
CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$44.73	\$9.40	\$17.97	\$0.00	\$72.10
	12/01/2023	\$45.98	\$9.40	\$17.97	\$0.00	\$73.35
	06/01/2024	\$47.46	\$9.40	\$17.97	\$0.00	\$74.83
	12/01/2024	\$48.93	\$9.40	\$17.97	\$0.00	\$76.30
	06/01/2025	\$50.43	\$9.40	\$17.97	\$0.00	\$77.80
	12/01/2025	\$51.93	\$9.40	\$17.97	\$0.00	\$79.30
	06/01/2026	\$53.48	\$9.40	\$17.97	\$0.00	\$80.85
	12/01/2026	\$54.98	\$9.40	\$17.97	\$0.00	\$82.35

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$43.58	\$9.40	\$17.97	\$0.00	\$70.95
	12/01/2023	\$44.83	\$9.40	\$17.97	\$0.00	\$72.20
	06/01/2024	\$46.31	\$9.40	\$17.97	\$0.00	\$73.68
	12/01/2024	\$47.78	\$9.40	\$17.97	\$0.00	\$75.15
	06/01/2025	\$49.28	\$9.40	\$17.97	\$0.00	\$76.65
	12/01/2025	\$50.78	\$9.40	\$17.97	\$0.00	\$78.15
	06/01/2026	\$52.33	\$9.40	\$17.97	\$0.00	\$79.70
	12/01/2026	\$53.83	\$9.40	\$17.97	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$43.58	\$9.40	\$17.97	\$0.00	\$70.95
	12/01/2023	\$44.83	\$9.40	\$17.97	\$0.00	\$72.20
	06/01/2024	\$46.31	\$9.40	\$17.97	\$0.00	\$73.68
	12/01/2024	\$47.78	\$9.40	\$17.97	\$0.00	\$75.15
	06/01/2025	\$49.28	\$9.40	\$17.97	\$0.00	\$76.65
	12/01/2025	\$50.78	\$9.40	\$17.97	\$0.00	\$78.15
	06/01/2026	\$52.33	\$9.40	\$17.97	\$0.00	\$79.70
	12/01/2026	\$53.83	\$9.40	\$17.97	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN</i>	03/01/2023	\$39.76	\$7.71	\$18.15	\$0.00	\$65.62

Apprentice - CARPENTER - Local 336 Hampden Hampshire Franklin

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.88	\$7.71	\$1.38	\$0.00	\$28.97
2	60	\$23.86	\$7.71	\$1.38	\$0.00	\$32.95
3	70	\$27.83	\$7.71	\$13.95	\$0.00	\$49.49
4	75	\$29.82	\$7.71	\$13.95	\$0.00	\$51.48
5	80	\$31.81	\$7.71	\$15.35	\$0.00	\$54.87
6	80	\$31.81	\$7.71	\$15.35	\$0.00	\$54.87
7	90	\$35.78	\$7.71	\$16.75	\$0.00	\$60.24
8	90	\$35.78	\$7.71	\$16.75	\$0.00	\$60.24

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$26.46/ 3&4 \$31.82/ 5&6 \$50.38/ 7&8 \$55.77

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS-ZONE 3 (Wood Frame)</i>	04/01/2023	\$24.16	\$7.21	\$4.80	\$0.00	\$36.17
All Aspects of New Wood Frame Work						

Classification			Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - CARPENTER (Wood Frame) - Zone 3								
Effective Date - 04/01/2023								
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment	Total Rate	
1	60	\$14.50		\$7.21	\$0.00	\$0.00	\$21.71	
2	60	\$14.50		\$7.21	\$0.00	\$0.00	\$21.71	
3	65	\$15.70		\$7.21	\$0.00	\$0.00	\$22.91	
4	70	\$16.91		\$7.21	\$0.00	\$0.00	\$24.12	
5	75	\$18.12		\$7.21	\$3.80	\$0.00	\$29.13	
6	80	\$19.33		\$7.21	\$3.80	\$0.00	\$30.34	
7	85	\$20.54		\$7.21	\$3.80	\$0.00	\$31.55	
8	90	\$21.74		\$7.21	\$3.80	\$0.00	\$32.75	
Notes:								
% Indentured After 10/1/17; 45/45/55/55/70/70/80/80								
Step 1&2 \$17.86/ 3&4 \$20.22/ 5&6 \$27.57/ 7&8 \$29.94								
Apprentice to Journeyworker Ratio:1:5								
CEMENT MASONRY/PLASTERING			01/01/2023	\$44.81	\$12.70	\$17.97	\$0.87	\$76.35
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)			07/01/2023	\$45.82	\$12.70	\$17.97	\$0.87	\$77.36
			01/01/2024	\$46.83	\$12.70	\$17.97	\$0.87	\$78.37

Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.41	\$12.70	\$15.49	\$0.00	\$50.60
2	60	\$26.89	\$12.70	\$17.97	\$0.87	\$58.43
3	65	\$29.13	\$12.70	\$17.97	\$0.87	\$60.67
4	70	\$31.37	\$12.70	\$17.97	\$0.87	\$62.91
5	75	\$33.61	\$12.70	\$17.97	\$0.87	\$65.15
6	80	\$35.85	\$12.70	\$17.97	\$0.87	\$67.39
7	90	\$40.33	\$12.70	\$17.97	\$0.87	\$71.87

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.91	\$12.70	\$15.49	\$0.00	\$51.10
2	60	\$27.49	\$12.70	\$17.97	\$0.87	\$59.03
3	65	\$29.78	\$12.70	\$17.97	\$0.87	\$61.32
4	70	\$32.07	\$12.70	\$17.97	\$0.87	\$63.61
5	75	\$34.37	\$12.70	\$17.97	\$0.87	\$65.91
6	80	\$36.66	\$12.70	\$17.97	\$0.87	\$68.20
7	90	\$41.24	\$12.70	\$17.97	\$0.87	\$72.78

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
COMPRESSOR OPERATOR	06/01/2023	\$38.33	\$13.58	\$15.10	\$0.00	\$67.01
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.28	\$13.58	\$15.10	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CRANE OPERATOR	06/01/2023	\$42.36	\$13.58	\$15.10	\$0.00	\$71.04
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$43.31	\$13.58	\$15.10	\$0.00	\$71.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE)	01/01/2023	\$56.06	\$8.65	\$23.05	\$0.00	\$87.76
PAINTERS LOCAL 35 - ZONE 3	07/01/2023	\$57.26	\$8.65	\$23.05	\$0.00	\$88.96
	01/01/2024	\$58.46	\$8.65	\$23.05	\$0.00	\$90.16
	07/01/2024	\$59.66	\$8.65	\$23.05	\$0.00	\$91.36
	01/01/2025	\$60.86	\$8.65	\$23.05	\$0.00	\$92.56

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$8.65	\$0.00	\$0.00	\$36.68
2	55	\$30.83	\$8.65	\$6.27	\$0.00	\$45.75
3	60	\$33.64	\$8.65	\$6.84	\$0.00	\$49.13
4	65	\$36.44	\$8.65	\$7.41	\$0.00	\$52.50
5	70	\$39.24	\$8.65	\$19.63	\$0.00	\$67.52
6	75	\$42.05	\$8.65	\$20.20	\$0.00	\$70.90
7	80	\$44.85	\$8.65	\$20.77	\$0.00	\$74.27
8	90	\$50.45	\$8.65	\$21.91	\$0.00	\$81.01

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.63	\$8.65	\$0.00	\$0.00	\$37.28
2	55	\$31.49	\$8.65	\$6.27	\$0.00	\$46.41
3	60	\$34.36	\$8.65	\$6.84	\$0.00	\$49.85
4	65	\$37.22	\$8.65	\$7.41	\$0.00	\$53.28
5	70	\$40.08	\$8.65	\$19.63	\$0.00	\$68.36
6	75	\$42.95	\$8.65	\$20.20	\$0.00	\$71.80
7	80	\$45.81	\$8.65	\$20.77	\$0.00	\$75.23
8	90	\$51.53	\$8.65	\$21.91	\$0.00	\$82.09

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN	06/01/2023	\$43.73	\$9.40	\$17.82	\$0.00	\$70.95
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$44.98	\$9.40	\$17.82	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	06/01/2023	\$44.73	\$9.40	\$17.82	\$0.00	\$71.95
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$45.98	\$9.40	\$17.82	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS	06/01/2023	\$44.48	\$9.40	\$17.82	\$0.00	\$71.70
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$45.73	\$9.40	\$17.82	\$0.00	\$72.95
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER	06/01/2023	\$44.73	\$9.40	\$17.82	\$0.00	\$71.95
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$45.98	\$9.40	\$17.82	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR	06/01/2023	\$44.48	\$9.40	\$17.82	\$0.00	\$71.70
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$45.73	\$9.40	\$17.82	\$0.00	\$72.95
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER	06/01/2023	\$43.73	\$9.40	\$17.82	\$0.00	\$70.95
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$44.98	\$9.40	\$17.82	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN (Including Core Drilling) <i>ELECTRICIANS LOCAL 7</i>	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47

Apprentice - *ELECTRICIAN - Local 7*

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.80	\$7.50	\$0.56	\$0.00	\$26.86
2	45	\$21.15	\$7.50	\$0.63	\$0.00	\$29.28
3	50	\$23.51	\$12.50	\$7.26	\$0.00	\$43.27
4	55	\$25.86	\$12.50	\$7.33	\$0.00	\$45.69
5	65	\$30.56	\$12.50	\$9.27	\$0.00	\$52.33
6	70	\$32.91	\$12.50	\$10.54	\$0.00	\$55.95

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3****

ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2023	\$61.13	\$16.08	\$20.56	\$0.00	\$97.77
	01/01/2024	\$61.98	\$16.18	\$20.96	\$0.00	\$99.12
	01/01/2025	\$62.83	\$16.28	\$21.36	\$0.00	\$100.47
	01/01/2026	\$63.68	\$16.38	\$21.76	\$0.00	\$101.82
	01/01/2027	\$64.53	\$16.48	\$22.16	\$0.00	\$103.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - ELEVATOR CONSTRUCTOR - Local 41

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.57	\$16.08	\$0.00	\$0.00	\$46.65
2	55	\$33.62	\$16.08	\$20.56	\$0.00	\$70.26
3	65	\$39.73	\$16.08	\$20.56	\$0.00	\$76.37
4	70	\$42.79	\$16.08	\$20.56	\$0.00	\$79.43
5	80	\$48.90	\$16.08	\$20.56	\$0.00	\$85.54

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.99	\$16.18	\$0.00	\$0.00	\$47.17
2	55	\$34.09	\$16.18	\$20.96	\$0.00	\$71.23
3	65	\$40.29	\$16.18	\$20.96	\$0.00	\$77.43
4	70	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
5	80	\$49.58	\$16.18	\$20.96	\$0.00	\$86.72

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER	01/01/2023	\$42.79	\$16.08	\$20.56	\$0.00	\$79.43
ELEVATOR CONSTRUCTORS LOCAL 41	01/01/2024	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
	01/01/2025	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
	01/01/2026	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
	01/01/2027	\$45.17	\$16.48	\$22.16	\$0.00	\$83.81
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	06/01/2023	\$33.75	\$9.40	\$14.53	\$0.00	\$57.68
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2023	\$34.38	\$9.40	\$14.53	\$0.00	\$58.31
	06/01/2024	\$35.58	\$9.40	\$14.53	\$0.00	\$59.51
	12/01/2024	\$36.78	\$9.40	\$14.53	\$0.00	\$60.71
	06/01/2025	\$38.03	\$9.40	\$14.53	\$0.00	\$61.96
	12/01/2025	\$39.27	\$9.40	\$14.53	\$0.00	\$63.20
	06/01/2026	\$40.57	\$9.40	\$14.53	\$0.00	\$64.50
	12/01/2026	\$41.86	\$9.40	\$14.53	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
OPERATING ENGINEERS LOCAL 98						
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
OPERATING ENGINEERS LOCAL 98						
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
OPERATING ENGINEERS LOCAL 98						
FIRE ALARM INSTALLER	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
ELECTRICIANS LOCAL 7						

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS</i>	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
<i>LOCAL 7</i> For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN	06/01/2023	\$38.33	\$13.58	\$15.10	\$0.00	\$67.01
<i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.28	\$13.58	\$15.10	\$0.00	\$67.96

Apprentice - OPERATING ENGINEERS - Local 98 Class 3

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.00	\$13.58	\$15.10	\$0.00	\$51.68
2	70	\$26.83	\$13.58	\$15.10	\$0.00	\$55.51
3	80	\$30.66	\$13.58	\$15.10	\$0.00	\$59.34
4	90	\$34.50	\$13.58	\$15.10	\$0.00	\$63.18

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.57	\$13.58	\$15.10	\$0.00	\$52.25
2	70	\$27.50	\$13.58	\$15.10	\$0.00	\$56.18
3	80	\$31.42	\$13.58	\$15.10	\$0.00	\$60.10
4	90	\$35.35	\$13.58	\$15.10	\$0.00	\$64.03

Notes:

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

Apprentice to Journeyworker Ratio:1:6

FLAGGER & SIGNALER (HEAVY & HIGHWAY)	06/01/2023	\$25.98	\$9.40	\$14.41	\$0.00	\$49.79
<i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2023	\$25.98	\$9.40	\$14.41	\$0.00	\$49.79
	06/01/2024	\$27.01	\$9.40	\$14.41	\$0.00	\$50.82
	12/01/2024	\$27.01	\$9.40	\$14.41	\$0.00	\$50.82
	06/01/2025	\$28.09	\$9.40	\$14.41	\$0.00	\$51.90
	12/01/2025	\$28.09	\$9.40	\$14.41	\$0.00	\$51.90
	06/01/2026	\$29.21	\$9.40	\$14.41	\$0.00	\$53.02
	12/01/2026	\$29.21	\$9.40	\$14.41	\$0.00	\$53.02
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FLOORCOVERER	03/01/2022	\$39.66	\$7.71	\$18.15	\$0.00	\$65.52
<i>FLOORCOVERERS LOCAL 2168 ZONE III</i>						

Apprentice - FLOORCOVERER - Local 2168 Zone III

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.83	\$7.71	\$1.40	\$0.00	\$28.94
2	55	\$21.81	\$7.71	\$1.40	\$0.00	\$30.92
3	60	\$23.80	\$7.71	\$13.95	\$0.00	\$45.46
4	65	\$25.78	\$7.71	\$13.95	\$0.00	\$47.44
5	70	\$27.76	\$7.71	\$15.35	\$0.00	\$50.82
6	75	\$29.75	\$7.71	\$15.35	\$0.00	\$52.81
7	80	\$31.73	\$7.71	\$16.75	\$0.00	\$56.19
8	85	\$33.71	\$7.71	\$16.75	\$0.00	\$58.17

Notes: Steps are 750 hrs.

% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)

Step 1&2 \$26.21/ 3&4 \$31.49/ 5&6 \$49.96/ 7&8 \$55.29

Apprentice to Journeyworker Ratio:1:1

FORK LIFT	06/01/2023	\$38.55	\$13.58	\$15.10	\$0.00	\$67.23
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.50	\$13.58	\$15.10	\$0.00	\$68.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATORS/LIGHTING PLANTS	06/01/2023	\$35.10	\$13.58	\$15.10	\$0.00	\$63.78
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$36.05	\$13.58	\$15.10	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	06/01/2020	\$39.18	\$10.80	\$10.45	\$0.00	\$60.43
GLAZIERS LOCAL 1333						

Apprentice - GLAZIER - Local 1333

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$32.19
2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$34.64
3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$37.74
4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$40.19
5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$43.34
6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$45.78
7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$55.53
8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

GRADER/TRENCHING MACHINE/DERRICK	06/01/2023	\$38.86	\$13.58	\$15.10	\$0.00	\$67.54
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.81	\$13.58	\$15.10	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2023	\$41.30	\$10.64	\$17.54	\$2.05	\$71.53
	07/01/2023	\$42.55	\$10.64	\$17.54	\$2.05	\$72.78
	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i>	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2023	\$41.30	\$10.64	\$17.54	\$2.05	\$71.53
	07/01/2023	\$42.55	\$10.64	\$17.54	\$2.05	\$72.78
	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$34.25	\$9.40	\$14.53	\$0.00	\$58.18
	12/01/2023	\$34.88	\$9.40	\$14.53	\$0.00	\$58.81
	06/01/2024	\$36.08	\$9.40	\$14.53	\$0.00	\$60.01
	12/01/2024	\$37.28	\$9.40	\$14.53	\$0.00	\$61.21
	06/01/2025	\$38.53	\$9.40	\$14.53	\$0.00	\$62.46
	12/01/2025	\$39.77	\$9.40	\$14.53	\$0.00	\$63.70
	06/01/2026	\$41.07	\$9.40	\$14.53	\$0.00	\$65.00
	12/01/2026	\$42.36	\$9.40	\$14.53	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	09/01/2022	\$44.05	\$13.80	\$17.14	\$0.00	\$74.99

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield

Effective Date - 09/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.03	\$13.80	\$12.42	\$0.00	\$48.25
2	60	\$26.43	\$13.80	\$13.36	\$0.00	\$53.59
3	70	\$30.84	\$13.80	\$14.31	\$0.00	\$58.95
4	80	\$35.24	\$13.80	\$15.25	\$0.00	\$64.29

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
IRONWORKER/WELDER	03/16/2023	\$38.91	\$8.25	\$22.70	\$0.00	\$69.86
IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)	09/16/2023	\$39.81	\$8.25	\$22.70	\$0.00	\$70.76
	03/16/2024	\$40.66	\$8.25	\$22.70	\$0.00	\$71.61

Apprentice - IRONWORKER - Local 7 Springfield

Effective Date - 03/16/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.35	\$8.25	\$22.70	\$0.00	\$54.30
2	70	\$27.24	\$8.25	\$22.70	\$0.00	\$58.19
3	75	\$29.18	\$8.25	\$22.70	\$0.00	\$60.13
4	80	\$31.13	\$8.25	\$22.70	\$0.00	\$62.08
5	85	\$33.07	\$8.25	\$22.70	\$0.00	\$64.02
6	90	\$35.02	\$8.25	\$22.70	\$0.00	\$65.97

Effective Date - 09/16/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.89	\$8.25	\$22.70	\$0.00	\$54.84
2	70	\$27.87	\$8.25	\$22.70	\$0.00	\$58.82
3	75	\$29.86	\$8.25	\$22.70	\$0.00	\$60.81
4	80	\$31.85	\$8.25	\$22.70	\$0.00	\$62.80
5	85	\$33.84	\$8.25	\$22.70	\$0.00	\$64.79
6	90	\$35.83	\$8.25	\$22.70	\$0.00	\$66.78

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
LABORER	06/01/2023	\$33.50	\$9.40	\$16.59	\$0.00	\$59.49
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.13	\$9.40	\$16.59	\$0.00	\$60.12

Apprentice - LABORER - Zone 3 Building & Site

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.10	\$9.40	\$16.59	\$0.00	\$46.09
2	70	\$23.45	\$9.40	\$16.59	\$0.00	\$49.44
3	80	\$26.80	\$9.40	\$16.59	\$0.00	\$52.79
4	90	\$30.15	\$9.40	\$16.59	\$0.00	\$56.14

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.48	\$9.40	\$16.59	\$0.00	\$46.47
2	70	\$23.89	\$9.40	\$16.59	\$0.00	\$49.88
3	80	\$27.30	\$9.40	\$16.59	\$0.00	\$53.29
4	90	\$30.72	\$9.40	\$16.59	\$0.00	\$56.71

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY)	06/01/2023	\$33.50	\$9.40	\$14.53	\$0.00	\$57.43
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2023	\$34.13	\$9.40	\$14.53	\$0.00	\$58.06
	06/01/2024	\$35.33	\$9.40	\$14.53	\$0.00	\$59.26
	12/01/2024	\$36.53	\$9.40	\$14.53	\$0.00	\$60.46
	06/01/2025	\$37.78	\$9.40	\$14.53	\$0.00	\$61.71
	12/01/2025	\$39.02	\$9.40	\$14.53	\$0.00	\$62.95
	06/01/2026	\$40.32	\$9.40	\$14.53	\$0.00	\$64.25
	12/01/2026	\$41.61	\$9.40	\$14.53	\$0.00	\$65.54

