Portland Water District

From Sebago Lake to Casco Bay

SAWYER STREET
WATER MAIN REPLACEMENT

ADDENDUM NO. 1
TO
CONTRACT DOCUMENTS
FOR

BIDDING AND CONTRACT REQUIREMENTS AND SPECIFICATIONS
VOLUME 1 OF 1

DATE: JANUARY 23, 2023

Prepared By:
PORTLAND WATER DISTRICT
225 Douglass Street
Portland, ME 04104

SPECIFICATION UPDATES

1. **Section 00020 – Notice to Bidders**. Updated to reflect change in Bid Opening Date to January 30, 2024.
2. **Section 00410 – Bid Form**. Updated to reflect change from 12-inch Insertion Valve to 12-inch cut-in valve.
3. **Section 01250 – Measurement & Payment**. Updated to reflect change from 12-inch Insertion Valve to 12-inch cut-in valve as well a revise typo related to Schedule of Payment portions of Section 1.03.
4. **Section 02537 – Water Distribution System**. Updated to reflect material requirements for HDPE main.

DRAWINGS

1. **Sheet W4**. Updated match lines.
2. **Sheet W5**. Updated match lines.
3. **Sheet W6**. Updated match lines.
4. **Sheet W7**. Updated match lines.
5. **Sheet W8**. Updated match lines.
6. **Sheet W9**. Updated match lines and change the proposed Insertion Valve to a Cut-in Valve.
7. **Sheet W10**. Updated to clarify what portions of the project Items W7 and W26 refer to.
8. **Sheet D2**. Updated to reflect changes to align Service trench restoration details with Main details.

ATTACHMENTS

1. Project Question Log
2. Section 00020 - Notice to Bidders - Revised
3. Section 00410 - Bid Form - Revised
4. Section 01250 - Measurement and Payment - Revised
5. Section 02537 - Water Distribution System - Revised
6. Sheet W4 - Revised
7. Sheet W5 - Revised
8. Sheet W6 - Revised
9. Sheet W7 - Revised
10. Sheet W8 - Revised
11. Sheet W9 - Revised
12. Sheet W10 - Revised
13. Sheet D2 - Revised
14. Raised Sidewalk Detail

Portland Water District

Sawyer Street – Water Main Replacement Project

Bidding – Question & Response Log

Last Revised: 1/23/23

1. **Is any of the work for this project required to be done at night?**
    a. *Night work is not expected to be required for this project.*
2. **Please clarify what is taking place with the surface pavement for the trench restoration on all streets.**
    a. *Sawyer Street will not require surface pavement. All other streets will require surface pavement. See notes on the Trench Detail in the Standard Details.*
3. **Is milling of any trench surface required? If so, where?**
    a. *All streets that require surface pavement will require milling the following year. See notes on the Trench Detail in the Standard Details.*
4. **Do you have any test pit/drill information to support the quantity of 150 CY of rock excavation? How was the quantity of ledge arrived at?**
    a. *PWD does not have any record of ledge in the area. Test pits/borings were not performed ahead of this project. The quantity of ledge is an estimate based on an assumed depth over the total length of the project.*
5. **Is there detail for item W35 that I missed? If not, please supply one**
    a. A detail shall be supplied with Addendum 1.
6. **Please clarify where items W4 & W7 are to be used**
    a. *The 12-inch HDPE is to be installed in Sawyer Street (Sheet W8). The 4-inch PVC main and 4-inch valve is related to the project work in the Boys & Girls Club parking lot (Sheet W10)*
7. **Any ledge anticipated on this project?**
    a. *PWD does not have any record of ledge in the area. Test pits/borings were not performed ahead of this project.*
8. **Please provide an insertion valve specification.**
    a. *The Insertion Valve has been replaced with a cut-in valve in Addendum 1. The Bid Form and Measurement & Payment Sections have been revised accordingly.*
9. **Will the DI pipe be delivered or does it need to be picked up?**
    a. *The Contractor is responsible for coordinating with PWD and picking up the pipe stored at the PWD Pit on Gambo Road in Windham.*
10. **Where is the pipe stored?**
    a. *Pipe for this project is stored at the PWD Pit on Gambo Road in Windham.*

11. Is Sawyer St. getting some other treatment?

    a. *PWD is completing this project ahead of anticipated paving of Sawyer Street by the City of South Portland.*

12. Can the contractor pull individual services?

    a. *PWD specifications do not have any restrictions on pulling services. Services must be meet the vertical separation requirements of the oil line in Sawyer Street.*

13. If the contractor opens a trench, do they do full pavement width?

    a. *Trench restoration should be in line with the trench restoration detail in the Standard Details. Unit items are paid as outlined in the Measurement & Payment Section within the spec.*

14. Are there any wage rates?

    a. *No.*

15. Does the contractor use saddles on HDPE?

    a. *There are no services on the proposed HDPE main.*

16. Can the contractor shutdown any side streets? Might a question for the city.

    a. *This will be better answered by the City when submitting the traffic control plan for the Street Opening Permit.*

17. The schedule of items under Schedule of Payment, a lot of them say "Schedule of Pavement" instead of "Payment,"

    a. *This will be revised in Addendum 1.*

18. Where does it indicate which sections of the existing water line are being abandoned and which are being removed?

    a. *When the existing water main falls within the trench (widths outlined in Standard Details), it should be removed. When the existing main falls outside of the trench, the main may be abandoned in place. The proposed main is within the existing trench as much as practical to minimize the amount of abandoned main.*

19. Are the fire hydrants on Front St. getting abandoned or is the red dashed just line indicating a fire line?

    a. *There is no work proposed related to the existing hydrants in Front Street.*

20. Can boring method be completed on suitable pipe application?

    a. *The standard method for installation outlined in the project is trenching. The Contractor may propose alternatives such as trenching to be reviewed by PWD.*

21. Will PWD allow for asphalt escalation?

    a. *Yes, this is outlined in the Measurement & Payment Section.*

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Section 00020

Notice to Bidders

Sealed bids for the construction of **Sawyer Street Water Main Replacement, South Portland** to be received by the Portland Water District, 225 Douglass Street, Portland, Maine until **3:00 p.m. local time, January 30, 2024**.

Bids may be hand delivered one (1) hour prior to Bid opening time (**from 2:00pm to 3:00pm on January 30, 2024.**) The Purchasing Agent, Wesley Gilbert, will receive Bids in person at the Nixon Training Room entrance at 225 Douglas Street, Portland, Maine 04012. Please contact Wesley in advance of drop-off at 207-774-5961 ext. 1007 or if you wish to drop off a bid earlier than the specified window. The bid opening will be hosted **in person** in the District's Nixon Training Room at the address listed above.

The work shall generally consist of, but is not necessarily limited to,

1. Installation of approximately 2,770 feet of 12-inch DI water main, 190 feet of 8-inch DI water main, and 50 feet of 6" DI water main.
2. Installation of approximately 70 feet of 12-inch HDPE water main, 190 feet of 8-inch HDPE water main, and 50 feet of 6" HDPE water main.
3. Installation of approximately 190 feet of 4-inch PVC water main,
4. Installation of temporary water main and other related appurtenances along the water main.

Electronic copies of contract documents may be obtained upon request, contact Wesley Gilbert, Purchasing Agent, 207-774-5961 ext.1007, wgilbert@pwd.org to obtain information regarding access to the files. (Paper copies are not available.)

A non-mandatory Pre-Bid Conference will be held for General Contractors **in person** at the District's Nixon Training Room (address listed above) on **Tuesday January 16, 2024 at 2:30 pm**. Attendance by Subcontractors, while encouraged, is not mandatory.

Each proposal must be accompanied by Proposal Guaranty in form of certified check or bid bond in amount of five percent (5%) of the total amount of the bid. A performance bond in an amount equal to one hundred percent (100%) of the contract price, and labor and material payment bonds in like amount will be required prior to execution of the Agreement.

Bidder agrees to begin and complete work with the time frame outlined in the Agreement.

The Bidder is responsible for determining if there are Addenda to the Project by viewing the P.W.D. project website located at www.pwd.org/construction-bids. The bidder is responsible for incorporating addenda into their Bid and referencing the number and date on Article 3 – Bidder's Representations of the Bid form. The Portland Water District will not post Bid Addenda any later than two (2) days prior to the bid opening without individually notifying all plan holders.

No bids may be withdrawn within sixty (60) days after date of opening thereof. Right is reserved to refuse or reject any or all bids or to waive any informality in proposals received and to award work at the discretion of the General Manager acting in the best interests of the Portland Water District.

-- END OF SECTION --

Section 00410

Bid Form

Portland Water District

Sawyer Street (Front to Broadway)

South Portland, Maine

2024 Water Main Replacement

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Portland Water District, 225 Douglass Street, Portland, ME 04102

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	**Addendum, Date**

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid

and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the e execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
W1	12-inch Ductile Iron Water Main (Pipe provided by Owner)	LF	2771	$	$
W2	8-inch Ductile Iron Water Main (Pipe provided by Owner)	LF	187	$	$
W3	6-inch Ductile Iron Water Main (Pipe provided by Owner)	LF	46	$	$
W4	12-inch HDPE Water Main	LF	70	$	$
W5	8-inch HDPE Water Main	LF	186	$	$
W6	6-inch HDPE Water Main	LF	48	$	$
W7	4-inch PVC Water Main	LF	190	$	$
W8	12-inch Gate Valve (Valve provided by Owner)	EA	8	$	$
W9	8-inch Gate Valve (Valve provided by Owner)	EA	13	$	$
W10	6-inch Gate Valve (Valve provided by Owner)	EA	2	$	$
W11	4-inch Gate Valve	EA	1	$	$
W12	8-inch Gate Valve (Cut-in)	EA	1	$	$
W13	6-inch Gate Valve (Cut-in)	EA	5	$	$
W14	12-inch Gate Valve (Cut-in)	EA	1	$	$
W15	Hydrant	EA	5	$	$
W16	1-inch Air Release Valve	EA	3	$	$