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - LABORER (Heavy & Highway) - Zone 3						
Effective Date - 06/01/2023						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.10	\$9.40	\$14.53	\$0.00	\$44.03
2	70	\$23.45	\$9.40	\$14.53	\$0.00	\$47.38
3	80	\$26.80	\$9.40	\$14.53	\$0.00	\$50.73
4	90	\$30.15	\$9.40	\$14.53	\$0.00	\$54.08
Effective Date - 12/01/2023						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.48	\$9.40	\$14.53	\$0.00	\$44.41
2	70	\$23.89	\$9.40	\$14.53	\$0.00	\$47.82
3	80	\$27.30	\$9.40	\$14.53	\$0.00	\$51.23
4	90	\$30.72	\$9.40	\$14.53	\$0.00	\$54.65
Notes:						
Apprentice to Journeyworker Ratio:1:5						
LABORER: CARPENTER TENDER						
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		06/01/2023	\$33.50	\$9.40	\$16.59	\$59.49
		12/01/2023	\$34.13	\$9.40	\$16.59	\$60.12
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER						
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		06/01/2023	\$33.50	\$9.40	\$16.59	\$59.49
		12/01/2023	\$34.13	\$9.40	\$16.59	\$60.12
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER						
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		06/01/2023	\$33.47	\$9.40	\$16.72	\$59.59
		12/01/2023	\$34.10	\$9.40	\$16.72	\$60.22
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER						
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		06/01/2023	\$34.50	\$9.40	\$16.59	\$60.49
		12/01/2023	\$35.13	\$9.40	\$16.59	\$61.12
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY)						
<i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>		06/01/2023	\$33.75	\$9.40	\$14.53	\$57.68
		12/01/2023	\$34.38	\$9.40	\$14.53	\$58.31
		06/01/2024	\$35.58	\$9.40	\$14.53	\$59.51
		12/01/2024	\$36.78	\$9.40	\$14.53	\$60.71
		06/01/2025	\$38.03	\$9.40	\$14.53	\$61.96
		12/01/2025	\$39.27	\$9.40	\$14.53	\$63.20
		06/01/2026	\$40.57	\$9.40	\$14.53	\$64.50
		12/01/2026	\$41.86	\$9.40	\$14.53	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER						
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		06/01/2023	\$33.50	\$9.40	\$16.59	\$59.49
		12/01/2023	\$34.13	\$9.40	\$16.59	\$60.12
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER						
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		06/01/2023	\$33.50	\$9.40	\$16.59	\$59.49
		12/01/2023	\$34.13	\$9.40	\$16.59	\$60.12
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	06/01/2023	\$33.75	\$9.40	\$14.53	\$0.00	\$57.68
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2023	\$34.38	\$9.40	\$14.53	\$0.00	\$58.31
	06/01/2024	\$35.58	\$9.40	\$14.53	\$0.00	\$59.51
	12/01/2024	\$36.78	\$9.40	\$14.53	\$0.00	\$60.71
	06/01/2025	\$38.03	\$9.40	\$14.53	\$0.00	\$61.96
	12/01/2025	\$39.27	\$9.40	\$14.53	\$0.00	\$63.20
	06/01/2026	\$40.57	\$9.40	\$14.53	\$0.00	\$64.50
	12/01/2026	\$41.86	\$9.40	\$14.53	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS	02/01/2023	\$39.73	\$11.49	\$19.53	\$0.00	\$70.75
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	08/01/2023	\$41.37	\$11.49	\$19.53	\$0.00	\$72.39
	02/01/2024	\$42.37	\$11.49	\$19.53	\$0.00	\$73.39
	08/01/2024	\$44.05	\$11.49	\$19.53	\$0.00	\$75.07
	02/01/2025	\$45.90	\$11.49	\$19.53	\$0.00	\$76.92
	08/01/2025	\$46.81	\$11.49	\$19.53	\$0.00	\$77.83
	02/01/2026	\$47.89	\$11.49	\$19.53	\$0.00	\$78.91
	08/01/2026	\$49.65	\$11.49	\$19.53	\$0.00	\$80.67
	02/01/2027	\$50.77	\$11.49	\$19.53	\$0.00	\$81.79

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.87	\$11.49	\$19.53	\$0.00	\$50.89
2	60	\$23.84	\$11.49	\$19.53	\$0.00	\$54.86
3	70	\$27.81	\$11.49	\$19.53	\$0.00	\$58.83
4	80	\$31.78	\$11.49	\$19.53	\$0.00	\$62.80
5	90	\$35.76	\$11.49	\$19.53	\$0.00	\$66.78

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.69	\$11.49	\$19.53	\$0.00	\$51.71
2	60	\$24.82	\$11.49	\$19.53	\$0.00	\$55.84
3	70	\$28.96	\$11.49	\$19.53	\$0.00	\$59.98
4	80	\$33.10	\$11.49	\$19.53	\$0.00	\$64.12
5	90	\$37.23	\$11.49	\$19.53	\$0.00	\$68.25

Notes:

Apprentice to Journeyworker Ratio:1:5

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick

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

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.86	\$13.58	\$15.10	\$0.00	\$67.54
	12/01/2023	\$39.81	\$13.58	\$15.10	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANIC/WELDER/BOOM TRUCK <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.33	\$13.58	\$15.10	\$0.00	\$67.01
	12/01/2023	\$39.28	\$13.58	\$15.10	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 3) <i>MILLWRIGHTS LOCAL 1121 - Zone 3</i>	01/02/2023	\$40.16	\$8.58	\$21.57	\$0.00	\$70.31

Apprentice - *MILLWRIGHT - Local 1121 Zone 3*

Effective Date - 01/02/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.09	\$8.58	\$5.72	\$0.00	\$36.39
2	65	\$26.10	\$8.58	\$17.93	\$0.00	\$52.61
3	75	\$30.12	\$8.58	\$18.98	\$0.00	\$57.68
4	85	\$34.14	\$8.58	\$20.01	\$0.00	\$62.73

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

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
OILER <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$34.04	\$13.58	\$15.10	\$0.00	\$62.72
	12/01/2023	\$35.27	\$13.58	\$15.10	\$0.00	\$63.95
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$32.04	\$13.58	\$15.10	\$0.00	\$60.72
	12/01/2023	\$32.99	\$13.58	\$15.10	\$0.00	\$61.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 3</i>	01/01/2023	\$56.06	\$8.65	\$23.05	\$0.00	\$87.76
	07/01/2023	\$57.26	\$8.65	\$23.05	\$0.00	\$88.96
	01/01/2024	\$58.46	\$8.65	\$23.05	\$0.00	\$90.16
	07/01/2024	\$59.66	\$8.65	\$23.05	\$0.00	\$91.36
	01/01/2025	\$60.86	\$8.65	\$23.05	\$0.00	\$92.56

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 01/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$8.65	\$0.00	\$0.00	\$36.68
2	55	\$30.83	\$8.65	\$6.27	\$0.00	\$45.75
3	60	\$33.64	\$8.65	\$6.84	\$0.00	\$49.13
4	65	\$36.44	\$8.65	\$7.41	\$0.00	\$52.50
5	70	\$39.24	\$8.65	\$19.63	\$0.00	\$67.52
6	75	\$42.05	\$8.65	\$20.20	\$0.00	\$70.90
7	80	\$44.85	\$8.65	\$20.77	\$0.00	\$74.27
8	90	\$50.45	\$8.65	\$21.91	\$0.00	\$81.01

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.63	\$8.65	\$0.00	\$0.00	\$37.28
2	55	\$31.49	\$8.65	\$6.27	\$0.00	\$46.41
3	60	\$34.36	\$8.65	\$6.84	\$0.00	\$49.85
4	65	\$37.22	\$8.65	\$7.41	\$0.00	\$53.28
5	70	\$40.08	\$8.65	\$19.63	\$0.00	\$68.36
6	75	\$42.95	\$8.65	\$20.20	\$0.00	\$71.80
7	80	\$45.81	\$8.65	\$20.77	\$0.00	\$75.23
8	90	\$51.53	\$8.65	\$21.91	\$0.00	\$82.09

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *

* If 30% or more of surfaces to be painted are new construction,
NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3

01/01/2023	\$38.93	\$8.65	\$19.15	\$0.00	\$66.73
07/01/2023	\$39.98	\$8.65	\$19.15	\$0.00	\$67.78
01/01/2024	\$41.08	\$8.65	\$19.15	\$0.00	\$68.88
07/01/2024	\$42.13	\$8.65	\$19.15	\$0.00	\$69.93
01/01/2025	\$43.23	\$8.65	\$19.15	\$0.00	\$71.03

Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.47	\$8.65	\$0.00	\$0.00	\$28.12
2	55	\$21.41	\$8.65	\$4.13	\$0.00	\$34.19
3	60	\$23.36	\$8.65	\$4.50	\$0.00	\$36.51
4	65	\$25.30	\$8.65	\$4.88	\$0.00	\$38.83
5	70	\$27.25	\$8.65	\$16.90	\$0.00	\$52.80
6	75	\$29.20	\$8.65	\$17.28	\$0.00	\$55.13
7	80	\$31.14	\$8.65	\$17.65	\$0.00	\$57.44
8	90	\$35.04	\$8.65	\$18.40	\$0.00	\$62.09

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.99	\$8.65	\$0.00	\$0.00	\$28.64
2	55	\$21.99	\$8.65	\$4.13	\$0.00	\$34.77
3	60	\$23.99	\$8.65	\$4.50	\$0.00	\$37.14
4	65	\$25.99	\$8.65	\$4.88	\$0.00	\$39.52
5	70	\$27.99	\$8.65	\$16.90	\$0.00	\$53.54
6	75	\$29.99	\$8.65	\$17.28	\$0.00	\$55.92
7	80	\$31.98	\$8.65	\$17.65	\$0.00	\$58.28
8	90	\$35.98	\$8.65	\$18.40	\$0.00	\$63.03

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2023	\$36.25	\$8.65	\$19.15	\$0.00	\$64.05
PAINTERS LOCAL 35 - ZONE 3	07/01/2023	\$37.30	\$8.65	\$19.15	\$0.00	\$65.10
	01/01/2024	\$38.40	\$8.65	\$19.15	\$0.00	\$66.20
	07/01/2024	\$39.45	\$8.65	\$19.15	\$0.00	\$67.25
	01/01/2025	\$40.55	\$8.65	\$19.15	\$0.00	\$68.35

Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint**Effective Date -** 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.13	\$8.65	\$0.00	\$0.00	\$26.78
2	55	\$19.94	\$8.65	\$4.13	\$0.00	\$32.72
3	60	\$21.75	\$8.65	\$4.50	\$0.00	\$34.90
4	65	\$23.56	\$8.65	\$4.88	\$0.00	\$37.09
5	70	\$25.38	\$8.65	\$16.90	\$0.00	\$50.93
6	75	\$27.19	\$8.65	\$17.28	\$0.00	\$53.12
7	80	\$29.00	\$8.65	\$17.65	\$0.00	\$55.30
8	90	\$32.63	\$8.65	\$18.40	\$0.00	\$59.68

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.65	\$8.65	\$0.00	\$0.00	\$27.30
2	55	\$20.52	\$8.65	\$4.13	\$0.00	\$33.30
3	60	\$22.38	\$8.65	\$4.50	\$0.00	\$35.53
4	65	\$24.25	\$8.65	\$4.88	\$0.00	\$37.78
5	70	\$26.11	\$8.65	\$16.90	\$0.00	\$51.66
6	75	\$27.98	\$8.65	\$17.28	\$0.00	\$53.91
7	80	\$29.84	\$8.65	\$17.65	\$0.00	\$56.14
8	90	\$33.57	\$8.65	\$18.40	\$0.00	\$60.62

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *

* If 30% or more of surfaces to be painted are new construction,
NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 3*

01/01/2023	\$37.53	\$8.65	\$19.15	\$0.00	\$65.33
07/01/2023	\$38.58	\$8.65	\$19.15	\$0.00	\$66.38
01/01/2024	\$39.68	\$8.65	\$19.15	\$0.00	\$67.48
07/01/2024	\$40.73	\$8.65	\$19.15	\$0.00	\$68.53
01/01/2025	\$41.83	\$8.65	\$19.15	\$0.00	\$69.63

Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.77	\$8.65	\$0.00	\$0.00	\$27.42
2	55	\$20.64	\$8.65	\$4.13	\$0.00	\$33.42
3	60	\$22.52	\$8.65	\$4.50	\$0.00	\$35.67
4	65	\$24.39	\$8.65	\$4.88	\$0.00	\$37.92
5	70	\$26.27	\$8.65	\$16.90	\$0.00	\$51.82
6	75	\$28.15	\$8.65	\$17.28	\$0.00	\$54.08
7	80	\$30.02	\$8.65	\$17.65	\$0.00	\$56.32
8	90	\$33.78	\$8.65	\$18.40	\$0.00	\$60.83

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.29	\$8.65	\$0.00	\$0.00	\$27.94
2	55	\$21.22	\$8.65	\$4.13	\$0.00	\$34.00
3	60	\$23.15	\$8.65	\$4.50	\$0.00	\$36.30
4	65	\$25.08	\$8.65	\$4.88	\$0.00	\$38.61
5	70	\$27.01	\$8.65	\$16.90	\$0.00	\$52.56
6	75	\$28.94	\$8.65	\$17.28	\$0.00	\$54.87
7	80	\$30.86	\$8.65	\$17.65	\$0.00	\$57.16
8	90	\$34.72	\$8.65	\$18.40	\$0.00	\$61.77

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2023	\$34.85	\$8.65	\$19.15	\$0.00	\$62.65
PAINTERS LOCAL 35 - ZONE 3	07/01/2023	\$35.90	\$8.65	\$19.15	\$0.00	\$63.70
	01/01/2024	\$37.00	\$8.65	\$19.15	\$0.00	\$64.80
	07/01/2024	\$38.05	\$8.65	\$19.15	\$0.00	\$65.85
	01/01/2025	\$39.15	\$8.65	\$19.15	\$0.00	\$66.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.43	\$8.65	\$0.00	\$0.00	\$26.08
2	55	\$19.17	\$8.65	\$4.13	\$0.00	\$31.95
3	60	\$20.91	\$8.65	\$4.50	\$0.00	\$34.06
4	65	\$22.65	\$8.65	\$4.88	\$0.00	\$36.18
5	70	\$24.40	\$8.65	\$16.90	\$0.00	\$49.95
6	75	\$26.14	\$8.65	\$17.28	\$0.00	\$52.07
7	80	\$27.88	\$8.65	\$17.65	\$0.00	\$54.18
8	90	\$31.37	\$8.65	\$18.40	\$0.00	\$58.42

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.95	\$8.65	\$0.00	\$0.00	\$26.60
2	55	\$19.75	\$8.65	\$4.13	\$0.00	\$32.53
3	60	\$21.54	\$8.65	\$4.50	\$0.00	\$34.69
4	65	\$23.34	\$8.65	\$4.88	\$0.00	\$36.87
5	70	\$25.13	\$8.65	\$16.90	\$0.00	\$50.68
6	75	\$26.93	\$8.65	\$17.28	\$0.00	\$52.86
7	80	\$28.72	\$8.65	\$17.65	\$0.00	\$55.02
8	90	\$32.31	\$8.65	\$18.40	\$0.00	\$59.36

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	06/01/2023	\$33.50	\$9.40	\$14.53	\$0.00	\$57.43
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2023	\$34.13	\$9.40	\$14.53	\$0.00	\$58.06
	06/01/2024	\$35.33	\$9.40	\$14.53	\$0.00	\$59.26
	12/01/2024	\$36.53	\$9.40	\$14.53	\$0.00	\$60.46
	06/01/2025	\$37.78	\$9.40	\$14.53	\$0.00	\$61.71
	12/01/2025	\$39.02	\$9.40	\$14.53	\$0.00	\$62.95
	06/01/2026	\$40.32	\$9.40	\$14.53	\$0.00	\$64.25
	12/01/2026	\$41.61	\$9.40	\$14.53	\$0.00	\$65.54
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER	12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B						
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
PILE DRIVER LOCAL 56 (ZONE 3)						
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
PILE DRIVER LOCAL 56 (ZONE 3)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PILE DRIVER - Local 56 Zone 3

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Notes:
Apprentice wages shall be no less than the following Steps;
(Same as set in Zone 1)
1\$57.06/2\$61.96/3\$66.87/4\$69.32/5\$71.78/6\$71.78/7\$76.68/8\$76.68

Apprentice to Journeyworker Ratio:1:5

PIPELAYER	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY)	06/01/2023	\$33.75	\$9.40	\$14.53	\$0.00	\$57.68
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2023	\$34.38	\$9.40	\$14.53	\$0.00	\$58.31
	06/01/2024	\$35.58	\$9.40	\$14.53	\$0.00	\$59.51
	12/01/2024	\$36.78	\$9.40	\$14.53	\$0.00	\$60.71
	06/01/2025	\$38.03	\$9.40	\$14.53	\$0.00	\$61.96
	12/01/2025	\$39.27	\$9.40	\$14.53	\$0.00	\$63.20
	06/01/2026	\$40.57	\$9.40	\$14.53	\$0.00	\$64.50
	12/01/2026	\$41.86	\$9.40	\$14.53	\$0.00	\$65.79

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

PLUMBER & PIPEFITTER	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
PLUMBERS & PIPEFITTERS LOCAL 104	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

Apprentice - PLUMBER/PIPEFITTER - Local 104

Effective Date - 03/17/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.13	\$9.55	\$10.10	\$0.00	\$40.78
2	50	\$23.48	\$9.55	\$10.10	\$0.00	\$43.13
3	55	\$25.83	\$9.55	\$10.10	\$0.00	\$45.48
4	60	\$28.18	\$9.55	\$10.10	\$0.00	\$47.83
5	65	\$30.52	\$9.55	\$10.10	\$0.00	\$50.17
6	70	\$32.87	\$9.55	\$10.10	\$0.00	\$52.52
7	75	\$35.22	\$9.55	\$10.10	\$0.00	\$54.87
8	80	\$37.57	\$9.55	\$10.10	\$0.00	\$57.22
9	80	\$37.57	\$9.55	\$17.10	\$0.00	\$64.22
10	80	\$37.57	\$9.55	\$17.10	\$0.00	\$64.22

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

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PNEUMATIC CONTROLS (TEMP.) <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$33.75	\$9.40	\$14.53	\$0.00	\$57.68
	12/01/2023	\$34.38	\$9.40	\$14.53	\$0.00	\$58.31
	06/01/2024	\$35.58	\$9.40	\$14.53	\$0.00	\$59.51
	12/01/2024	\$36.78	\$9.40	\$14.53	\$0.00	\$60.71
	06/01/2025	\$38.03	\$9.40	\$14.53	\$0.00	\$61.96
	12/01/2025	\$39.27	\$9.40	\$14.53	\$0.00	\$63.20
	06/01/2026	\$40.57	\$9.40	\$14.53	\$0.00	\$64.50
	12/01/2026	\$41.86	\$9.40	\$14.53	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$34.50	\$9.40	\$16.59	\$0.00	\$60.49
	12/01/2023	\$35.13	\$9.40	\$16.59	\$0.00	\$61.12
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$34.50	\$9.40	\$14.53	\$0.00	\$58.43
	12/01/2023	\$35.13	\$9.40	\$14.53	\$0.00	\$59.06
	06/01/2024	\$36.33	\$9.40	\$14.53	\$0.00	\$60.26
	12/01/2024	\$37.53	\$9.40	\$14.53	\$0.00	\$61.46
	06/01/2025	\$38.78	\$9.40	\$14.53	\$0.00	\$62.71
	12/01/2025	\$40.02	\$9.40	\$14.53	\$0.00	\$63.95
	06/01/2026	\$41.32	\$9.40	\$14.53	\$0.00	\$65.25
	12/01/2026	\$42.61	\$9.40	\$14.53	\$0.00	\$66.54
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.86	\$13.58	\$15.10	\$0.00	\$67.54
	12/01/2023	\$39.81	\$13.58	\$15.10	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$38.33	\$13.58	\$15.10	\$0.00	\$67.01
	12/01/2023	\$39.28	\$13.58	\$15.10	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2020	\$22.44	\$11.07	\$6.50	\$0.00	\$40.01
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
	12/01/2023	\$34.38	\$9.00	\$16.59	\$0.00	\$59.97
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$37.72	\$13.58	\$15.10	\$0.00	\$66.40
	12/01/2023	\$38.67	\$13.58	\$15.10	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i>	07/01/2022	\$38.16	\$10.35	\$17.25	\$0.00	\$65.76
	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofers Waterproofing &Roofers Dampproofg) <i>ROOFERS LOCAL 248</i>	07/01/2022	\$37.66	\$10.35	\$16.75	\$0.00	\$64.76
	07/16/2023	\$38.41	\$10.35	\$18.00	\$0.00	\$66.76

Apprentice - ROOFER - Local 248

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.60	\$10.35	\$0.00	\$0.00	\$32.95
2	65	\$24.48	\$10.35	\$16.75	\$0.00	\$51.58
3	70	\$26.36	\$10.35	\$16.75	\$0.00	\$53.46
4	75	\$28.25	\$10.35	\$16.75	\$0.00	\$55.35
5	80	\$30.13	\$10.35	\$16.75	\$0.00	\$57.23
6	85	\$32.01	\$10.35	\$16.75	\$0.00	\$59.11
7	90	\$33.89	\$10.35	\$16.75	\$0.00	\$60.99
8	95	\$35.78	\$10.35	\$16.75	\$0.00	\$62.88

Effective Date - 07/16/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.05	\$10.35	\$0.00	\$0.00	\$33.40
2	65	\$24.97	\$10.35	\$18.00	\$0.00	\$53.32
3	70	\$26.89	\$10.35	\$18.00	\$0.00	\$55.24
4	75	\$28.81	\$10.35	\$18.00	\$0.00	\$57.16
5	80	\$30.73	\$10.35	\$18.00	\$0.00	\$59.08
6	85	\$32.65	\$10.35	\$18.00	\$0.00	\$61.00
7	90	\$34.57	\$10.35	\$18.00	\$0.00	\$62.92
8	95	\$36.49	\$10.35	\$18.00	\$0.00	\$64.84

Notes:

Steps are 750 hrs.Roofer(Tear Off)1:1; Same as above

Apprentice to Journeyworker Ratio:1:3

ROOFER SLATE / TILE / PRECAST CONCRETE	07/01/2022	\$38.16	\$10.35	\$17.25	\$0.00	\$65.76
ROOFERS LOCAL 248	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
For apprentice rates see "Apprentice- ROOFER"						
SCRAPER	06/01/2023	\$38.33	\$13.58	\$15.10	\$0.00	\$67.01
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.28	\$13.58	\$15.10	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS)	06/01/2023	\$37.72	\$13.58	\$15.10	\$0.00	\$66.40
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$38.67	\$13.58	\$15.10	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM	06/01/2023	\$35.10	\$13.58	\$15.10	\$0.00	\$63.78
OPERATING ENGINEERS LOCAL 98	12/01/2023	\$36.05	\$13.58	\$15.10	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SHEETMETAL WORKER	01/01/2023	\$41.30	\$10.64	\$17.54	\$2.05	\$71.53
SHEETMETAL WORKERS LOCAL 63	07/01/2023	\$42.55	\$10.64	\$17.54	\$2.05	\$72.78
	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53

Apprentice - SHEET METAL WORKER - Local 63**Effective Date - 01/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.59	\$4.79	\$4.76	\$0.92	\$29.06
2	50	\$20.65	\$5.32	\$5.29	\$1.03	\$32.29
3	55	\$22.72	\$5.85	\$5.82	\$1.13	\$35.52
4	60	\$24.78	\$6.38	\$6.35	\$1.23	\$38.74
5	65	\$26.85	\$6.92	\$6.88	\$1.33	\$41.98
6	70	\$28.91	\$7.45	\$7.41	\$1.44	\$45.21
7	75	\$30.98	\$7.98	\$7.94	\$1.54	\$48.44
8	80	\$33.04	\$8.51	\$15.42	\$1.64	\$58.61
9	85	\$35.11	\$9.04	\$15.95	\$1.74	\$61.84
10	90	\$37.17	\$9.58	\$16.48	\$1.85	\$65.08

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.15	\$4.79	\$4.76	\$0.92	\$29.62
2	50	\$21.28	\$5.32	\$5.29	\$1.03	\$32.92
3	55	\$23.40	\$5.85	\$5.82	\$1.13	\$36.20
4	60	\$25.53	\$6.38	\$6.35	\$1.23	\$39.49
5	65	\$27.66	\$6.92	\$6.88	\$1.33	\$42.79
6	70	\$29.79	\$7.45	\$7.41	\$1.44	\$46.09
7	75	\$31.91	\$7.98	\$7.94	\$1.54	\$49.37
8	80	\$34.04	\$8.51	\$15.42	\$1.64	\$59.61
9	85	\$36.17	\$9.04	\$15.95	\$1.74	\$62.90
10	90	\$38.30	\$9.58	\$16.48	\$1.85	\$66.21

Notes:**Apprentice to Journeyworker Ratio:1:3**

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 669	04/01/2021	\$43.14	\$10.55	\$16.41	\$0.00	\$70.10

Apprentice - *SPRINKLER FITTER - Local 669*

Effective Date - 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.41	\$7.75	\$0.00	\$0.00	\$27.16
2	50	\$21.57	\$7.75	\$0.00	\$0.00	\$29.32
3	55	\$23.73	\$10.55	\$8.15	\$0.00	\$42.43
4	60	\$25.88	\$10.55	\$8.15	\$0.00	\$44.58
5	65	\$28.04	\$10.55	\$8.40	\$0.00	\$46.99
6	70	\$30.20	\$10.55	\$8.40	\$0.00	\$49.15
7	75	\$32.36	\$10.55	\$8.40	\$0.00	\$51.31
8	80	\$34.51	\$10.55	\$8.40	\$0.00	\$53.46
9	85	\$36.67	\$10.55	\$8.40	\$0.00	\$55.62
10	90	\$38.83	\$10.55	\$8.40	\$0.00	\$57.78

Notes:

Apprentice to Journeyworker Ratio:1:1

TELECOMMUNICATION TECHNICIAN	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
<i>ELECTRICIANS LOCAL 7</i>						

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 7*

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.80	\$7.35	\$0.56	\$0.00	\$26.71
2	45	\$21.15	\$7.35	\$0.63	\$0.00	\$29.13
3	50	\$23.51	\$12.25	\$7.20	\$0.00	\$42.96
4	55	\$25.86	\$12.25	\$7.27	\$0.00	\$45.38
5	65	\$30.56	\$12.25	\$9.14	\$0.00	\$51.95
6	70	\$32.91	\$12.25	\$10.37	\$0.00	\$55.53

Notes:

Steps are 800 hours

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS	02/01/2023	\$59.29	\$11.49	\$22.34	\$0.00	\$93.12
<i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE</i>						
	08/01/2023	\$61.34	\$11.49	\$22.34	\$0.00	\$95.17
	02/01/2024	\$62.59	\$11.49	\$22.34	\$0.00	\$96.42
	08/01/2024	\$64.69	\$11.49	\$22.34	\$0.00	\$98.52
	02/01/2025	\$65.99	\$11.49	\$22.34	\$0.00	\$99.82
	08/01/2025	\$68.14	\$11.49	\$22.34	\$0.00	\$101.97
	02/10/2026	\$69.49	\$11.49	\$22.34	\$0.00	\$103.32
	08/01/2026	\$71.69	\$11.49	\$22.34	\$0.00	\$105.52
	02/01/2027	\$73.09	\$11.49	\$22.34	\$0.00	\$106.92

Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)**Effective Date -** 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.65	\$11.49	\$22.34	\$0.00	\$63.48
2	60	\$35.57	\$11.49	\$22.34	\$0.00	\$69.40
3	70	\$41.50	\$11.49	\$22.34	\$0.00	\$75.33
4	80	\$47.43	\$11.49	\$22.34	\$0.00	\$81.26
5	90	\$53.36	\$11.49	\$22.34	\$0.00	\$87.19

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.67	\$11.49	\$22.34	\$0.00	\$64.50
2	60	\$36.80	\$11.49	\$22.34	\$0.00	\$70.63
3	70	\$42.94	\$11.49	\$22.34	\$0.00	\$76.77
4	80	\$49.07	\$11.49	\$22.34	\$0.00	\$82.90
5	90	\$55.21	\$11.49	\$22.34	\$0.00	\$89.04

Notes:**Apprentice to Journeyworker Ratio:1:5**

TERRAZZO MECHANIC

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

02/01/2023	\$60.37	\$11.49	\$22.31	\$0.00	\$94.17
08/01/2023	\$62.42	\$11.49	\$22.31	\$0.00	\$96.22
02/01/2024	\$63.67	\$11.49	\$22.31	\$0.00	\$97.47
08/01/2024	\$65.77	\$11.49	\$22.31	\$0.00	\$99.57
02/01/2025	\$67.07	\$11.49	\$22.31	\$0.00	\$100.87
08/01/2025	\$69.22	\$11.49	\$22.31	\$0.00	\$103.02
02/01/2026	\$70.57	\$11.49	\$22.31	\$0.00	\$104.37
08/01/2026	\$72.77	\$11.49	\$22.31	\$0.00	\$106.57
02/01/2027	\$74.17	\$11.49	\$22.31	\$0.00	\$107.97

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.19	\$11.49	\$22.31	\$0.00	\$63.99
2	60	\$36.22	\$11.49	\$22.31	\$0.00	\$70.02
3	70	\$42.26	\$11.49	\$22.31	\$0.00	\$76.06
4	80	\$48.30	\$11.49	\$22.31	\$0.00	\$82.10
5	90	\$54.33	\$11.49	\$22.31	\$0.00	\$88.13

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.21	\$11.49	\$22.31	\$0.00	\$65.01
2	60	\$37.45	\$11.49	\$22.31	\$0.00	\$71.25
3	70	\$43.69	\$11.49	\$22.31	\$0.00	\$77.49
4	80	\$49.94	\$11.49	\$22.31	\$0.00	\$83.74
5	90	\$56.18	\$11.49	\$22.31	\$0.00	\$89.98

Notes:

Apprentice to Journeyworker Ratio:1:5

TEST BORING DRILLER	06/01/2023	\$47.58	\$9.40	\$17.97	\$0.00	\$74.95
LABORERS - FOUNDATION AND MARINE	12/01/2023	\$48.83	\$9.40	\$17.97	\$0.00	\$76.20
	06/01/2024	\$50.31	\$9.40	\$17.97	\$0.00	\$77.68
	12/01/2024	\$51.78	\$9.40	\$17.97	\$0.00	\$79.15
	06/01/2025	\$53.28	\$9.40	\$17.97	\$0.00	\$80.65
	12/01/2025	\$54.78	\$9.40	\$17.97	\$0.00	\$82.15
	06/01/2026	\$56.33	\$9.40	\$17.97	\$0.00	\$83.70
	12/01/2026	\$57.83	\$9.40	\$17.97	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER	06/01/2023	\$43.70	\$9.40	\$17.97	\$0.00	\$71.07
LABORERS - FOUNDATION AND MARINE	12/01/2023	\$44.95	\$9.40	\$17.97	\$0.00	\$72.32
	06/01/2024	\$46.43	\$9.40	\$17.97	\$0.00	\$73.80
	12/01/2024	\$47.90	\$9.40	\$17.97	\$0.00	\$75.27
	06/01/2025	\$49.40	\$9.40	\$17.97	\$0.00	\$76.77
	12/01/2025	\$50.90	\$9.40	\$17.97	\$0.00	\$78.27
	06/01/2026	\$52.45	\$9.40	\$17.97	\$0.00	\$79.82
	12/01/2026	\$53.95	\$9.40	\$17.97	\$0.00	\$81.32

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$43.58	\$9.40	\$17.97	\$0.00	\$70.95
	12/01/2023	\$44.83	\$9.40	\$17.97	\$0.00	\$72.20
	06/01/2024	\$46.31	\$9.40	\$17.97	\$0.00	\$73.68
	12/01/2024	\$47.78	\$9.40	\$17.97	\$0.00	\$75.15
	06/01/2025	\$49.28	\$9.40	\$17.97	\$0.00	\$76.65
	12/01/2025	\$50.78	\$9.40	\$17.97	\$0.00	\$78.15
	06/01/2026	\$52.33	\$9.40	\$17.97	\$0.00	\$79.70
	12/01/2026	\$53.83	\$9.40	\$17.97	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2023	\$37.72	\$13.58	\$15.10	\$0.00	\$66.40
	12/01/2023	\$38.67	\$13.58	\$15.10	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2023	\$55.81	\$9.40	\$18.42	\$0.00	\$83.63
	12/01/2023	\$57.06	\$9.40	\$18.42	\$0.00	\$84.88
	06/01/2024	\$58.54	\$9.40	\$18.42	\$0.00	\$86.36
	12/01/2024	\$60.01	\$9.40	\$18.42	\$0.00	\$87.83
	06/01/2025	\$61.51	\$9.40	\$18.42	\$0.00	\$89.33
	12/01/2025	\$63.01	\$9.40	\$18.42	\$0.00	\$90.83
	06/01/2026	\$64.56	\$9.40	\$18.42	\$0.00	\$92.38
	12/01/2026	\$66.06	\$9.40	\$18.42	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2023	\$57.81	\$9.40	\$18.42	\$0.00	\$85.63
	12/01/2023	\$59.06	\$9.40	\$18.42	\$0.00	\$86.88
	06/01/2024	\$60.54	\$9.40	\$18.42	\$0.00	\$88.36
	12/01/2024	\$62.01	\$9.40	\$18.42	\$0.00	\$89.83
	06/01/2025	\$63.51	\$9.40	\$18.42	\$0.00	\$91.33
	12/01/2025	\$65.01	\$9.40	\$18.42	\$0.00	\$92.83
	06/01/2026	\$66.56	\$9.40	\$18.42	\$0.00	\$94.38
	12/01/2026	\$68.06	\$9.40	\$18.42	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2023	\$47.88	\$9.40	\$18.42	\$0.00	\$75.70
	12/01/2023	\$49.13	\$9.40	\$18.42	\$0.00	\$76.95
	06/01/2024	\$50.61	\$9.40	\$18.42	\$0.00	\$78.43
	12/01/2024	\$52.08	\$9.40	\$18.42	\$0.00	\$79.90
	06/01/2025	\$53.58	\$9.40	\$18.42	\$0.00	\$81.40
	12/01/2025	\$55.08	\$9.40	\$18.42	\$0.00	\$82.90
	06/01/2026	\$56.63	\$9.40	\$18.42	\$0.00	\$84.45
	12/01/2026	\$58.13	\$9.40	\$18.42	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2023	\$49.88	\$9.40	\$18.42	\$0.00	\$77.70
	12/01/2023	\$51.13	\$9.40	\$18.42	\$0.00	\$78.95
	06/01/2024	\$52.61	\$9.40	\$18.42	\$0.00	\$80.43
	12/01/2024	\$54.08	\$9.40	\$18.42	\$0.00	\$81.90
	06/01/2025	\$55.58	\$9.40	\$18.42	\$0.00	\$83.40
	12/01/2025	\$57.08	\$9.40	\$18.42	\$0.00	\$84.90
	06/01/2026	\$58.63	\$9.40	\$18.42	\$0.00	\$86.45
	12/01/2026	\$60.13	\$9.40	\$18.42	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
WAGON DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2023	\$33.75	\$9.40	\$16.59	\$0.00	\$59.74
	12/01/2023	\$34.38	\$9.40	\$16.59	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	06/01/2023	\$33.75	\$9.40	\$14.53	\$0.00	\$57.68
	12/01/2023	\$34.38	\$9.40	\$14.53	\$0.00	\$58.31
	06/01/2024	\$35.58	\$9.40	\$14.53	\$0.00	\$59.51
	12/01/2024	\$36.78	\$9.40	\$14.53	\$0.00	\$60.71
	06/01/2025	\$38.03	\$9.40	\$14.53	\$0.00	\$61.96
	12/01/2025	\$39.27	\$9.40	\$14.53	\$0.00	\$63.20
	06/01/2026	\$40.57	\$9.40	\$14.53	\$0.00	\$64.50
	12/01/2026	\$41.86	\$9.40	\$14.53	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WATER METER INSTALLER <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Additional Apprentices Information:

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

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

All steps are six months (1000 hours.)

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

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

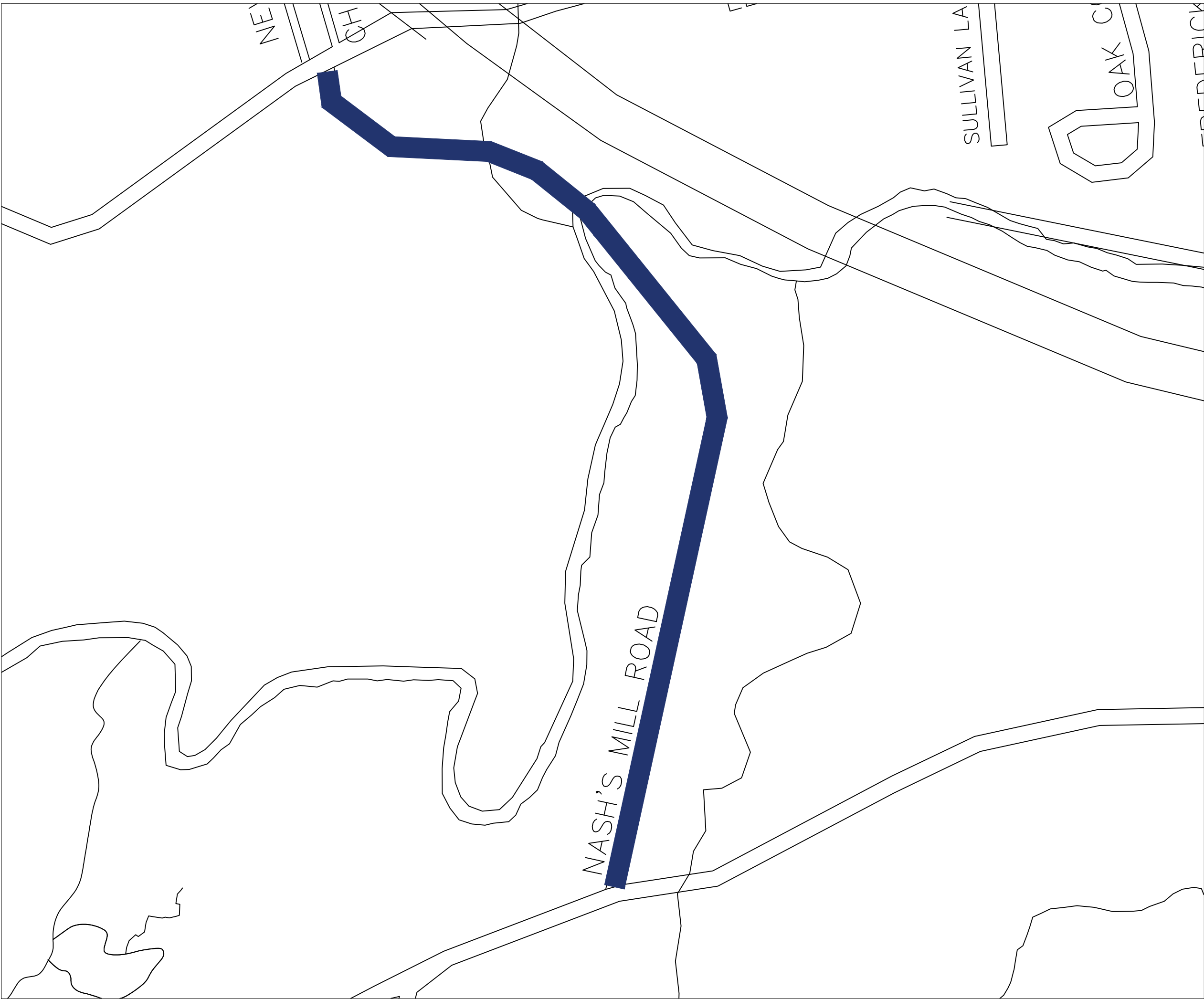
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

APPENDIX B
CONTRACT DRAWINGS

NASH'S MILL ROAD 12" WATER MAIN INSTALLATION

GREENFIELD, MA

SHEET	DRAWING
G1	COVER
C1 - C6	DESIGN
D1 - D2	DETAILS



LOCUS N.T.S.