W17	1-inch Copper Service - Short side	EA	26	$	$
W18	1-inch Copper Service - Long side	EA	1	$	$
W19	1-inch Copper Service - Reconnect	EA	3	$	$
W20	1.5-inch Copper Service - Short side	EA	2	$	$
W21	1.5-inch Copper Service - Reconnect	EA	1	$	$
W22	2-inch Copper Service - Short side	EA	1	$	$
W23	2-inch Copper Service - Reconnect	EA	1	$	$
W24	1-inch HDPE Service - Long side	EA	12	$	$
W25	2-inch HDPE Service - Long side	EA	1	$	$
W26	4-inch PVC Service	EA	1	$	$
W27	6-inch Ductile Iron Service - Short side	EA	1	$	$
W28	Gravel Borrow	CY	400	$	$
W29	Unsuitable Material Excavated Below Grade	CY	200	$	$
W30	Rock Excavation	CY	150	$	$
W31	Aggregate Subbase Course Type D	CY	1050	$	$
W32	Aggregate Base Course Type A	CY	600	$	$
W33	HMA Binder Course - 19MM	TON	1350	$	$
W34	HMA Surface Course - 9.5MM	TON	50	$	$

W35	Raised Sidewalk Reconstruction	SY	50	$	$
W36	Work Zone Traffic Control	LS	1	$	$
W37	Flagging & Traffic Officer	LS	1	$	$
W38	Police Detail	HR	16	$	$
W39	Foreman	HR	5	$	$
W40	Laborer	HR	5	$	$
W41	Excavator & Operator	HR	5	$	$
W42	Loader & Operator	HR	5	$	$
W43	Dump Truck & Driver	HR	5	$	$
	Total of All Bid Prices				$

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

Section 01250

Measurement and Payment

PART 1 - GENERAL

1.01 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. All measurements for payments will be based on completed work performed in strict accordance with the drawings and specifications, and on the contract bidding and payment item schedules. All work completed under the contract will be measured by the Owner according to the methods outlined below. In cases where the payment clause in the specifications relating to any unit or lump sum price stated in the contract requires that the said unit or lump sum price cover and be considered compensation for certain work or material essential to the item, this same item will not be measured or paid for under any other pay item which may appear elsewhere in the specifications.

B. The Contractor, in case of unit price items measured for payment, shall be paid for the actual amount of work accepted and for the actual amount of materials in place. At the end of each day's work, the Contractor's authorized representative shall meet with the Owner's representative and determine the quantities of unit price work accomplished or completed during the work day. The Owner's representative will then prepare two "Daily Quantity Reports" which shall be signed by both the Contractor's representative and the District's representative. These completed forms will provide the basis for the Contractor's partial payment requests. Items not appearing on the Daily Quantity Report will not be included for payment.

1.02 INCIDENTAL WORK

A. Incidental work items for which separate payment is not made include (but are not limited to) the following items:

1. Dewatering
2. Dust Control
3. Erosion control
4. Traffic control plan
5. Construction signs
6. Trench boxes, steel and/or wood sheeting as required, including that left in place
7. Clean-up
8. Loaming and seeding
9. Restoration of property
10. Repair and replacement of utilities damaged by construction activity and corresponding proper disposal of removed materials
11. Excavation under/near and/or crossing other utilities, including any equipment/supports required for that work
12. Fittings (e.g., crosses, tees, bends, sleeves) shown on the Drawings
13. Bonds, insurance, shop drawings, warranties and other submittals required by the contract documents

14. Temporary construction and other facilities not to be permanently incorporated into the work necessary for construction sequencing and maintenance of operations. Inclusive of but not limited to temporary water supply system and pavement restoration of temporary water supply system trenches outside the limits of payment for pavement associated with permanent water infrastructure replacements.
15. Permits not otherwise paid for or provided by the Owner
16. Facilities for storage of materials to be incorporated into the Work
17. Test pits to determine existing utility locations, soil conditions, and as required to complete the Work
18. Assessment of potential obstructions to project work (e.g., existing pipes, services, conduits, ducts, sewers, etc.) and all arrangements with owners of those obstructions to allow for the project work to take place.
19. Protection of existing trees, buildings, structures, and utilities (both public and private) including poles, signs, services to buildings, buried utilities, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind.
20. Mobilization/demobilization.
21. Clearing, grubbing, and stripping.
22. Saw cutting, removal, and disposal of existing pavement, concrete, and/or cobblestones.
23. Resetting or replacement of existing street signs
24. Pre-construction photographs/videos (as necessary).
25. Providing material for and installation of rigid foam board insulation as instructed by the Owner in areas where service pipe and/or water main is installed without proper cover or is installed within close proximity to sewer/storm manholes.

1.03 PAYMENT ITEMS

A. Items W1 to W3 - Ductile Iron Water Main

1. Method of Measurement: Linear feet as measured along the centerline of the pipe for the actual number of linear feet of pipe and fittings installed.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for pickup from Owner and delivery of pipe to job site, clearing, excavating, shoring and bracing, dewatering, fittings, bedding, laying and jointing, testing, removing and disposing of existing pipe and appurtenances that are being replaced, connections to existing mains and services that are remaining, select backfill, backfilling up to bottom of subbase gravel and compaction of placed materials and associated work as specified and shown on the Drawings. Separate payment shall be made for aggregate subbase gravel, aggregate base gravel, and Hot Mix Asphalts. Ductile iron water main and standard gaskets shall be provided by the Owner.

3. Schedule of Payment: Installation - 80%, Testing - 20%

B. Items W4 to W6 - HDPE Water Main

1. Method of Measurement: Linear feet as measured along the centerline of the pipe for the actual number of linear feet of pipe and fittings installed.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for clearing, excavating, shoring and bracing, dewatering, pipe, fittings, bedding, laying and

jointing, testing, removing and disposing of existing pipe and appurtenances that are being replaced, connections to existing mains and services that are remaining, select backfill, backfilling up to bottom of subbase gravel and compaction of placed materials and associated work as specified and shown on the Drawings. Separate payment shall be made for aggregate subbase gravel, aggregate base gravel, and Hot Mix Asphalts.