DPW CONTRACT#: DPW 24-01

MAYOR
ROXANN WEDEGARTNER

DIRECTOR OF PUBLIC WORKS
MARLO WARNER

ENGINEERING SUPERINTENDENT
ALAN TWAROG



**Greenfield Department of
Public Works
Engineering**

189 Wells Street
Greenfield, MA 01301
Phone:(413)772-1528

DATE					
COMMENTS					
REV. #					

NASH'S MILL ROAD 12" WATER MAIN INSTALLATION

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G1

Designed by:	SL	Date:	4/18/2023	SHEET: 1 OF 9
Drawn by:	SL			
Checked by:	AT			

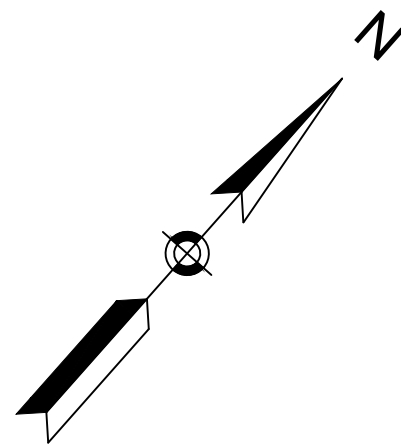
- PROPOSED WATER MAIN
- DRAIN PIPE
- SEWER PIPE
- EXISTING WATER LINE
- CATCH BASIN
- GUARD RAIL
- SEWER MANHOLE
- DRAIN MANHOLE



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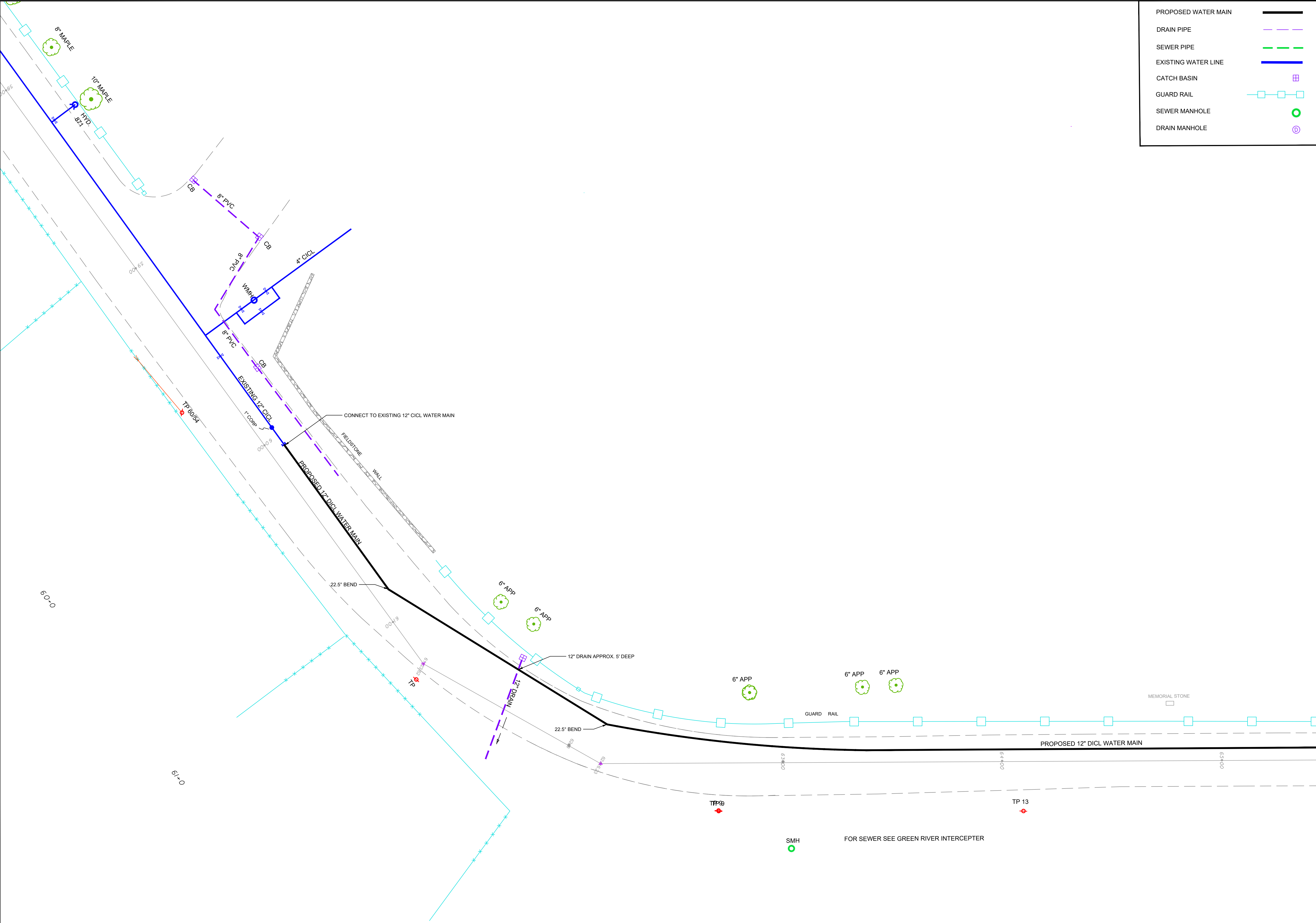
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NASH'S MILL ROAD
12" WATER MAIN
INSTALLATION

C1

Designed by: SL	Date: 4/18/2023	SHEET: 2 OF 9
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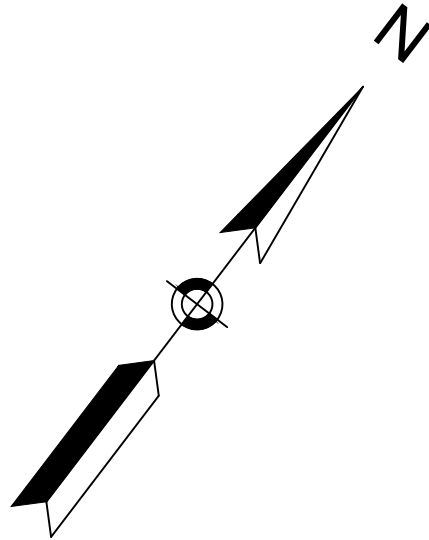
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DRAIN PIPE	
SEWER PIPE	
EXISTING WATER LINE	
CATCH BASIN	
GUARD RAIL	
SEWER MANHOLE	
DRAIN MANHOLE	



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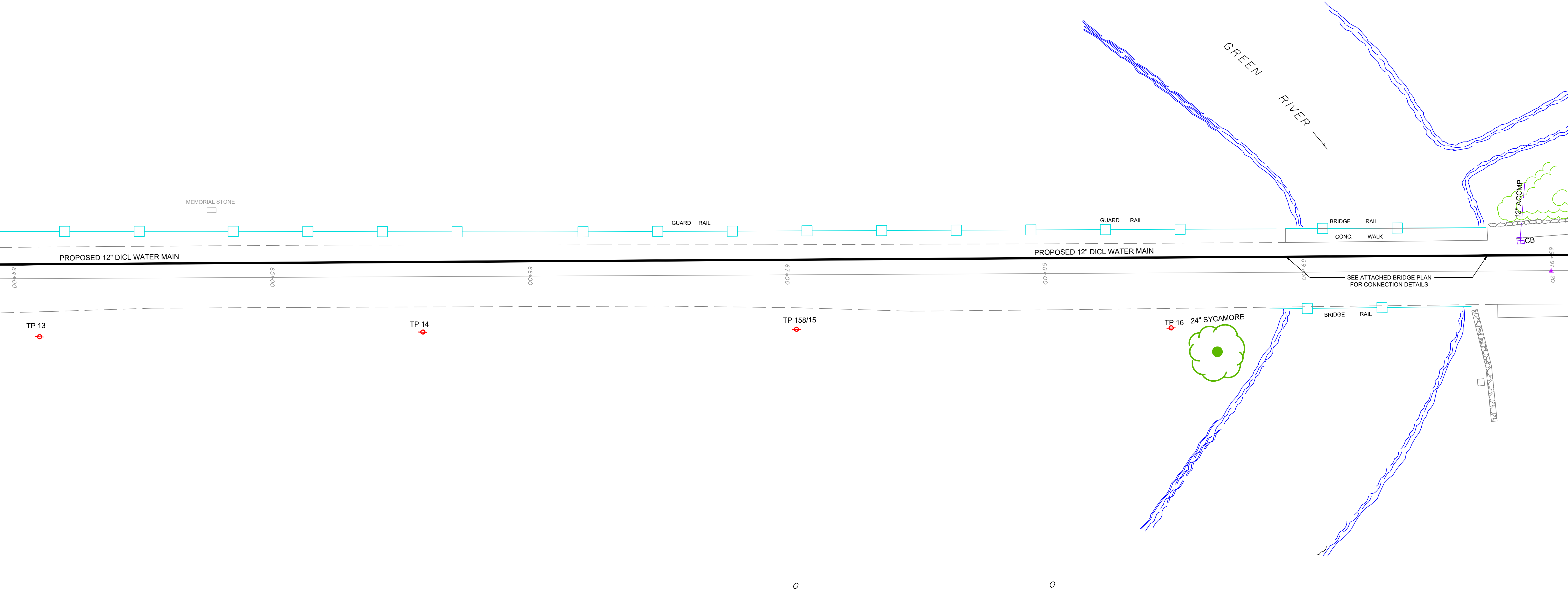
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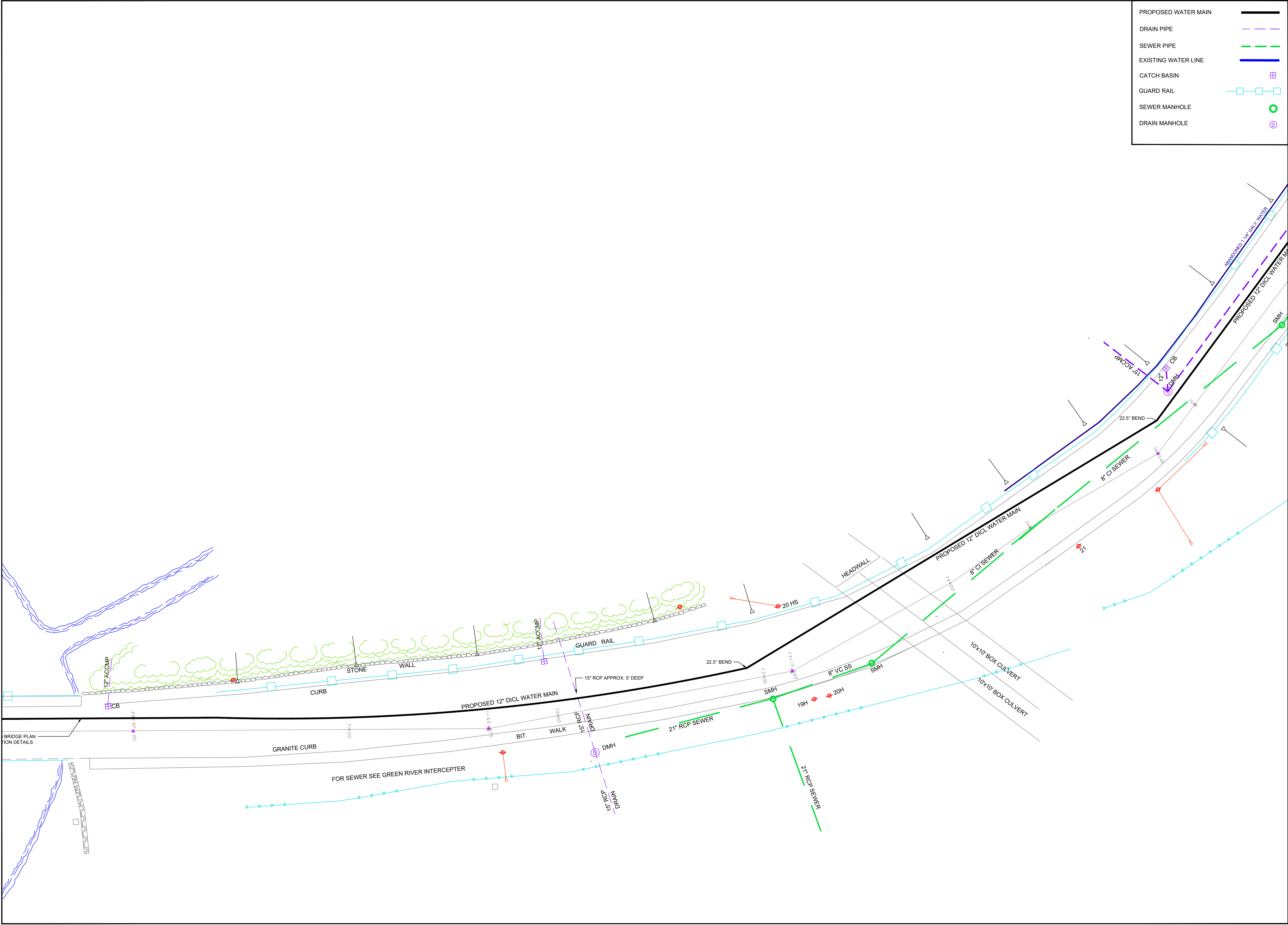
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NASH'S MILL ROAD
12" WATER MAIN
INSTALLATION

C2

Designed by:	SL	Date:	4/18/2023	SHEET: 3 OF 9
Drawn by:	SL			
Checked by:	AT			

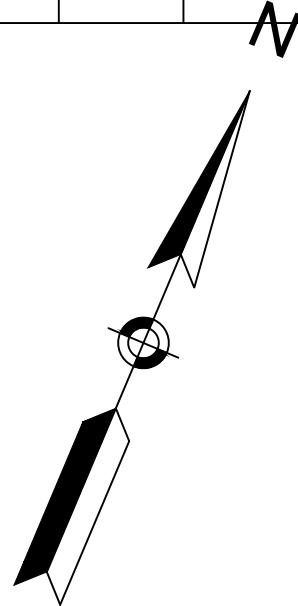




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REV. #					



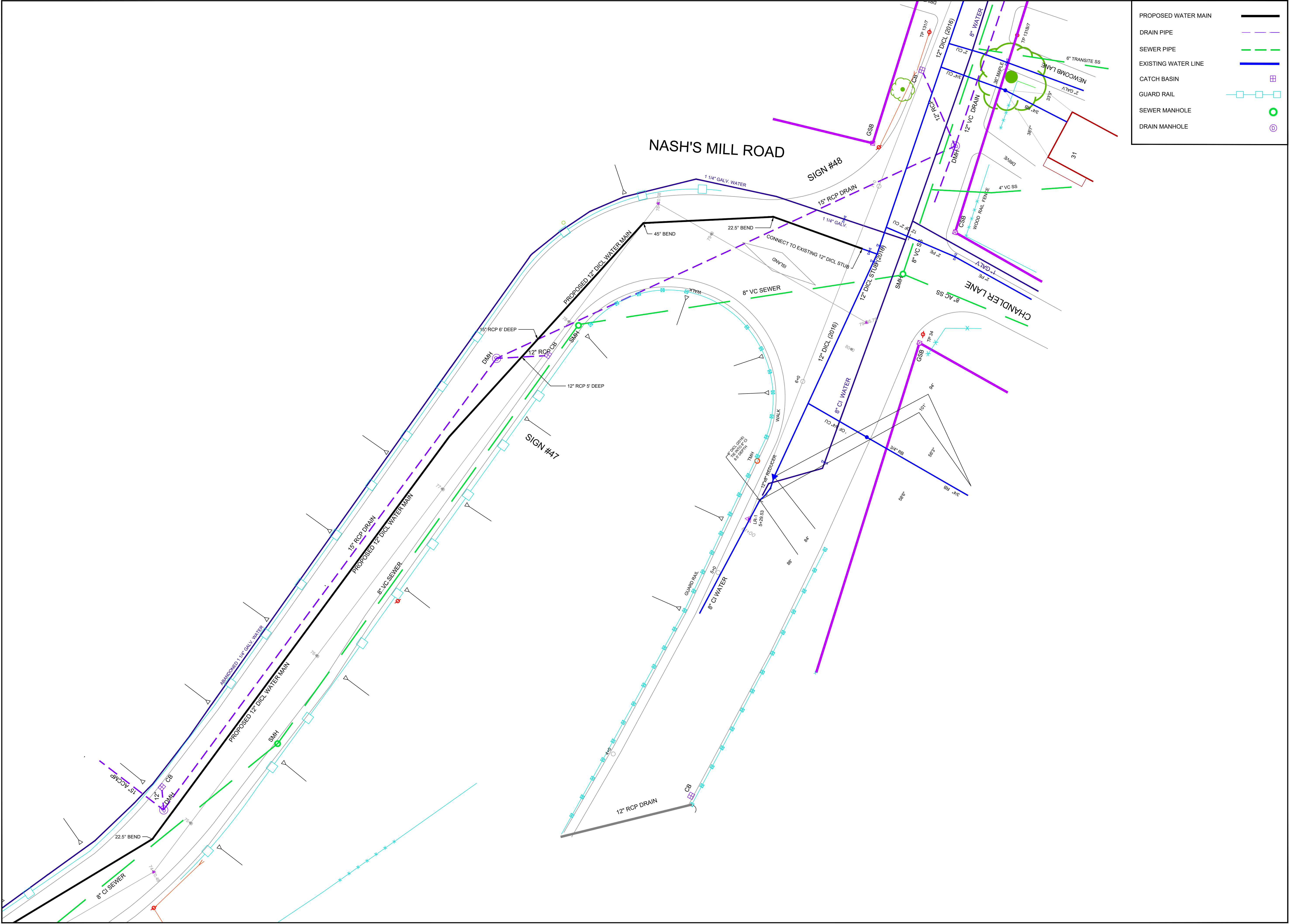
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**NASH'S MILL ROAD
12" WATER MAIN
INSTALLATION**

C3

Designed by: SL	Date: 4/18/2023	SHEET: 4 OF 9
Drawn by: SL		
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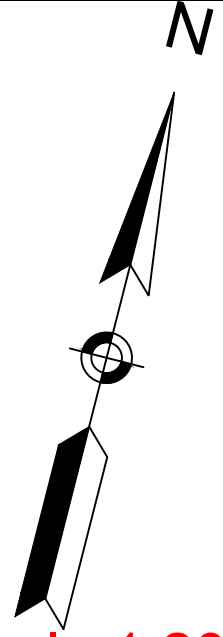
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DRAIN PIPE	
SEWER PIPE	
EXISTING WATER LINE	
CATCH BASIN	
GUARD RAIL	
SEWER MANHOLE	
DRAIN MANHOLE	



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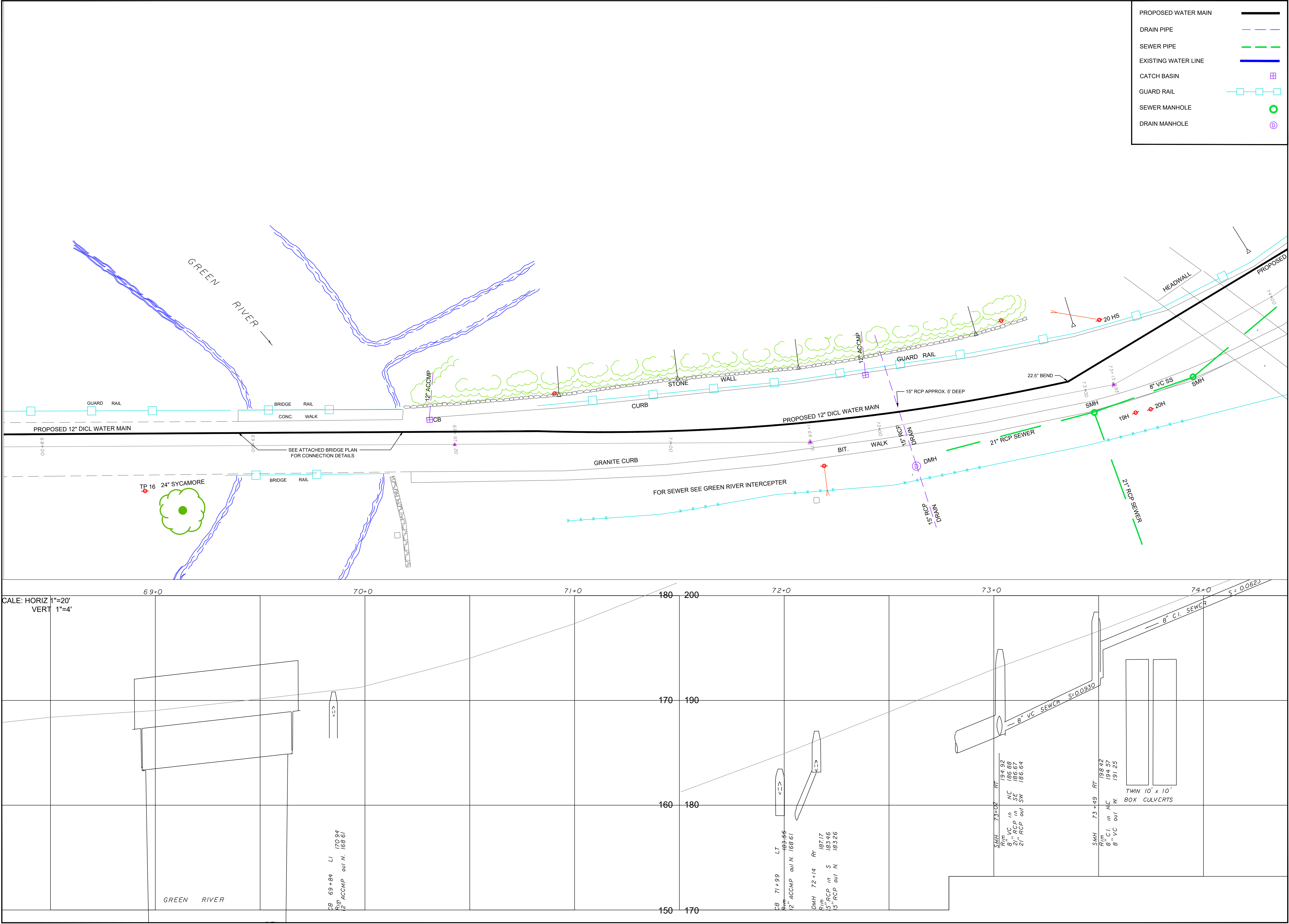
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**NASH'S MILL ROAD
12" WATER MAIN
INSTALLATION**