3. Schedule of Payment: Installation - 80%, Testing - 20%

C. Item W7 - PVC Water Main

1. Method of Measurement: Linear feet as measured along the centerline of the pipe for the actual number of linear feet of pipe and fittings installed.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for clearing, excavating, shoring and bracing, dewatering, pipe, fittings, bedding, laying and jointing, testing, removing and disposing of existing pipe and appurtenances that are being replaced, connections to existing mains and services that are remaining, select backfill, backfilling up to bottom of subbase gravel and compaction of placed materials and associated work as specified and shown on the Drawings. Separate payment shall be made for aggregate subbase gravel, aggregate base gravel, and Hot Mix Asphalts.

3. Schedule of Payment: Installation - 80%, Testing - 20%

D. Items W8 to W10 - Gate Valves (6-inch to 12-inch)

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, backfilling, sleeves (where required), valve box, select backfill, testing, and associated work as specified and shown on Drawings. Separate payment shall be made for aggregate subbase gravel, aggregate base gravel, and Hot Mix Asphalts. Gate valves shall be provided by the Owner.

3. Schedule of Payment: Installation - 100%

E. Item W11 - 4-inch Gate Valve

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, backfilling, valve, sleeves (where required), valve box, select backfill, testing, and associated work as specified and shown on Drawings. Separate payment shall be made for aggregate subbase gravel, aggregate base gravel, and Hot Mix Asphalts.

3. Schedule of Payment: Installation - 100%

F. Items W12 to W14 – Cut in Gate Valves (6-inch to 12-inch)

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, backfilling, valve, sleeves (where required), valve box, select backfill, testing, and associated work as specified and shown on Drawings. Separate payment shall be made for aggregate subbase gravel, aggregate base gravel, and Hot Mix Asphalts. Gate valves shall be provided by the Owner.

3. Schedule of Payment: Installation - 100%

G. Item W15 - Hydrant Assembly

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, hydrant tee, 6-inch hydrant control valve, valve box, 6-inch ductile iron pipe, hydrant, fittings, hydrant extensions (if required), removal and disposal of existing hydrant and appurtenances, thrust blocks, backfill, testing, cleanup (loam/seed and/or sidewalk restoration), and associated work as specified and shown on Drawings.

3. Schedule of Payment: Installation - 100%

H. Item W16 - Air Release Valves

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, valve, fittings, valve box, select backfill, backfilling, testing, cleanup, and associated work as specified and shown on Drawings.

3. Schedule of Payment: Installation - 100%

I. Items W17 to W23 - Copper Services

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, pipe, corporation, fittings, connection to existing service, service box, rod, curb stop, select backfill, backfilling, testing, cleanup (loam/seed and/or sidewalk/curb restoration), and associated work as specified and shown on Drawings.

3. Schedule of Payment: Installation - 100%

J. Items W24 to W25 - HDPE Services

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, pipe, corporation, fittings, connection to existing service, service box, rod, curb stop, select backfill, backfilling, testing, cleanup (loam/seed and/or sidewalk/curb restoration), and associated work as specified and shown on Drawings.

3. Schedule of Payment: Installation - 100%

K. Item W26 - PVC Services

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, pipe, tee, fittings, connection to existing service, service gate valve, select backfill, backfilling, testing, cleanup (loam/seed and/or sidewalk/curb restoration), and associated work as specified and shown on Drawings.

3. Schedule of Payment: Installation - 100%

L. Item W27 - Ductile Iron Services

1. Method of Measurement: Actual number installed

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, pipe, tee, fittings, connection to existing service, service gate valve, select backfill, backfilling, testing, cleanup (loam/seed and/or sidewalk/curb restoration), and associated work as specified and shown on Drawings.

3. Schedule of Payment: Installation - 100%

M. Item W28 - Gravel Borrow

1. Method of Measurement: Cubic yards as measured in place for the actual number of yards of gravel borrow installed.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, installation and compaction of gravel borrow as directed by the Owner to replace unsuitable excavated material.

3. Schedule of Payment: Installation - 100%

N. Item W29 - Unsuitable Material Excavated Below Pipe Grade

1. Method of Measurement: Cubic yard as measured in place prior to removal for the actual number of cubic yards excavated within the limits shown on the Drawings and directed by the Owner.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for removing unsuitable material excavated below trench grade and replacing with granular bedding material as directed by the Owner.

3. Schedule of Payment: Excavation - 100%

O. Item W30 - Rock Excavation

1. Method of Measurement: Cubic yard as measured in place prior to removal for the actual number of cubic yards excavated within the pay limits shown on the Drawings and directed by the Owner. Boulders less than two cubic yards in volume will not be measured for payment.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, excavation, select backfill replacement, erosion control, cleanup and associated work as specified and shown on the Drawings.

3. Schedule of Payment: Excavation - 100%

P. Item W31 - Aggregate Subbase Course Type D

1. Method of Measurement: Cubic yards as measured in place for the actual number of yards of Aggregate Subbase Course Type D installed.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for installation grading, and compaction of Aggregate Subbase Course Crushed (MDOT 703.06c) used for trench repair or as directed by the Owner.