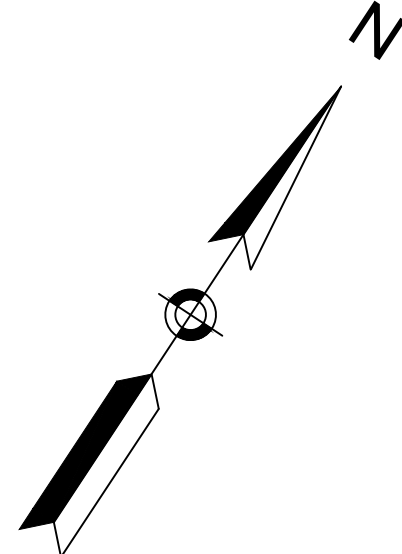
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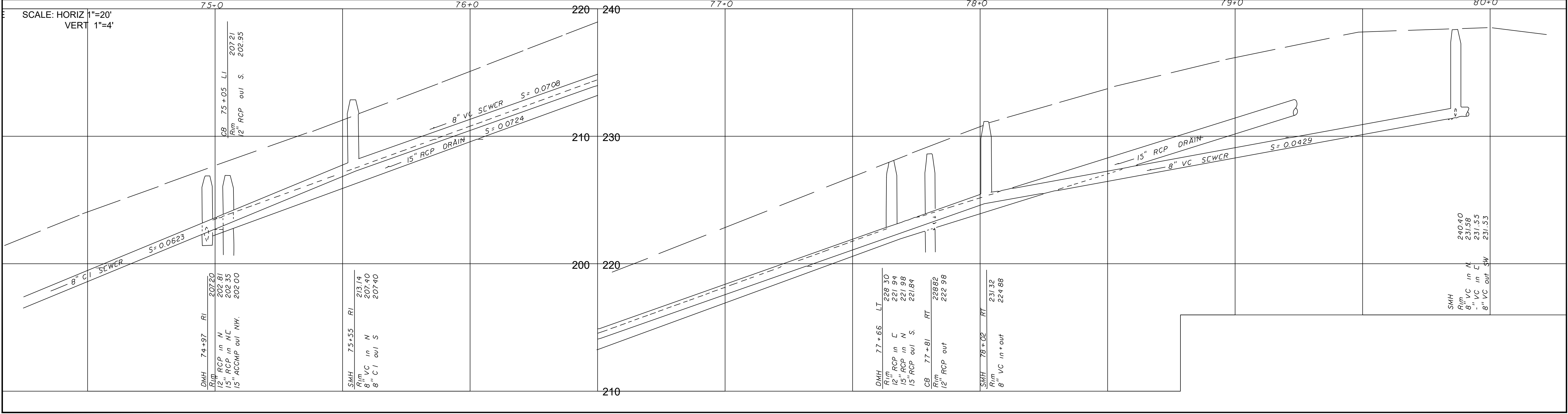
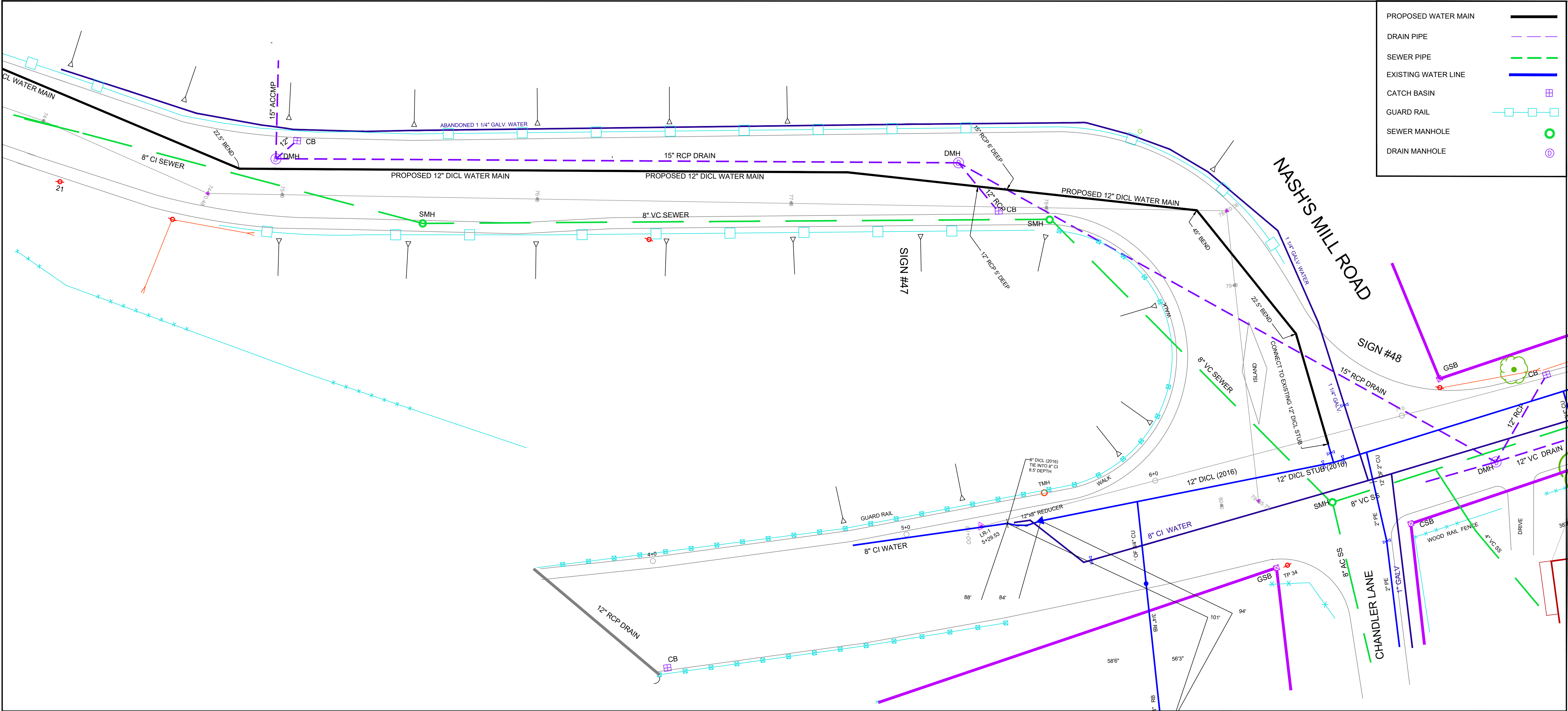
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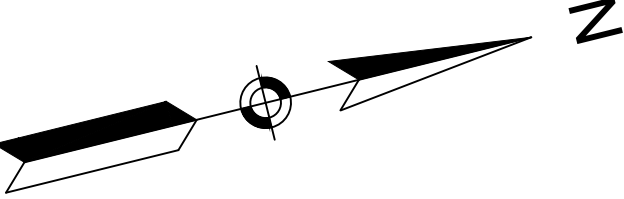
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NASH'S MILL ROAD 12" WATER MAIN INSTALLATION					
C5					
Designed by: SL		Date: 4/18/2023		SHEET: 6 OF 9	
Drawn by: SL					
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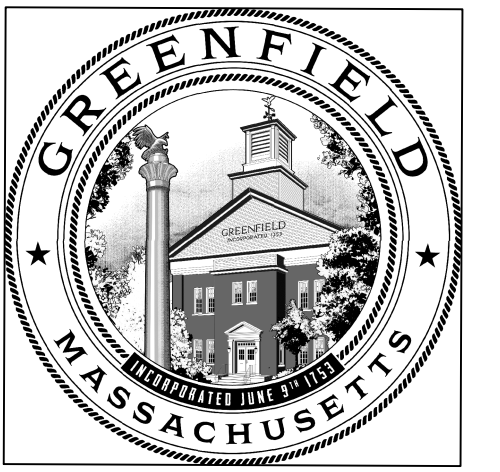
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NASH'S MILL ROAD
12" WATER MAIN
INSTALLATION

C6

Designed by: SL	Date: 4/18/2023	SHEET: 7 OF 9
Drawn by: SL		
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MAINLINE



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NASH'S MILL ROAD 12" WATER MAIN INSTALLATION

D1

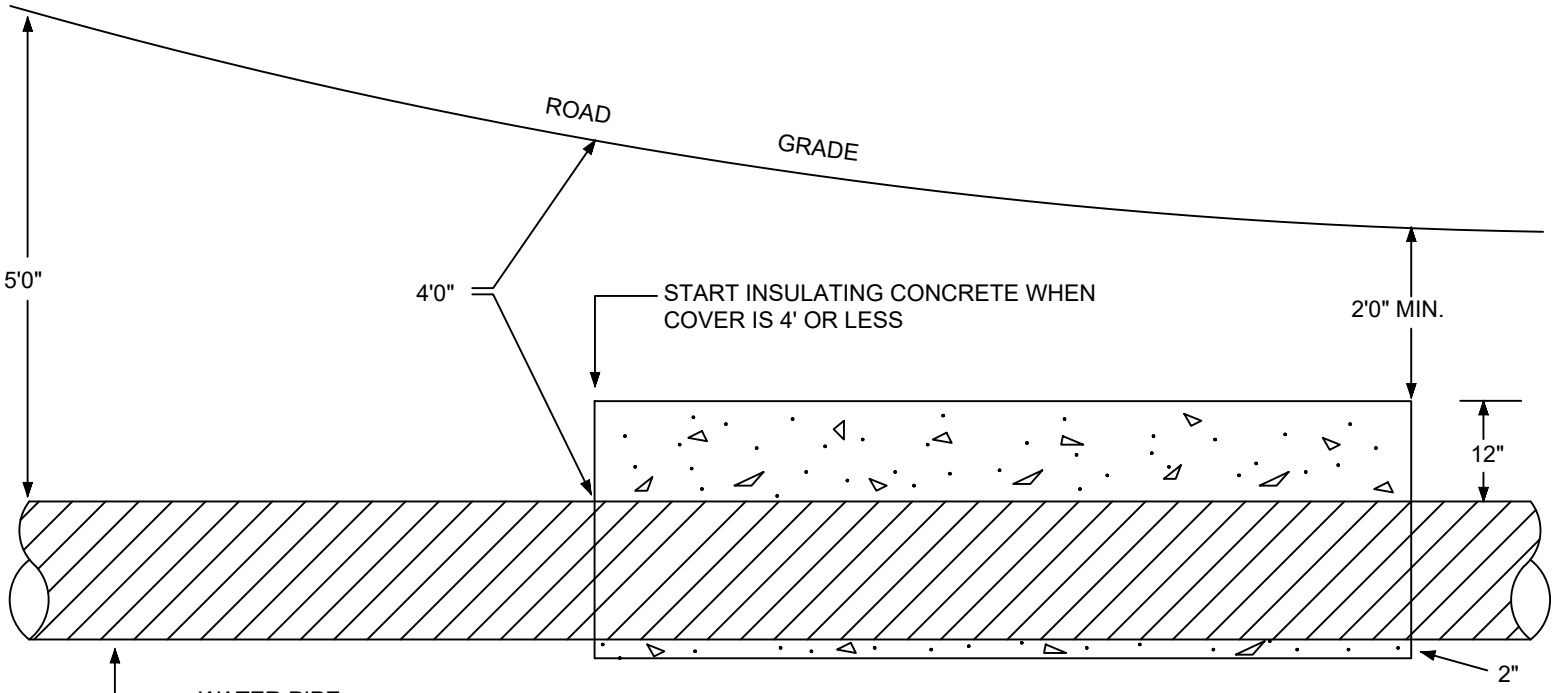
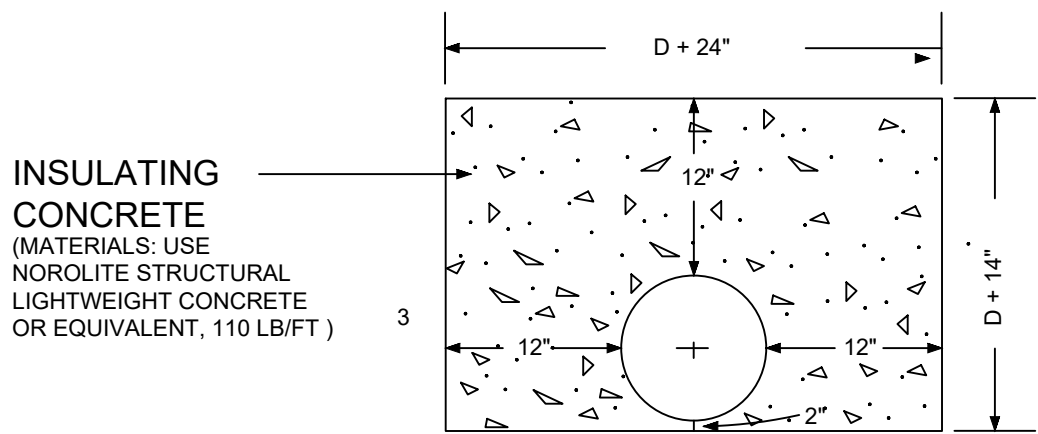
Designed by:	SL	Date:	4/18/2023	SHEET: 8 OF 9
Drawn by:	SL			
Checked by:	AT			

Greenfield Department of Public Works

July 1997
By: S.J. Roberts
W-GATEBOX.dwg

Greenfield Department of Public Works

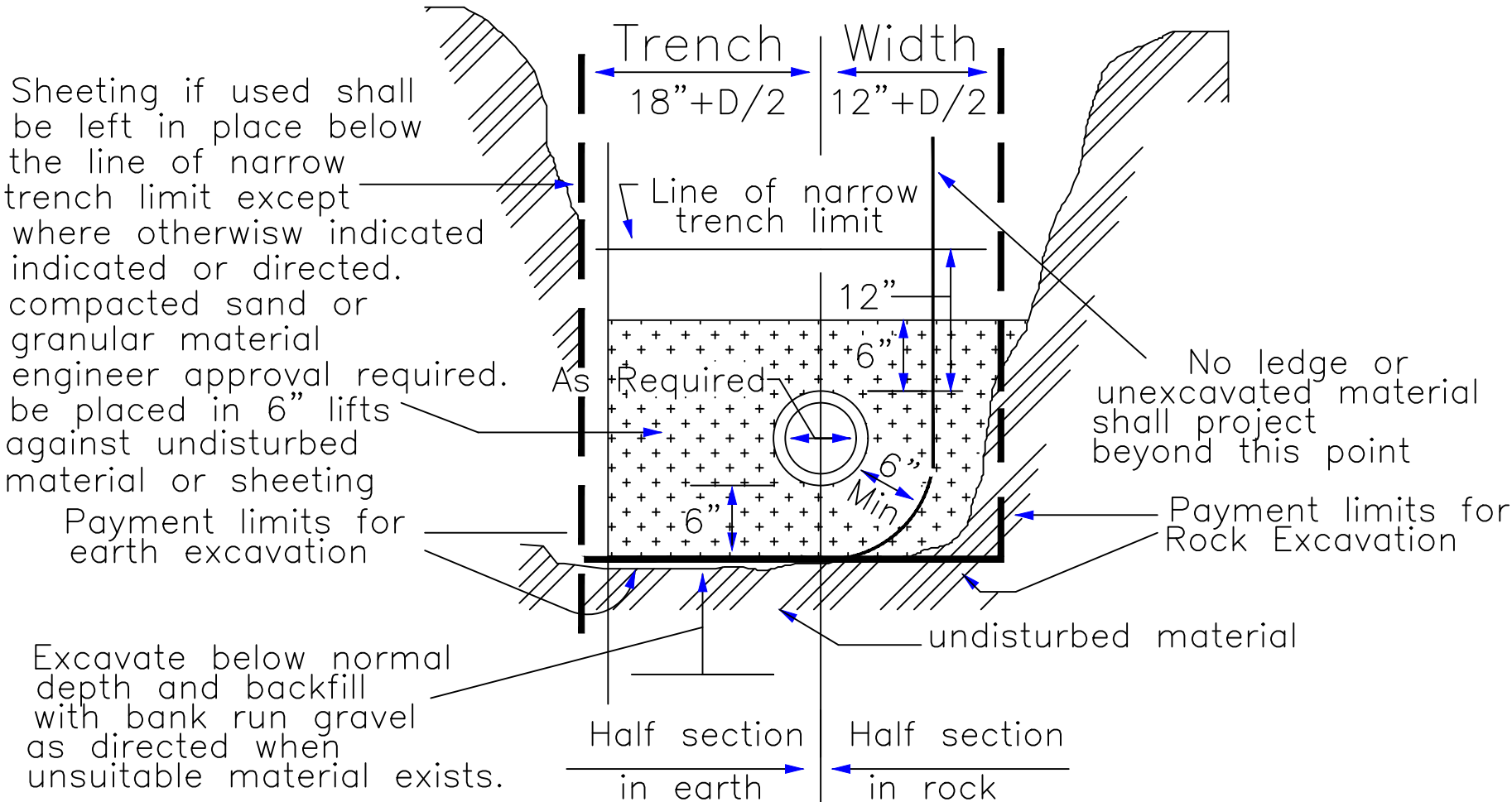
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By: S.J. Roberts
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WATER MAIN DETAILS INSULATION OF PIPES WITH LESS THAN 40" OF COVER

WATER PIPE TRENCH SECTION

TRENCH MAY BE EXCAVATED WIDER THAN PAYMENT LIMITS
ABOVE THE "LINE OF NARROW TRENCH LIMIT"



- Pipe shall be Class 52 Ductile Iron Pipe as approved by the Greenfield Department of Public Works. All joints to be rubber gasket unless otherwise specified.
- Pipe shall be to proper line and grade with a minimum of five (5) feet of cover.
- All pipe not laid by the Greenfield Department of Public Works shall be inspected by the Engineering Division of said D.P.W. prior to burial.