3. Schedule of Payment: Installation - 100%

Q. Item W32 - Aggregate Base Course Type A

1. Method of Measurement: Cubic yards as measured in place for the actual number of yards of Aggregate Base Course Type A installed.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for installation grading, and compaction of Aggregate Base Course Crushed (MDOT 703.06a) used for trench repair or as directed by the Owner.

3. Schedule of Payment: Installation - 100%

R. Items W33 & W34 - Hot Mix Asphalt (HMA) [19MM and 9.5MM]

1. Method of Measurement: The volume will be measured in place for the actual quantity of paving installed within the pay limits within the trench repair areas indicated on the drawings. The total paving volume will be converted to weight in tons by the following formula for payment under these bid items:

Paving Area	X	Paving Thickness	X	0.06	=	Paving Weight
(square yards)		*(inches)*				*(tons)*

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for placing hot bituminous pavement, milling as required, and clean up and associated work as specified and shown on the Drawings. A price adjustment (up or down) based on the variance in costs for performance graded binder will be made for this item and calculated with the following formula (based on MDOT special provision section 108.)

Price adjustment = (# of tons) x (period price - base price) x [asphalt factor]

Base Price = The price of the PG binder liquid per ton that exists on the bid opening date

Period Price = The price of the PG binder liquid per ton that exists on the paving date that uses the New England Average Selling price.

% Asphalt factor = 5.2% for 19mm, 5.6% for 12.5mm and 6.2% for 9.5mm

Liquid prices are found at:

http://www.maine.gov/mdot/contractors/bidderinfo/asphalt.shtml

3. Schedule of Payment: Installation - 100%

S. Item W35 - Raised Sidewalk Reconstruction

1. Method of Measurement: Square yards as measured in place for the actual number of yards of raised sidewalk restored.

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for placing hot bituminous pavement as outlined in the associated detail, clean up, and associated work as specified and shown on the Drawings.

3. Schedule of Payment: Installation - 100%

T. Items W36 & W38 - Traffic Control Items

1. Method of Measurement: Lump Sum.

2. Basis of Payment: Payment of the lump sum prices established in the Bid shall be full compensation for providing work zone traffic control, traffic signs, construction signs, flaggers, and associated work as specified.

3. Schedule of Payment: Final Completion - 100%

U. Items W39 & W40 - Foreman & Laborer

1. Method of Measurement: Total hours.

2. Basis of Payment: Unit price per man-hour as stated in the Bid. Payment shall include wages, benefits and overhead and profit for personnel for the purpose of performing extra work at the request of the Owner.

3. Schedule of Payment: Completion of Work - 100%

V. Items W41 to W43 - Excavator, Loader, and Dump truck

1. Method of Measurement: Total hours.

2. Basis of Payment: Unit price per hour as stated in the Bid. Payment shall include equipment and operator/driver, wages, benefits, fuel and overhead and profit for the purpose of performing extra work at the request of the Owner.

3. Schedule of Payment: Completion of Work - 100%

PART 2 – PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

-- END OF SECTION --

Section 02537

Water Distribution System

PART 1 - GENERAL

1.01 SCOPE

A. This section includes the furnishing and installing of ductile iron and PVC water pipe and ductile iron or cast iron fittings as specified.

1.02 SUBMITTALS

A. Submit shop drawings for all material in accordance with the provisions of Section 01300.

PART 2 - PRODUCTS

2.01 GENERAL

A. Upon approval of the proposed Manufacturer and Product Series, the Contractor shall utilize that source for said material for the entirety of the Work unless otherwise approved by the Engineer to maintain consistency throughout the project.

B. Pipe delivered for construction shall be strung and protected so as to prevent entrance of any foreign material.

C. Any defective or imperfect materials furnished by the Contractor shall be marked as such and removed immediately from the site. Satisfactory materials shall be substituted for that rejected at no additional cost to the Owner.

D. All materials, products and coating that contact drinking water shall be certified to meet NSF/ANSI Standard 61 – latest revision, Drinking Water System Components – Health Effects.

2.02 ATTACHMENT HARDWARE

A. Stainless Steel: Type 304 – contains the addition of Molybdenum to the nickel-chromium steels.

B. High Strength/Low Alloy Steel: Trade name for cold formed T-head bolts containing alloying elements such as copper, nickel, and chrome (Cor-Blu).

2.03 CAST IRON OR DUCTILE IRON SPLIT REPAIR SLEEVE

A. Split repair sleeve shall be mechanical joint.

B. The side rubber gaskets shall be rectangular to cross-section and shall fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve.

C. Split repair sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.

D. Mechanical joint with accessories furnished; glands, gaskets and Cor-Blu T-bolts and nuts or equal.

E. All side bolts shall be Stainless Steel (Type 304) or silicone bronze.

F. Interior and exterior to be bituminous coated with a minimum of 4 mils D.F.T.

G. The sleeve shall be provided with a 2-inch F.I.P.T. test port with brass plug.

2.04 CORPORATION STOP

A. Conforming to AWWA C-800.

B. 3/4-inch to 2-inch curb stops shall be ball valve design with brass ball that is Teflon coated or brass ball with Teflon seats.

C. The ball shall be supported by seats which are water tight in either direction.

D. The valve shall have a full port opening.

E. The body of the corporation stop shall be of heavy-duty design.

F. The valve working pressure shall be 300-psi.

G. Approved Manufacturers:

1. A.Y. McDonald

2. Cambridge Brass

3. Ford Meter Box Co.

4. Mueller Co.

2.05 CURB STOP

A. Conforming to AWWA C-800.

B. 3/4-inch to 2-inch curb stops shall be ball valve design with brass ball that is Teflon coated or brass ball with Teflon seats.

C. The ball shall be supported by seats which are water tight in either direction.

D. The valve shall have a full-port opening.

E. The valve shall open with 1/4 turn (90°) with a check or stop.

F. The valve shall not have a drain.

G. The valve stem shall have 2 “O” rings and a bronze ring lock which holds the stem solidly in the valve body.

H. The valve body shall be of heavy-duty design.

I. The valve working pressure shall be 300-psi.

J. Approved Manufacturers:

1. A.Y. McDonald

2. Cambridge Brass

3. Ford Meter Box Co.

4. Mueller Co.

2.06 CUT-IN SLEEVE

A. The sleeve shall be mechanical joint to plain-end type.

B. The sleeve shall fit over either AB or CD pattern pipe.

C. Interior coating– Seal-coated – AWWA C104-74, min. 4 mils D.F.T.

D. Exterior coating – Bituminous coated, min. 4 mils D.F.T.

E. Mechanical joint connections

1. Glands: Duck-tipped for AB pipe, Plain Gaskets for CD pipe

2. Cor-Blu tee bolts and nuts

F. Cut-in sleeves shall have at least one stop-screw in sizes up through 10-inch and at least 2 stop-screws in 12-inch size.

G. The stop-screw “O” ring shall be recessed into the body of the sleeve between stop-screw and body.

H. Approved Manufacturers

1. Mueller Co.

2.07 DUCTILE IRON FITTINGS

A. Fittings include but are not limited to bends, reducers, off-sets, tees and sleeves.

B. Material shall be ASTM A536 latest, grade 70-50-05, in accordance with AWWA C110 (latest revision) for fittings larger than 24-inch and C153 (latest revision) for fittings 3-inch through 24-inch.

C. Fittings shall be cement lined AWWA C104 (latest revision) or fusion bonded epoxy coated with a 5-mil nominal thickness per AWWA C550 and C116.

D. Interior seal coated AWWA C104 with minimum of 4 mils dry film thickness.

E. Exterior bituminous coated, 4 mils minimum dry film thickness or fusion bonded epoxy coated with a 5-mil nominal thickness per AWWA C550 and C116.

F. Sleeves shall not be cement lined, but shall be bituminous coated inside to 4 mils dry film thickness. All sleeves shall be long body type.

G. Mechanical joint with accessories furnished: D.I. glands, gaskets, Cor-Blu T-bolts and nuts

H. Class 350 pressure rating in accordance with AWWA C153 - 3-inch - 24-inch sizes.

I. Class 250 pressure rating in accordance with AWWA C110 - 30-inch - 48-inch sizes.

J. The "compact design" fittings must provide adequate space for the MJ joint and accessories to be installed without special tools (i.e., Lowell wrench can be used).

2.08 DUCTILE IRON PIPE

A. Ductile iron pipe shall meet requirements of AWWA Standard C-151 (latest revision) and be cement lined and seal coated to meet AWWA Standard C-104 (latest revision).

B. Joints shall meet requirements of AWWA C-111 (latest revision).

C. Interior seal coated, bituminous paint oil cut, emulsion not acceptable, thickness minimum of 2 mils dry film thickness.

D. Exterior bituminous coated with minimum of 2 mils dry film thickness.

E. Class 52 wall thickness, 4-inch diameter through 12-inch diameter inclusive.

F. Ductile Iron Pipe with diameters 16-inches and larger shall be approved by the Owner.

G. State nominal laying length and mark shorter lengths near bell.

H. Mechanical joint pipe to be furnished with gland, gaskets and Cor-Blu T-bolts and nuts.

I. Approved Manufacturers

1. American Cast Iron Pipe

2. U.S. Pipe

2.09 FIRE HYDRANT

A. The hydrant shall open right.

B. Operating nut shall be DI or bronze, pentagon in shape with dimensions:

1. Top 1-13/16-inch tapering to 1-7/8-inch on bottom

C. Nozzles:

1. Two (2) each: 2-1/2-inch National Standard Thread

2. One (1) each: 4-1/2-inch National Standard Thread

D. Port covers shall be supplied without chains and shall have the same size pentagon operator as specified in 3.0(b) above.

E. Traffic model hydrant with breakaway feature.

F. Barrel Length

1. 6 ft. cover, 6.5 ft. bury; or

2. 5.5 ft. cover, 6 ft. bury; or

3. 5 ft. cover, 5.5 bury

G. Hydrant shoe or base shall have 6-inch MJ inlet and 5-1/4-inch valve opening with non-draining bronze seat that is permanently plugged. Valve seat and sub-seat arrangement shall be bronze to bronze. Horizontal and vertical blocking planes manufactured into hydrant base.