Greenfield Department of Public Works

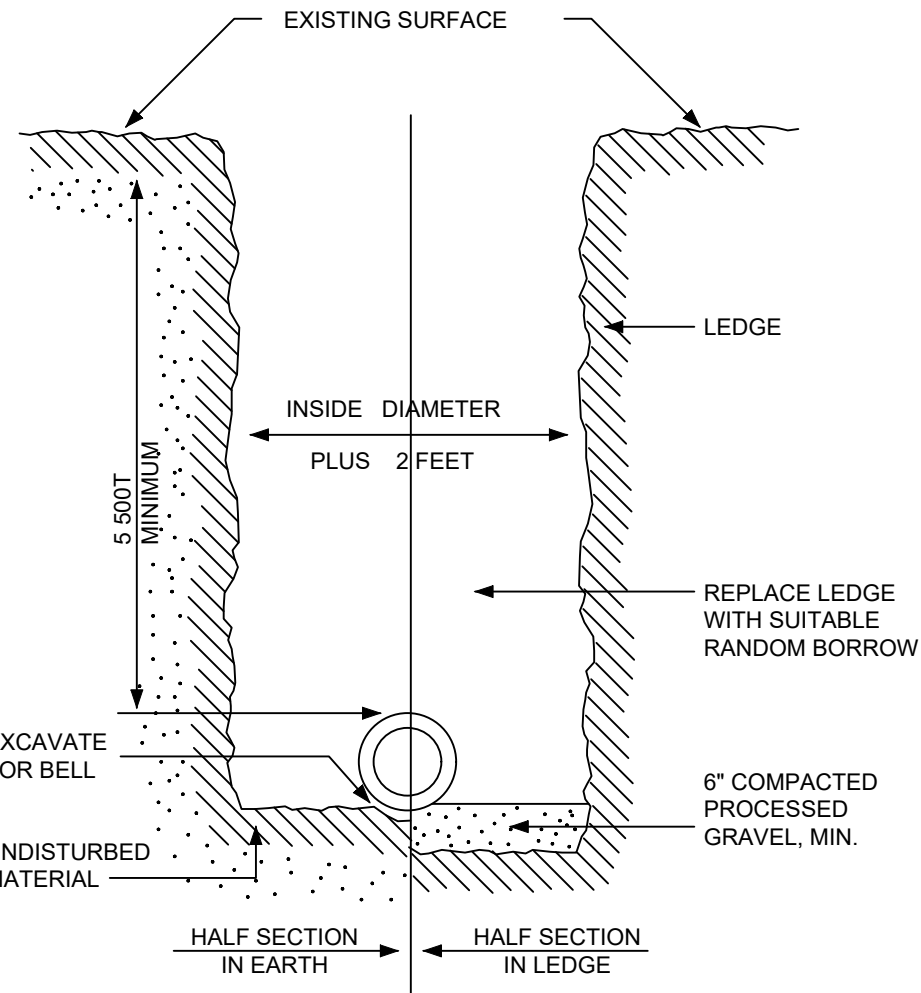
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Greenfield Department of Public Works

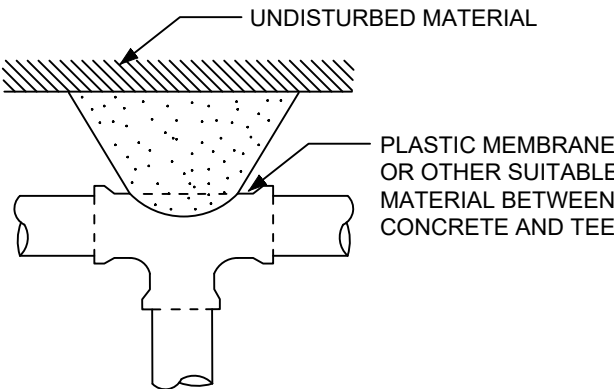
July 1997
By: S.J. Roberts
WM-INSUL.dwg

NOTES

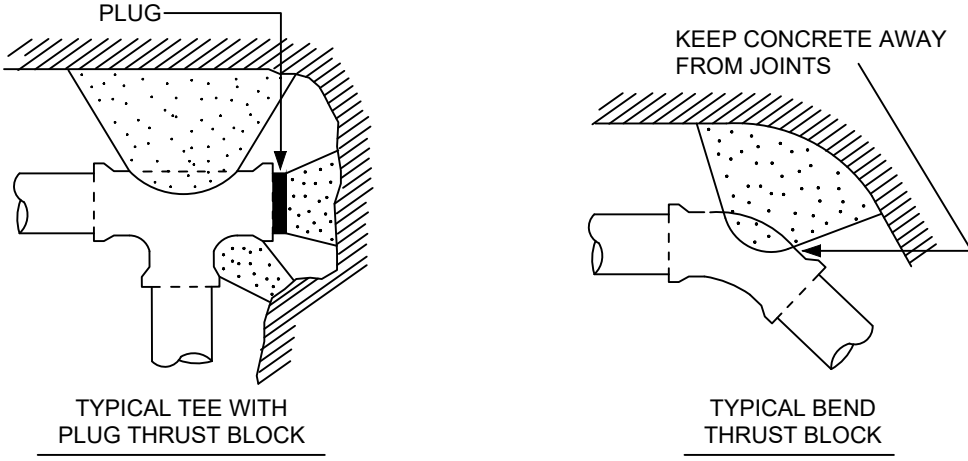
- ALL PIPELINE WORK SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR WATER MAINS
- ALL TRENCHES SHALL BE BACKFILLED BY HAND FROM THE BOTTOM OF THE TRENCH TO THE CENTER OF THE PIPE IN LAYERS OF APPROXIMATELY 3" AND THOROUGHLY TAMPED UNDER THE PIPE AND COMPACTED AROUND THE PIPE FROM THE CENTERLINE OF THE PIPE TO A DEPTH OF 1 FOOT ABOVE THE PIPE. THE TRENCH SHALL BE BACKFILLED BY HAND FROM A POINT 1 FOOT ABOVE THE PIPE TO THE SURFACE. THE TRENCH MAY BE BACKFILLED BY APPROVED MECHANICAL METHODS
- THRUST BLOCKS SHALL BE MACHINE-MIXED, POURED-IN-PLACE CONCRETE AND SHALL BE PLACED AT ALL BENDS, TEES, DEAD ENDS AND SIMILAR LOCATIONS. THRUST BLOCKS SHALL HAVE A MINIMUM HORIZONTAL THICKNESS OF 2 FEET. (4000 P.S.I. CONCRETE)



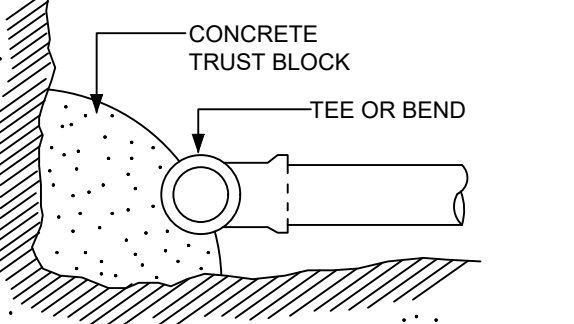
TYPICAL TRENCH SECTION FOR C.I. PIPE



TYPICAL TEE THRUST BLOCK



TYPICAL TEE WITH PLUG THRUST BLOCK



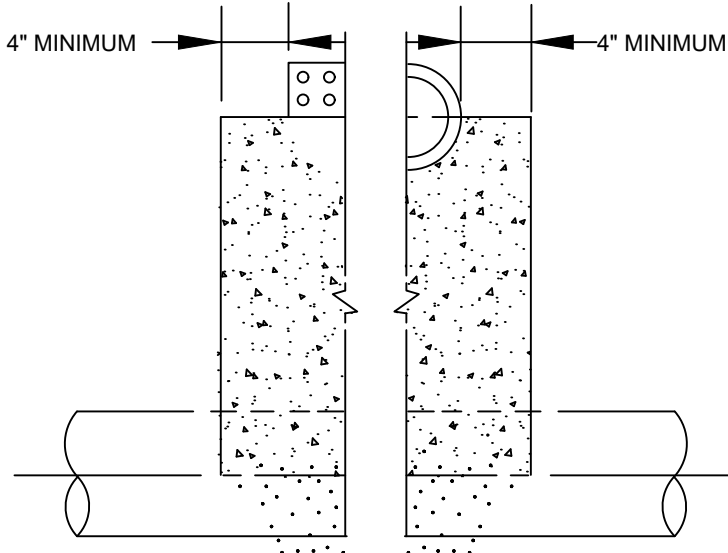
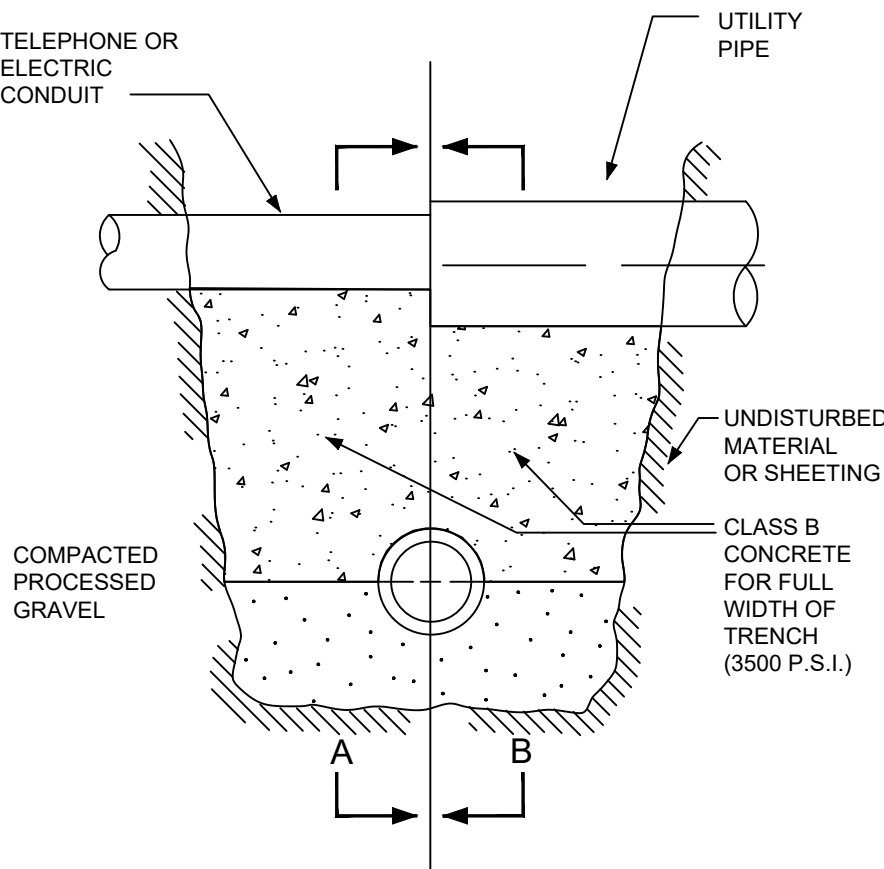
TYPICAL BEND THRUST BLOCK

TYPICAL SECTION

BEARING SURFACES MEASURED PERPENDICULAR
TO THE DIRECTION OF THRUST

20" PIPE -----36 SQ. FT. (9'x4')
16" PIPE -----36 SQ. FT. (7'x3')
12" PIPE -----36 SQ. FT. (6'x2')
8" PIPE -----36 SQ. FT. (2'x3')

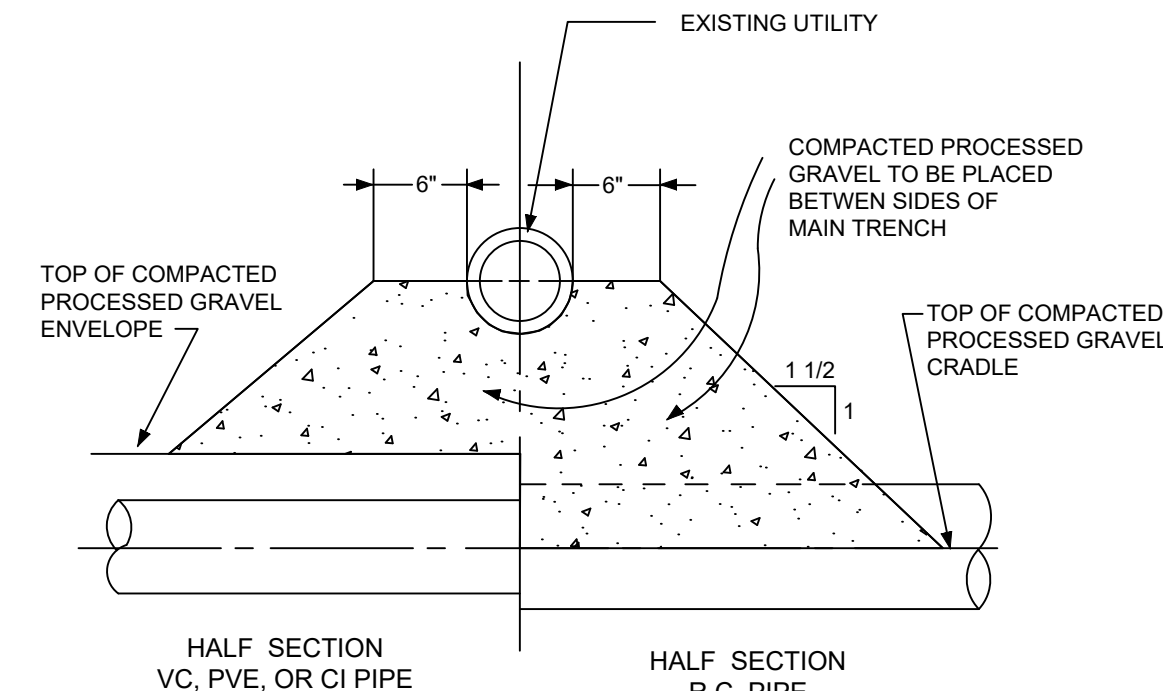
TYPE C



HALF SECTION "A"

HALF SECTION "B"

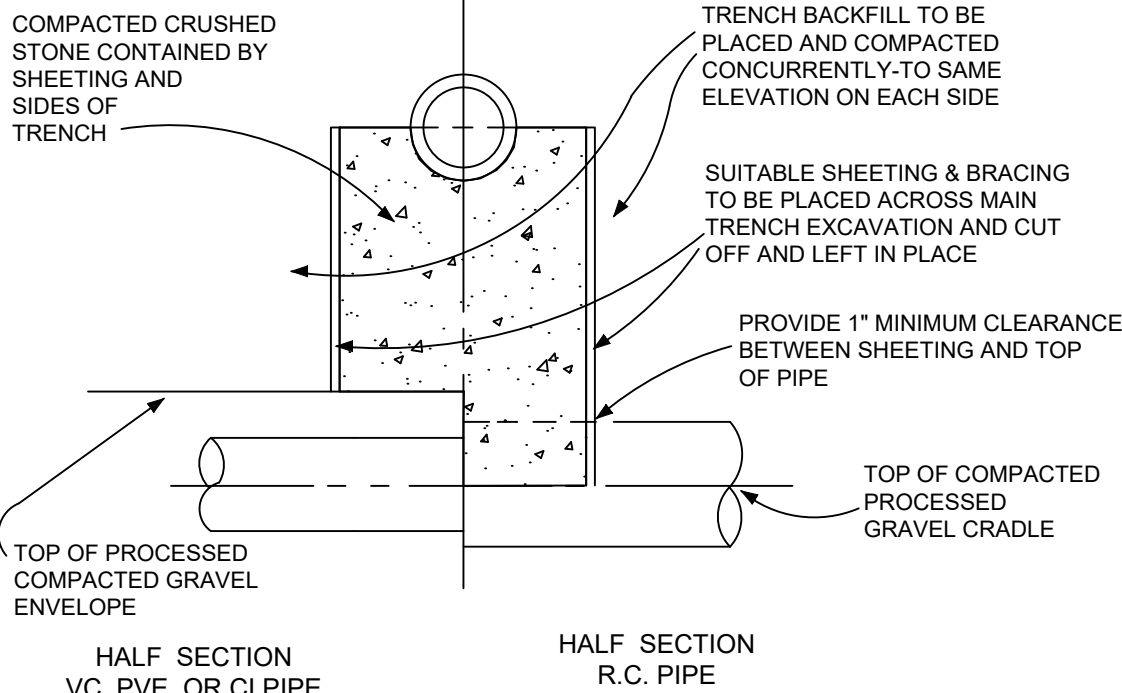
TYPE A



HALF SECTION VC, PVE, OR CI PIPE

HALF SECTION R.C. PIPE

TYPE B



HALF SECTION VC, PVE, OR CI PIPE

HALF SECTION R.C. PIPE

PIPE TRENCH DETAILS

Greenfield Department of Public Works

January 1999
By: S.J. Roberts
W-MANDT.dwg

Greenfield Department of Public Works

January 1999
By: S.J. Roberts
WPEPTR.dwg

THRUST BLOCKS

SECTION A-A

THRUST BLOCK FOR DOWNWARD RESTRAINT

THRUST BLOCK FOR UPWARD RESTRAINT

WATER MAIN DETAILS

VERTICAL THRUST BLOCK

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July 1997
By: S.J. Roberts
WTHRBLK.dwg

BLOCKING FOR 11.25° OR 22.5° VERTICAL BENDS

BLOCKING FOR 45° VERTICAL BENDS

NOTE: STEEL TIE RODS SHALL BE HEAVILY COATED WITH ASPHALT AFTER INSTALLATION.

PIPE DIAM.	TEST PRESSURE (PSI)	BEND ANGLE	CONCRETE CUBE VOLUME (Cubic-Ft)	CUBE SIZE (Ft)	TIE ROD DIAM.	TIE ROD EMBEDMENT
4"	250	11.25°	6	1.8	5/8"	17"
		22.5°	12	2.3		
		45°	22	2.8		
6"	250	11.25°	14	2.4	5/8"	17"
		22.5°	27	3.0		
		45°	50	3.7		
8"	250	11.25°	25	2.9	5/8"	17"
		22.5°	48	3.6		
		45°	89	4.5		
10"	250	11.25°	38	3.4	5/8"	17"
		22.5°	75	4.2		
		45°	139	5.2		
12"	250	11.25°	55	3.8	5/8"	17"
		22.5°	108	4.8		
		45°	200	5.8		
14"	250	11.25°	75	4.2	5/8"	17"
		22.5°	147	5.3		
		45°	272	6.5		
16"	250	11.25°	96	4.6	5/8"	17"
		22.5°	192	5.8		
		45°	355	7.1		

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July 1997
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UNBALANCED CROSS (Use column A)

PLUGGED CROSS (Use column A)

PLUGGED CROSS (Use column B)

PLUGGED TEE (Use column B)

VALVE (Use column A)

OFFSET (Use columns B - E)

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July 1997
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NOTES:

- CONTRACTOR TO PROVIDE BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE.
- DIVIDE THRUST BY SAFE BEARING LOAD TO DETERMINE REQUIRED AREA (IN SQUARE FEET) OF CONCRETE TO DISTRIBUTE LOAD.
- AREAS TO BE ADJUSTED FOR OTHER PRESSURE CONDITIONS.
- PROVIDE TWO 1" MINIMUM DIAMETER RODS ON VALVES UP THROUGH 10" DIAMETER. VALVES LARGER THAN 10" REQUIRE SPECIAL TIE ROD DESIGN.

		A	B	C	D	E
Size	Test Pressure PSI	Tee Dead Ends	90° Bend	45° Bend	22.5° Bend	11.25° Bend
4"	250	3,140	4,440	2,405	1,225	615
6"	250	7,070	9,995	5,410	2,760	1,385
8"	250	12,565	17,770	9,620	4,905	2,465
10"	250	19,635	27,770	15,030	7,660	3,850
12"	250	28,275	39,985	21,640	11,030	5,545
14"	250	38,485	54,425	29,455	15,015	7,545
16"	250	50,265	71,085	38,470	19,615	9,855

Thrust at Fittings in Pounds

Soil Type	Safe Bearing Load PSF
Muck, peat, etc.	0
Soft clay	1,000
Sand	2,000
Sand and gravel	3,000
Sand and gravel cemented with clay	4,000
Hard shale	10,000

Greenfield Department of Public Works

July 1997
By: S.J. Roberts
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TRENCH PATCH

PERMANENT TRENCH PATCH DETAIL
"TYPE C"

EXISTING PAVEMENT

TACK COAT

MATCH EXISTING PAVEMENT DEPTH (4" MINIMUM)

SAWCUT PAVEMENT BOTH SIDES

18" PROCESSED GRAVEL (95% COMPACTION)

MATCH EXISTING DEPTH OF BIT. CONCRETE (4" MINIMUM)

BACKFILL SHALL BE TAMPED IN SUCCESSIVE LAYERS NOT TO EXCEED 6" IN DEPTH.

NO FROZEN MATERIAL SHALL BE USED AS BACKFILL.

VARIES

VARIES

VARIES

NOTES:

- THE PATCH SHALL EXTEND 6" BEYOND EACH SIDE OF THE TRENCH.
- THE PATCH SHALL BE NEAT, UNIFORM AND CONFORM TO THE EXISTING GRADE.
- ANY DISTURBED AREA SHALL BE REPLACED IN KIND (LOAMED, FERTILIZED, LIMED AND SEEDED, BIT. CONC., GRAVEL, ETC.).
- FOR TRENCHES OVER 100' IN LENGTH THAT REQUIRE PATCHING THE FULL LANE WIDTH OF A TWO LANE ROAD OR FULL ROAD WIDTH OF A ONE WAY ROAD, ALL AREAS BEYOND THE LIMITS OF EXCAVATION SHALL BE MILLED DOWN 1.5" AND TACK COATED PRIOR TO PLACEMENT OF HMA.

Greenfield Department of Public Works

July 1997
By: S.J. Roberts
T:\Engineering\CAD_Resources\Highway\Patch_C_Detail.dwg

Revised 12/10/15 & 3/1/19



Greenfield Department of Public Works Engineering

189 Wells Street
Greenfield, MA 01301
Phone:(413)772-1528

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COMMENTS					
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NASH'S MILL ROAD 12" WATER MAIN INSTALLATION					
D2					
Designed by: SL		Date: 4/18/2023		SHEET: 9 OF 9	
Drawn by: SL					
Checked by: AT					

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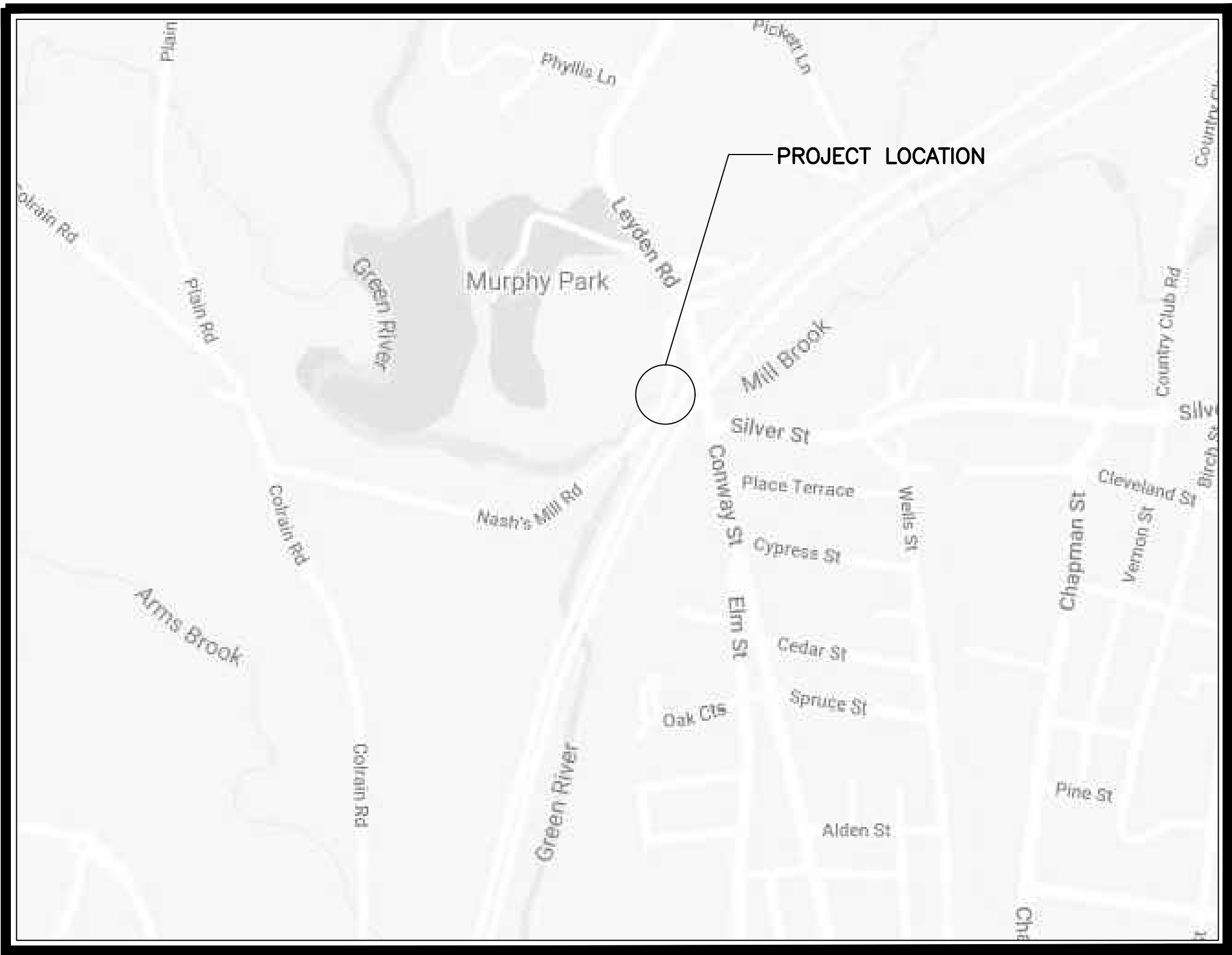
CITY OF GREENFIELD, MA

PROPOSED WATER MAIN BRIDGE ATTACHMENT

BRIDGE NO. G-12-006 (BWN)

NASH'S MILL ROAD OVER GREEN RIVER

INDEX	
SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	NOTES
3	PLAN AND ELEVATION
4	DETAILS



CITY OF
GREENFIELD, MA



IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS THEY ARE
ACTUALLY UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL
ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND-
SCAPE ARCHITECT TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THIS
STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING
ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND-
SCAPE ARCHITECT SHALL STAMP THE DOCUMENT AND INCLUDE THE
NOTATION "ALTERED BY:" FOLLOWED BY THEIR SIGNATURE, THE
DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION
OF THE ALTERATION.

PROPOSED WATER MAIN
BRIDGE ATTACHMENT

BRIDGE NO. G-12-006 (BWN)
NASH'S MILL ROAD
OVER GREEN RIVER

No.	Submittal / Revision	App'd.	By	Date
0	IFC	AJ	PP	5/23

TITLE SHEET &
INDEX

Designed By: APJ	Drawn By: APJ	Checked By: PMP
Issue Date: 04/03/23	Project No: 081274	Scale: AS NOTED

Drawing No.:

1 OF 4

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Saved: 5/2/2023 7:06:37 PM Plotted: 5/2/2023 7:16:13 PM Current User: Perkins, Peter Last Saved By: 1151

GENERAL NOTES

1. ALL CONSTRUCTION IS TO BE IN ACCORDANCE WITH MASSDOT STANDARD DETAILS AND SPECIFICATIONS.
2. PROPERTY LINE INFORMATION SHOWN HERE IS COMPILED FROM VARIOUS SOURCES AND DOES NOT REPRESENT A PROPERTY LINE RETRACEMENT SURVEY.
3. VERTICAL DATUM, RIM, INVERT AND SPOT ELEVATIONS ARE PUBLISHED FOR DESIGN PURPOSES ONLY.
4. LOCATIONS OF SUBSURFACE UTILITIES SHOWN HEREON ARE APPROXIMATE AND ADDITIONAL UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THIS PLAN. LOCATIONS ARE COMPILED FROM UTILITY PLANS OF RECORD, DIG-SAFE FIELD MARKINGS, RIM AND INVERT INFORMATION HAS BEEN COMPILED AND FIELD VERIFIED WHERE POSSIBLE. THIS INFORMATION IS NOT TO BE USED FOR CONSTRUCTION. PRIOR TO ANY CONSTRUCTION, CONTACT DIG-SAFE AT (1-800-344-7233) TO FIELD VERIFY LOCATION OF ALL UTILITIES.
5. THE CONTRACTOR SHALL MAKE DETERMINATIONS OF SUBSURFACE CONDITIONS, INCLUDING THE LOCATION OF ROCK AND THE ACTUAL LOCATION OF UTILITIES OR OTHER FEATURES WHICH MAY AFFECT THE WORK.
6. THE CONTRACTOR SHALL CAUSE AS LITTLE INTERFERENCE AND INCONVENIENCE TO ABUTTERS AS POSSIBLE. THE CONTRACTOR SHALL MAINTAIN SAFE AND CONVENIENT ACCESS TO PRIVATE PROPERTIES AT ALL TIMES.
7. THE FLOW OF TRAFFIC THROUGH CONSTRUCTION ZONES IN EXISTING PUBLIC WAYS SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE SPECIFIED ON THE PLANS AND IN THE SPECIAL PROVISIONS.
8. EXISTING DIMENSIONS ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE & VERIFY ALL PRESENT DIMENSIONS AND DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY & ACCURACY THEREOF, AND SHALL NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL HE/SHE HAS MADE THE REQUIRED MEASUREMENTS, AND THE EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.
9. PLANS FOR THE EXISTING BRIDGE ARE AVAILABLE THROUGH THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION PLANS AND RECORDS ROOM IN BOSTON.

GENERAL WATER MAIN NOTES:

1. ALL WATER MAIN PIPE SHALL BE CEMENT LINED DUCTILE IRON AS SPECIFIED BY THE CITY.
2. ALL PIPE JOINTS ON THE BRIDGE SHALL BE RESTRAINED. THRUST RESTRAINT SHALL BE ACCOMPLISHED BY A COMBINATION OF PIPE MANUFACTURER PROVIDED JOINT RESTRAINT SYSTEM (SUCH AS "FIELD LOK" GASKETS) WITH MECHANICAL JOINT WEDGE ACTION RETAINER GLANDS AND THRUST BLOCKS AT FITTINGS PER CITY STANDARDS
3. THE CONTRACTOR SHALL UTILIZE COMPACT DUCTILE IRON FITTINGS IN ACCORDANCE WITH ANSI/AWWA C153/A21.53, PER CITY WATER DEPARTMENT STANDARDS.
4. CONFORM TO CITY OF GREENFIELD WATER DEPARTMENT STANDARDS, UNLESS OTHERWISE DIRECTED. REFER TO WATER DEPARTMENT STANDARDS FOR STANDARDIZED MANUFACTERS/MODELS OF WATER APPURTENANCES SUCH AS HYDRANTS, VALVES, BOXES, SERVICE FITTINGS, ETC.
5. CONFORM TO WATER MAIN DETAILS ON SHEET NO. 4.
6. ALL EXISTING UNDERGROUND FEATURES ARE APPROXIMATE AND ARE INDICATED FOR GENERAL REFERENCE ONLY UNLESS OTHERWISE NOTED. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING EXPLORATORY EXCAVATIONS AS NECESSARY TO DETERMINE UNDERGROUND CONDITIONS AND SHALL PROCEED WITH GREAT CARE IN EXECUTING WORK.
7. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE ENGINEER.
8. CONNECTIONS TO EXISTING WATER SYSTEM AND WATER SERVICES SHALL BE COMPLETED ONLY AFTER THE NEW WATER SYSTEM IS PRESSURE/LEAKAGE TESTED, DISINFECTED, AND ACCEPTED BY THE ENGINEER AND LOCAL AUTHORITY HAVING JURISDICTION.
9. NO WATER SERVICES ARE REQUIRED.
10. NO VALVE BOXES ARE REQUIRED.

REQUIRED TESTING OF WATER MAINS:

1. PERFORM THE FOLLOWING AFTER THE PIPE HAS BEEN INSTALLED AND PRIOR TO FINAL ACCEPTANCE:
1.1.PRESSURE TEST
1.2.LEAKAGE TEST
2. AN INDEPENDENT THIRD PART AUTHORIZED BY THE CITY WATER DEPARTMENT AND PAID FOR BY THE CONTRACTOR SHALL CONDUCT THE PRESSURE/LEAKAGE TESTS. BOTH A REPRESENTATIVE OF THE CITY WATER DEPARTMENT AND THE CONTRACTOR SHALL WITNESS IT. A WRITTEN REPORT SHALL BE SUBMITTED TO THE CITY WATER DEPARTMENT FOR REVIEW PRIOR TO ACCEPTANCE OF SAID TEST.
3. PRESUMPTIVE HYDROSTATIC TESTS MAY BE PERFORMED WHEN THE SYSTEM IS PARTIALLY BACKFILLED TO "CHECK" THE WORK, BUT FINAL ACCEPTANCE SHALL BE BASED ON HYDROSTATIC TESTS PERFORMED ON THE FINISHED SYSTEM AFTER IT IS COMPLETELY BACKFILLED.
4. ACCEPTANCE SHALL BE DETERMINED ON THE BASIS OF ALLOWABLE LEAKAGE. IF ANY PIPE SECTION DISCLOSES LEAKAGE GREATER THAN THAT SPECIFIED, LOCATE, REPAIR, AND RETEST UNTIL THE LEAKAGE IS WITHIN THE LIMITS SPECIFIED.
5. MAKE ALL VISIBLE LEAKS TIGHT REGARDLESS OF THE AMOUNT OF LEAKAGE.
6. REPAIR OR REPLACE ALL DEFECTIVE WORK AT NO COST TO OWNER.

DUCTILE IRON WATER MAINS:

1. PRESSURE AND LEAKAGE TEST SHALL COMPLY WITH THE MOST CURRENT REVISION OF AWWA C600.
2. PERFORM THE FOLLOWING AFTER THE PIPE HAS BEEN INSTALLED AND PRIOR TO FINAL ACCEPTANCE:
2.1.PRESSURE TEST
2.2.LEAKAGE TEST
3. PRESUMPTIVE HYDROSTATIC TESTS MAY BE PERFORMED WHEN THE SYSTEM IS PARTIALLY BACKFILLED TO "CHECK" THE WORK, BUT FINAL ACCEPTANCE SHALL BE BASED ON HYDROSTATIC TESTS PERFORMED ON THE FINISHED SYSTEM AFTER IT IS COMPLETELY BACKFILLED.
4. PRESSURE TEST:
a. TEST PIPING TO 150 PSI MINIMUM AT THE HIGHEST ELEVATION ALONG THE TEST SECTION AND NOT LESS THAN 200 PSI AT THE LOWEST ELEVATION OF THE TEST SECTION UNLESS OTHERWISE APPROVED BY THE CITY WATER DEPARTMENT AND ENGINEER. MEASURE TEST PRESSURES AT THE LOWEST POINT IN THE PIPE SECTION AND CORRECT TO THE ELEVATION OF THE GAUGE.
b. RELIEVE TRAPPED AIR AT THE SECTION HIGH POINTS THROUGH HYDRANTS, OR TAPS INSTALLED FOR THIS PURPOSE, PROVIDED TEMPORARY INSTALLATION ARE REMOVED AND PLUGGED AFTER ACCEPTANCE.
c. MAINTAIN TEST PRESSURE FOR A PERIOD OF 2 HOURS. AT THE END OF THE TEST PERIOUD, IF THE TEST RPRESSURE REMAINS CONSTANT, THE PIPE SECTION SHALL HAVE PASSED THE TEST. IF THE PRESSURE HAS DROPPED, IT SHALL BE BROUGHT BACK TO THE TEST PRESSURE BY PUMPING A KNOWN VOLUME OF WATER (BY PUMPING FROM A GRADUATED CYLINDER OR BY METERING) BACK INTO THE PIPE. THE VOLUME OF WATER THUS USED, REPRESENTING LEAKAGE FROM THE PIPE, SHALL BE RECORDED. IF THE LEAKAGE IS LESS THAN THE ALLOWABLE LEAKAGE SPECIFIED BELOW, THE PIPE SHALL HAVE PASSED THE TEST. IF THE LEAKAGE EXCEEDS THE ALLOWABLE LEAKAGE SPECIFIED, THE CONTRACTOR SHALL LOCATE THE LEAK, PERMANENTLY REPAIR THE SECTION OF THE PIPE WHERE THE LEAK IS OCCURRING TO THE SATISFACTION OF THE ENGINEER, AND RETEST THE PIPE AS SPECIFIED ABOVE.
5. LEAKAGE TEST:
a. CONDUCT THE LEAKAGE TEST CONCURRENTLY WITH THE PRESSURE TEST.
b. PERFORM THE LEAKAGE TEST IN ACCORDANCE WITH APPLICABLE AWWA STANDARDS.
c. THE MAXIMUM ALLOWED LEAKAGE IS DETERMINED BY THE FOLLOWING FORMULA:

$$L = \frac{S \times D \times P^{1/2}}{148,000}$$

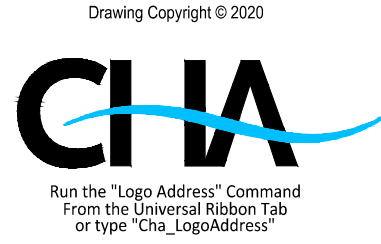
WHERE L = ALLOWABLE LEAKAGE, IN GPH
WHERE S = LENGTH OF PIPE TESTED, IN FEET
WHERE D = NOMINAL PIPE DIAMETER, IN INCHES
WHERE P = AVERAGE TEST PRESSURE, IN PSIG

DISINFECTION OF WATER MAINS:

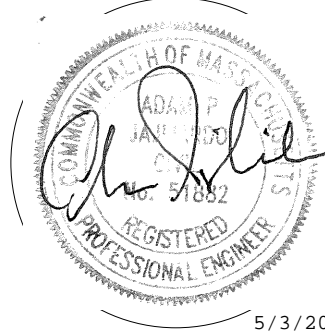
1. DISINFECT ALL POTABLE WATER MAINS IN ACCORDANCE WITH THE LATEST VERSION OF AWWA C651 EXCEPT THAT THE PLACEMENT OF CHLORINE POWDER OR TABLETS INSIDE THE PIPE DURING INSTALLATION SHALL NOT BE ALLOWED. DISINFECT WATER MAINS AFTER THE PIPING HAS PASSED THE PRESSURE AND LEAKAGE TESTING.
2. FLUSH THE PIPE WITH WATER AT A MINIMUM VELOCITY OF 3.0 FEET PER SECOND (FPS) PER AWWA C651 TO CLEAR ALL FOREIGN MATERIAL FROM THE PIPE.
3. APPLY A CHLORINE SOLUTION WITH A CONCENTRATION BETWEEN 50 PARTS PER MILLION (PPM) AND 100 PPM. THE CHLORINE SOLUTION SHALL REMAIN IN THE PIPING FOR A MINIMUM OF 24 HOURS. THE CONCENTRATION AT THE END OF THIS PERIOD SHALL BE AT LEAST 25 PPM IN ALL SECTIONS OF THE MAIN. REPEAT THE ENTIRE PROCEDURE IF THE RESIDUAL IS LESS THAN 25 PPM.
a. WHILE THE CHLORINATED WATER IS BEING ADDED, ALL APPURTENANCES (VALVES, HYDRANTS, ETC.) SHALL BE OPERATED SO AS TO COMPLETELY DISINFECT THE NEW WORK.
b. POSITION VALVES SO THAT THE CHLORINE SOLUTION IN THE SECTION BEING DISINFECTED WILL NOT FLOW INTO WATER MAINS IN ACTIVE SERVICE.
c. CHLORINE RESIDUAL SAMPLES SHALL BE TAKEN AS DIRECTED BY THE ENGINEER.
4. AFTER THE 24-HOUR RETENTION PERIOD, FLUSH THE MAIN UNTIL RESIDUAL TESTING INDICATES THAT THE CHLORINE CONCENTRATION IS APPROXIMATELY THAT OF THE NEIGHBORING SERVICE AREA.
a. THE PIPELINE SHALL BE DECHLORINATED BY MEANS OF FLUSHING THE HEAVILY CHLORINATED WATER THROUGH A DECHLORINATING DEVICE TO REMOVE THE CHLORINE RESIDUAL BEFORE RELEASING THE WATER TO THE DRAINAGE SYSTEM.
b. THE LOCAL AUTHORITY HAVING JURISDICTION SHALL PREAPPROVE THE DECHLORINATION METHOD AND TYPE OF DECHLORINATION CHEMICALS TO BE USED IN ADDITION TO THE DISPOSAL LOCATION.
5. AFTER DISINFECTION AND FINAL FLUSHING, AND PRIOR TO PLACING THE LINES IN SERVICE, THE CONTRACTOR SHALL COLLECT BACTERIOLOGICAL SAMPLES (BOTH COLIFORM AND HETEROTROPHIC PLATE COUNT) AND SUBMIT SAMPLES TO AN APPROVED TESTING LABORATORY. TWO CONSECUTIVE SETS OF SAMPLES SHALL BE TAKEN AT LEAST 24 HOURS APART IN ACCORDANCE WITH AWWA C651. THE COLLECTION POINTS SHALL BE AS DIRECTED BY THE ENGINEER AND LOCAL AUTHORITY HAVING JURISDICTION.
a. THE TESTING LABORATORY PERFORMING THE BACTERIOLOGICAL ANALYSIS SHALL BE ACCEPTABLE TO THE ENGINEER.
b. SUBMIT 3 COPIES OF THE LABORATORY ANALYSIS TO THE ENGINEER.
c. SHOULD SAFE RESULTS NOT OCCUR AFTER LABORATORY TESTS, THE CONTRACTOR SHALL, AT HIS EXPENSE, REPEAT THE DISINFECTION PROCEDURE UNTIL SAFE RESULTS ARE OBTAINED. THIS INCLUDES A POSITIVE RESULT FOR COLIFORM OR A MEASURED HETEROTROPHIC PLATE COUNT OF GREATER THAN 500 COLONY FORMING UNITS PER ML.
d. CONTRACTOR SHALL PAY FOR ALL TESTING REQUIRED.
6. ALL PRECAUTION SHALL BE TAKEN TO MAINTAIN DRY AND SANITARY CONDITIONS AND PREVENT CONTAMINATION OF ANY PIPING. IF, IN THE OPINION OF THE ENGINEER, CONTAMINATION HAS OCCURRED, THE CONTRACTOR SHALL REPEAT THE DISINFECTION PROCEDURE AND TESTING AT HIS COST AND EXPENSE.