H. Bolts

1. All buried mechanical joint bolts and nuts (T-head, etc.) shall be Cor-Blu or equal

2. All buried flange joint bolts shall be stainless steel (Type 304) or silicone bronze

I. Protective Coatings

1. All paintings and coatings shall be a minimum of 3 mils total dry film thickness, unless noted

2. The internal area of the hydrant base, which is normally exposed to water and which includes the internal body of hydrant shoes, including lower valve plate, shall be epoxy coated

3. All internal and external cast iron or ductile iron components shall be coated with an approved bituminous coating, 3 mils minimum.

4. Coatings for upper barrel - exterior:

a. Surface preparation blast clean SSPC-SP-6

b. Primer Sherwin Williams Red Oxide E61RC21, 1.5 mils, dry

c. Finish coat Sherwin Williams – Regal Yellow, F78Y30, 1.5 mils, dry or sufficient paint to hide the second coat

d. Total dry film thickness - 3 mils minimum

5. Coatings for bonnet, operating nut, port cap:

a. Surface preparation: Blast clean, SSPC-SP-6

b. Exterior primer

c. Exterior aluminum

d. Total dry film thickness: 3 mils minimum.

J. The Owner shall install flow indicator collars on all new hydrants.

K. Approved Hydrants:

1. Clow Eddy – with lower stern machined from bar stock

2. American Darling Models: B62B-1, B62B-5

2.10 HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

A. HDPE pipe shall be manufactured in accordance with AWWA C906. This material shall have a long-term Hydrostatic Strength of 1600 psi when tested in accordance with ASTM D2837. HDPE shall be manufactured from PE 4710 polyethylene compounds that meet or exceed ASTM D3350 cell classification 445574. The manufacturer shall comply with NSF Standard 61 and/or Standard 14 and must be certified by the NSF International for potable water.

B. The pipe and fittings shall have a Standard Dimension Ratio (SDR) of 11 and be rated for a working pressure of 200 psi at a temperature of 75 degrees Fahrenheit with a service life of 50 years. All pipe and fittings shall be ductile iron pipe size.

2.11 PIPE JOINT RESTRAINT

A. Use in conjunction with mechanical joint fittings.

B. The joint restraint ring and its wedging components shall be made of ductile iron conforming to ASTM A536-80.

C. Dimensions of the restrainer must allow use with standard M.J. bell conforming to AWWA C111 and AWWA C153.

D. Restrainer must restrain up to 350-psi of working pressure in 3-inch to 16-inch sizes and 250-psi of working pressure in 18-inch to 48-inch sizes with a 2:1 safety factor.

E. Torque limiting twist off nuts shall be used to ensure proper actuation of the restraining wedges where applicable.

F. Approved Manufactures

1. Sigma ONE-LOK

2. Ford Uni-Flange Series 1400

3. EBAA Mega Lug

4. Romac Grip Ring

5. Star Grip Series 300

6. Romac Romagrip

7. MJ FIELD LOK Gasket

2.12 POLYETHYLENE ENCASEMENT

A. Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A.

B. Polyethylene encasement shall be either linear low-density polyethylene (LLDPE) film with a minimum thickness of 8-mil or high-density, cross-laminated polyethylene (HDCLPE) film with a minimum thickness of 4-mil.

C. Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.

D. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.

E. The polyethylene film shall be fitted to the contour of the pipe to affect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.

F. Three layers of polyethylene adhesive tape shall be wrapped around any polywrapped pipe where a tapping machine will be placed. All copper services connected to a pipe wrapped in polyethylene encasement shall be wrapped within three feet of the pipe.

2.13 PVC PIPE

A. Pipe shall be AWWA C-900 Pressure Class 305-psi (SDR-14).

B. The pipe shall conform to standard ASTM 2241.

C. The pipe shall be provided in 20-foot lengths. If approved by the Engineer, field cutting per Manufacturer’s recommended practices.

D. The gasket or O-Ring material shall be rubber meeting ASTM F 477 and of the “permanent use” type.

E. Where pipe slip joints are called to be restrained, restrained joint gaskets shall be internally installed from the manufacturer.

F. All small diameter service connections shall be made with tapping saddles.

G. Tracer wire and marking tape shall be installed along the length of the main.

H. Approved Manufacturers:

1. J-M Manufacturing - Blue Brute

2. Certainteed – Yelomine

3. Victaulic – Aquamine

4. IPEX – Blue Brute

2.14 RESILIENT SEATED GATE VALVE

A. Valve shall meet the latest revision of the AWWA C-515 and AWWA C-509 standards for 4-inch diameter valves and larger and 2-inch diameter valves, respectively.

B. Valve shall have a smooth unobstructed water way which shall be a minimum diameter of the valve.

C. Valve ends to be specified and shall be furnished with Cor-Blu (or equal) T-bolts and nuts.

D. Valve shall be rated for zero leak rate at 200-psi differential working pressure and have a 400-psi hydrostatic test for structural integrity.

E. Sealing - Valve shall have a minimum of 2 “O” rings situated such that the “O” rings above the thrust collar can be replaced with the valve under pressure and in the open position.

F. Valve stem shall:

1. open right with a stem nut made of copper-alloy

2. non-rising

3. include a thrust collar integrally cast to the stem

4. include with two (2) thrust washers, placed one above and one below the stem thrust collar

5. constructed of copper-alloy or stainless steel

6. such that the thrust washers are made of a synthetic polymer with physical properties required or stainless steel

G. The body, including the stuffing box and the bonnet, shall be constructed of cast iron or ductile iron, meeting the latest revision of AWWA C-153

H. Wedge shall be constructed of ductile iron (less guiding mechanism), fully encapsulated and permanently bonded with a resilient elastomer, constructed such to allow the flushing of any interior exposed surface during operations.