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
1	12" DIA. WATER MAIN (MECHANICAL JOINT) W/INSUL. & JACKET	FT	150
2	12" DIA. 45 DEGREE ELBOW	EA	4
3	12" WATER PIPE SUPPORT	EA	5
4	20"x9"x $\frac{3}{8}$ " A36 PLATE GALV.	EA	5
5	10 $\frac{1}{2}$ "x10 $\frac{1}{2}$ "x $\frac{3}{8}$ " A36 PLATE GALV.	EA	5
6	A325 $\frac{3}{4}$ " BOLT, NUT, WASHERS GALV.	EA	35
7	4000 PSI, 1 $\frac{1}{2}$ ", 565 CEMENT CONC.	CY	1
8	A615 GR 60 STEEL REINFORCING	LB	220
9	16" DIA. GALV. PIPE SLEEVE	LF	4
10	PULL ON END SEAL	EA	2
11	CASING SPACER	EA	2
12	LINK SEAL	EA	4
13	SPC-B-12.5 SUPERPAVE	TON	1
14	1" CLOSED CELL FOAM	SF	AS REQ.
15	BITUMINOUS DAMP PROOFING	SY	2
16	REINFORCED CONCRETE EXCAVATION	LS	1



CITY OF
GREENFIELD, MA



5/3/2023

IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS THEY ARE ACTING UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED. THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

PROPOSED WATER MAIN
BRIDGE ATTACHMENT


BRIDGE NO. G-12-006 (BWN)
NASH'S MILL ROAD
OVER GREEN RIVER

No.	Submittal / Revision	App'd. By	Date
0	IFC	AJ PP	5/23

NOTES

Designed By: APJ	Drawn By: APJ	Checked By: PMP
Issue Date: 04/03/23	Project No: 081274	Scale: AS NOTED

Drawing No.:

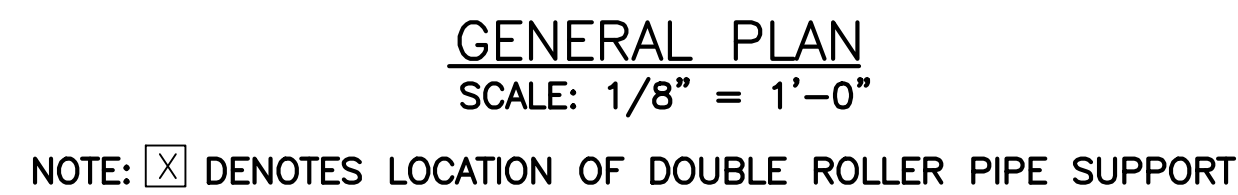


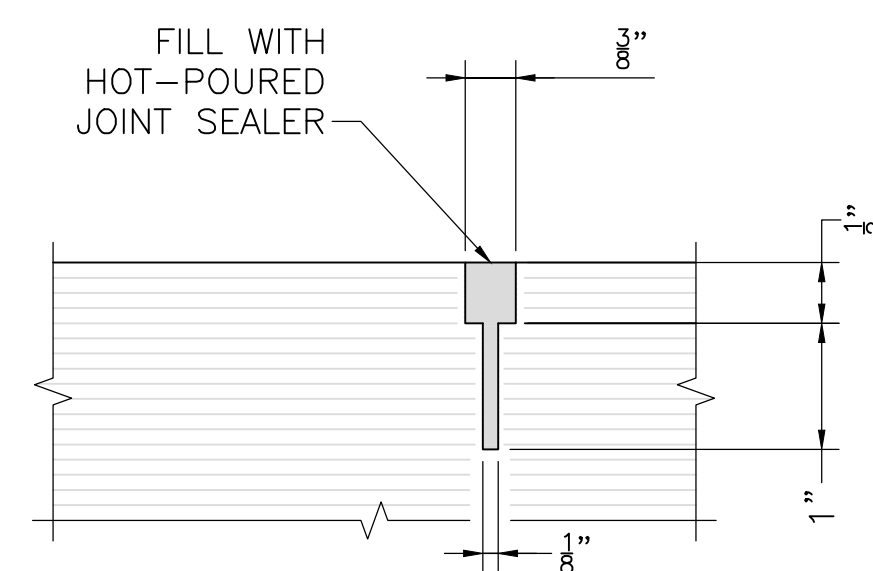
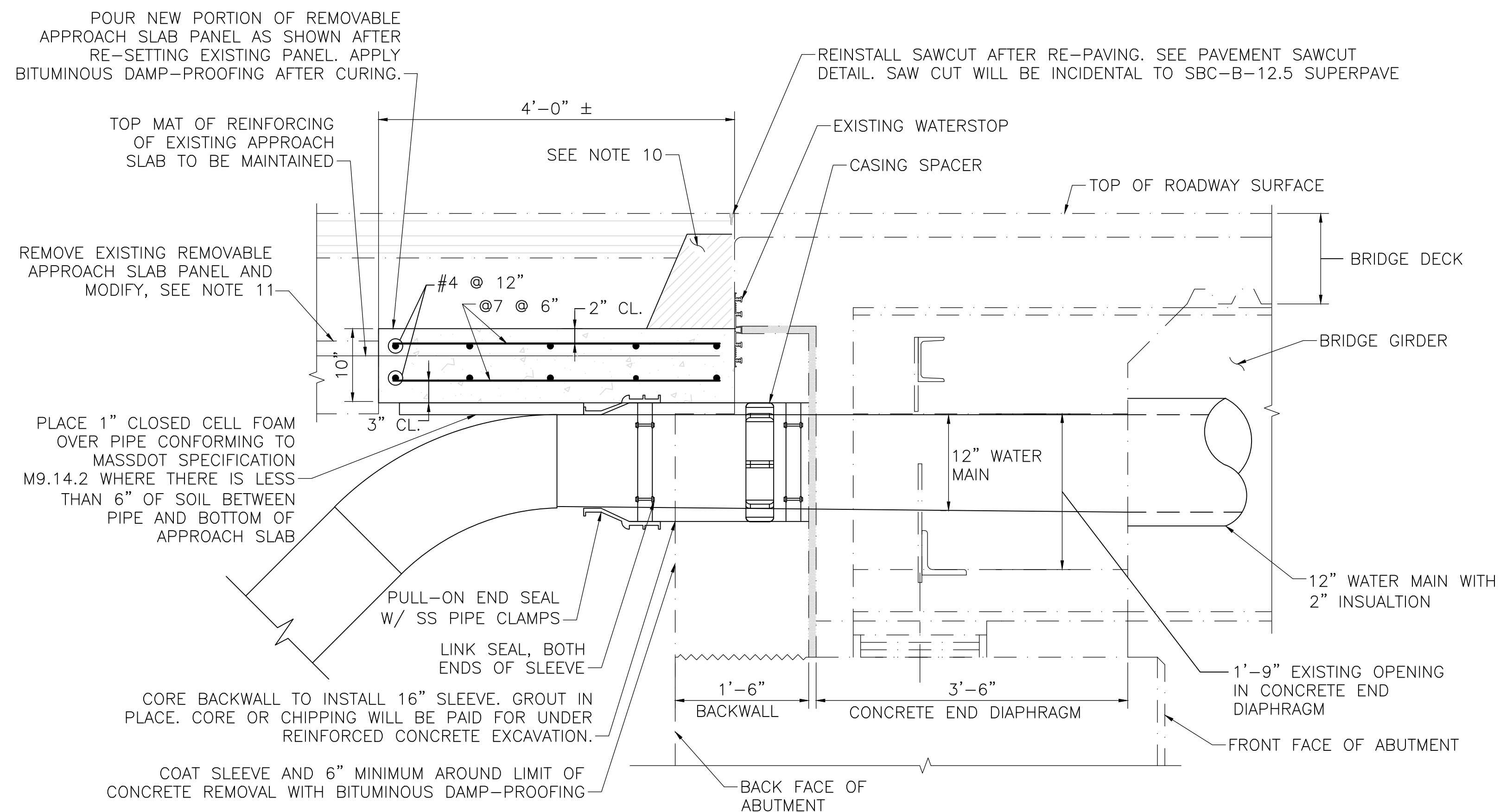
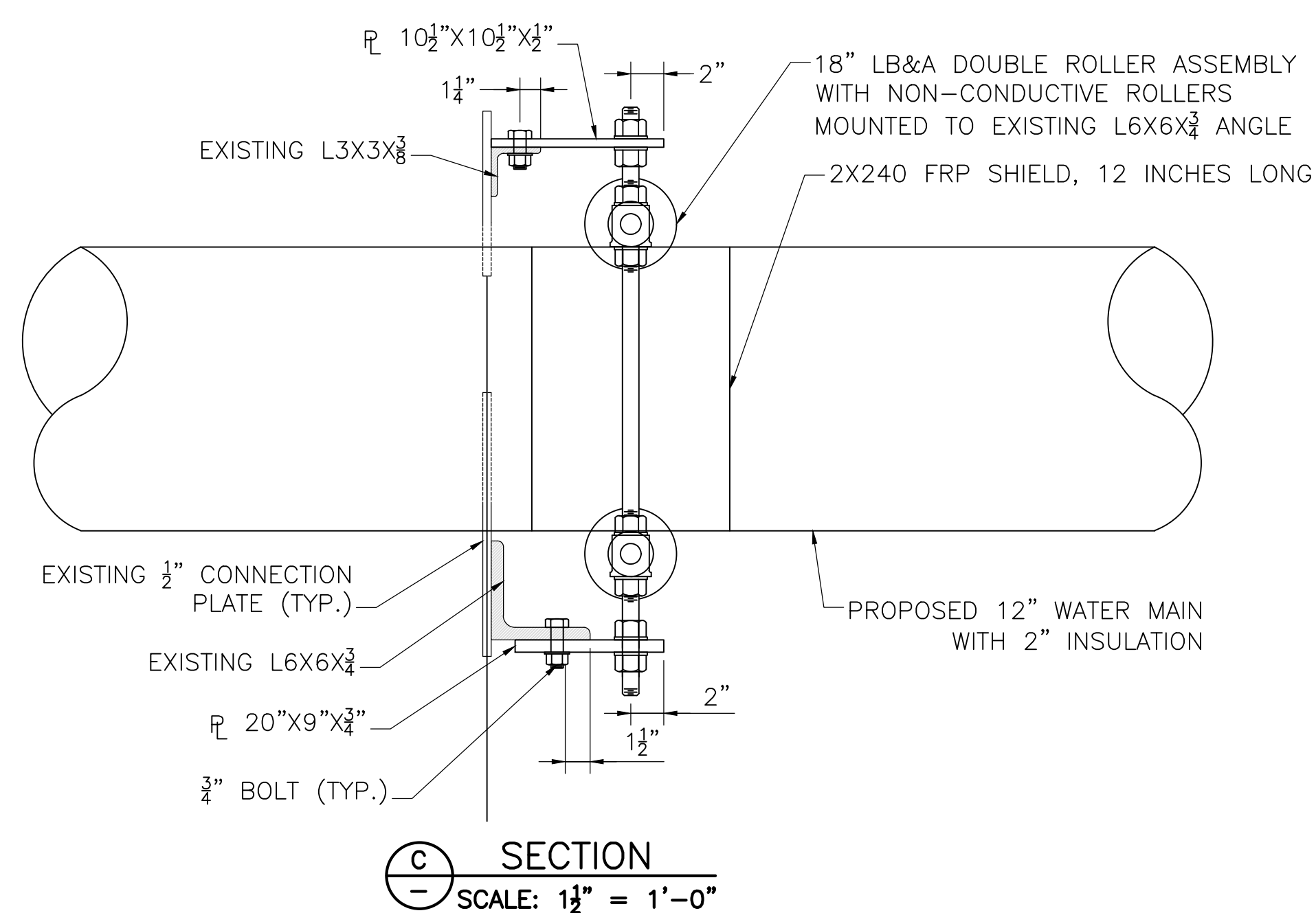
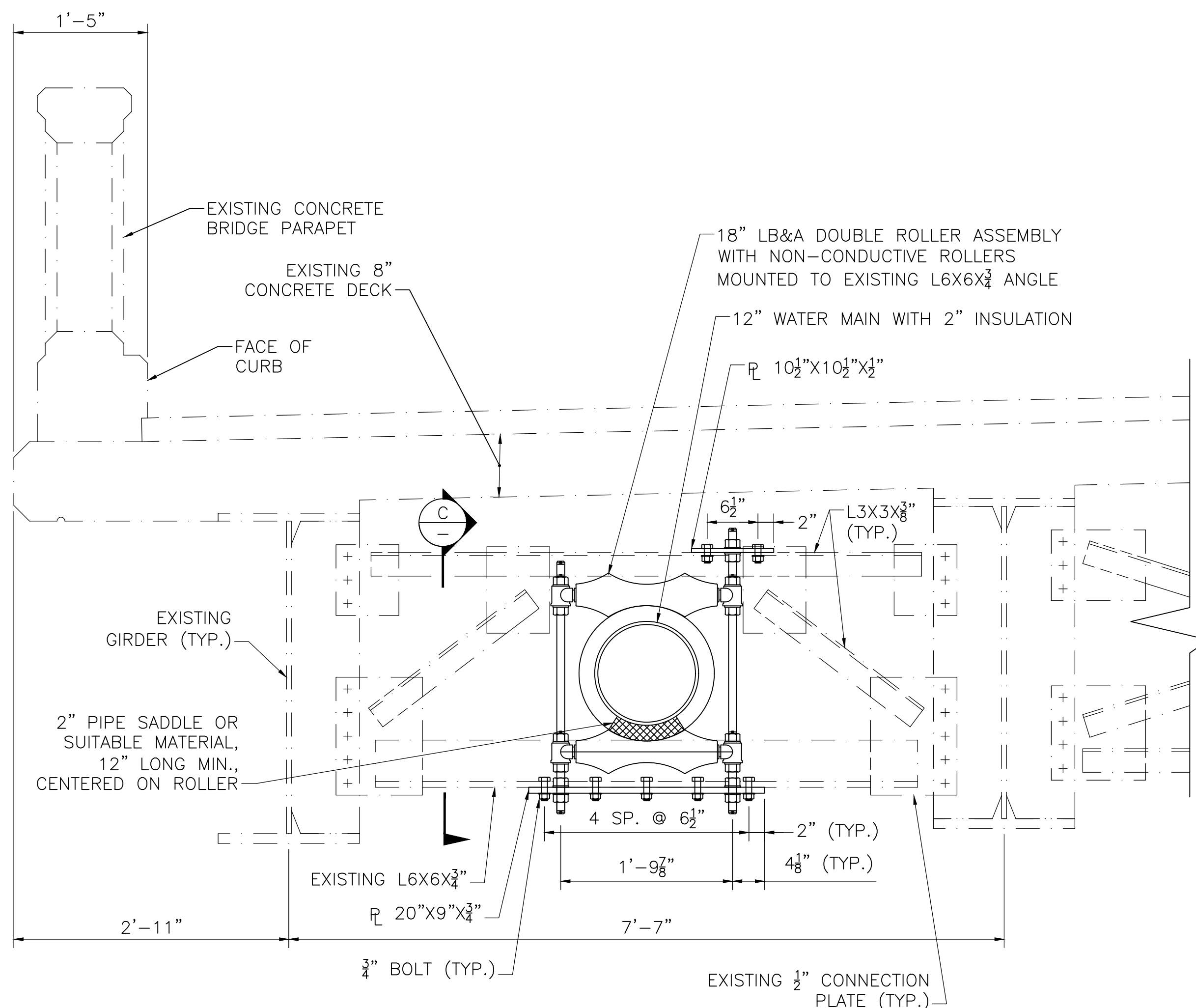
5/3/2023

Submittal / Revision	App'd.	By	Date
FC	AJ	PP	5/23

Drawn By: APJ	Drawn By: APJ	Checked By: PMP
Date: 03/23	Project No: 081274	Scale: AS NOTED

OF 4





- NOTES:

1. ALL DIMENSIONS SHOWN ON THESE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION.
2. THE CONTRACTOR SHALL PROVIDE A PLAN DETAILING THE LOCATION OF ALL PIPE JOINTS.
3. STEEL SLEEVE SHALL BE ASTM A53 GRADE B AND SHALL BE GALVANIZED PER ASTM A123.
4. STEEL PLATES SHALL BE ASTM A36, AND SHALL BE GALVANIZED OR EQUAL PER ASTM A153 AFTER FABRICATION.
5. BOLTS SHALL BE ASTM F3125, GRADE A325. AND SHALL BE GALVANIZED OR EQUAL PER ASTM A153.
6. NUTS SHALL BE ASTM A563, GRADE A, AND WASHERS SHALL BE ASTM A36, TYPE 1. NUTS AND WASHERS SHALL BE GALVANIZED OR EQUAL PER ASTM A153.
7. DAMAGE TO GALVANIZING SHALL BE REPAIRED PER ASTM A780.
8. THE ROLLER SUPPORT AND HARDWARE SHALL BE STAINLESS STEEL, SS304.
9. CONCRETE FOR APPROACH SLAB SHALL BE 4000 PSI, 1½", 565 CEMENT CONCRETE, PER MASSDOT REQUIREMENTS.
10. PROTECTIVE COURSE TO BE SUPERPAVE BRIDGE PROTECTIVE COURSE (SPC-B-12.5), PER MASSDOT REQUIREMENTS, PLACED IN 2" LAYERS AND COMPACTED WITH A MECHANICAL HAND-GUIDED TAMPER. EXISTING MEMBRANE WATERPROOFING FOR BRIDGE DECK SHALL BE MAINTAINED.
11. REMOVE EXISTING REMOVABLE APPROACH SLAB PANELS, SAW CUT AND REMOVE 4 FT. OF END PANEL MAINTAINING EXISTING REINFORCING. AFTER RE-SETTING PANEL, POUR NEW END OF PANEL TO FORM AROUND WATER PIPE AND SLEEVE. CONCRETE REMOVAL WILL BE PAID UNDER REINFORCED CONCRETE EXCAVATION.
12. WATER PIPE INSULATION SHALL BE A URETHANE INSULATION 2" THICK MINIMUM, CONFORMING TO MASSDOT STANDARD SPECIFICATION M9.11.4.
13. THE PIPE SHALL HAVE A WATERPROOF JACKET OF CORRUGATED ALUMINUM, 0.02 IN. THICK, SECURED WITH STAINLESS STEEL STRAPPING. WATERPROOF JACKET SHALL CONFORM TO MASSDOT STANDARD SPECIFICATION M9.11.5.
14. CASING SPACERS WILL BE 8", STAINLESS STEEL, CENTER-RESTRAINED, WITH INTEGRAL RUNNER.
15. END SEALS WILL BE EPDM, PULL-ON TYPE WITH STAINLESS STEEL BANDS.

No.	Submittal / Revision	App'd.	By	Date
0	IFC	AJ	PP	5/23

DETAILS

Designed By: APJ	Drawn By: APJ	Checked By: PMP
Issue Date: 04/03/23	Project No: 081274	Scale: AS NOTED