I. Coatings

1. the internal and external valve body, including the stuffing box, bonnet, and interior of the wedge shall be fusion bonded epoxy coated with 8 mils D.F.T.

2. interior shall meet latest version of AWWA C-550

3. shall be holiday free, interior and exterior, per testing method described in AWWA C-550, Sec. 5.1

J. Operating nut shall be two inch (2-inch) square gray iron or ductile iron with a hold down nut (made of 316 stainless steel or silicone bronze), for tapered stems. Or, a stainless-steel pin inserted through the stem for full diameter stems.

K. Bolts – The seal plate and bonnet bolts shall be stainless steel (Type 316 or Type 304)

L. Valves 12-inch nominal diameter and smaller shall be directly operated by the nut on the valve stem and mounted vertically. Number of turns to open or close shall match the formula: (3 x D) + 2 within +/- 2 turns. For example, a 12-inch valve should open or close with (3 x 12) + 2 = 38 turns of the operating nut.

M. Valves larger than 12-inch nominal diameter shall be designed to be installed horizontally and shall have bevel gear operators driven by the operating nut. Valves 14-inch – 24-inch nominal diameter shall have 4:1 bevel gear operators. Valves with 30-inch – 36-inch nominal diameters shall have 6:1 bevel gear operators and valves with 42-inch – 48-inch nominal diameters shall have 8:1 bevel gear operators. Number of turns to open or close shall match the formula: ((3 x D) + 2) times the bevel gear ratio within +/- 4 turns. For example, a 24-inch valve should open or close with approximately ((3 x 24) + 2) x 4 = 296 turns of the operating nut.

N. Contractor may be required to supply a valve for inspection and approval of the coating system.

O. Approved Manufacturers (4-inch diameter and larger)

1. AFC Series 2500

2. Mueller A-2361/62

3. Clow Model 2638

P. Approved Manufacturers (2-inch diameter)

1. Mueller A-2361/62

2. Clow Model 2639/2640

2.15 RESTRAINED JOINT GASKETS

A. accepted restrained joint gaskets in the Portland Water District distribution system shall be rated in accordance with the performance requirements of ANSI/AWWA C111/A21.11.

B. Required applications:

1. Any hydrant branch or service with a distance greater than 18-foot shall have an approved restrained joint gasket in the bell ends.

2. Where a casing is required, all joints within the casing shall have an approved restrained joint gasket unless restrained joint pipe is used.

3. At any time as required by the Owner or Engineer.

4. Any live service tap where there is a joint between the connection and the end of the service

C. Approved Manufacturers

1. American Fast-Grip Gasket – American Pipe

2. Field Lok 350 Gasket – US Pipe

2.16 SERVICE BOX AND ROD

A. Service box

1. Shall be 1.0-inch Schedule 40 steel pipe with top having 1.0-inch N.P.T. pipe threads for screw-on cover or coupling.

2. Shall be Erie style with 6-foot slide-type riser.

3. Any extension of a service box requires a threaded merchant coupling with no set screw.

4. Approved Manufacturers: Laroche, Clow Canada, Bibby

B. Cover

1. Shall be Quincy type (heavy duty) cover that screws on Service Box (1.1 above)

2. Shall be tapped with a 1-inch rope thread with a solid brass plug with pentagon operating head

3. Approved Manufacturers: Bibby, Laroche, Clow Canada, QWP

C. Service box foot piece

1. The standard foot piece shall be heavy duty (Ford style or equal) cast iron design.

2. The large, heavy-duty foot piece shall have an arch that will fit over 2-inch ball-valve curb stops

3. Approved Manufacturer: Laroche

D. Service Rod

1. Shall have a self-aligning design

2. 36-inch length for all services

3. 24-inch length for air valves

4. Shall be round and constructed of stainless steel (304) with an epoxy coating (minimum 4 mil D.F.T.)

5. Shall have a yoke design that is an integral part of the rod

6. The curb-stop attachment pin shall be a brass cotter pin

7. The rod “wrench-flat” shall have a minimum thickness of 1/4-inch tapered to 1/16-inch and width of 5/8-inch or 1/2-inch.

8. Diameter:

   a. 1/2-inch for 1/2-inch, 3/4-inch, and 1-inch services

   b. 5/8-inch diameter for 1.5-inch and 2-inch services

9. Approved Manufacturer: North American Manufacture

2.17 SERVICE SADDLE

A. GENERAL

1. The saddle body shall be constructed of epoxy coated ductile iron.

2. The sealing gasket(s) shall be either Buna-N rubber or SBR rubber (ASTM D2000).

3. Service saddles shall be of a CC tap type.

B. PVC MAIN REQUIREMENTS

1. Service saddles installed on PVC mains shall have stainless steel straps.

C. HDPE MAIN REQUIREMENTS

1. Service saddles installed on HDPE mains shall have spring washers.

D. Approved Manufacturers:

MAIN TYPE	MAIN SIZE	TAP SIZE	APPROVED SADDLES
CAST & DI	4-inch - 12-inch	1.5-inch	Smith-Blair 313 Smith-Blair 331
CAST & DI	4-inch - 12-inch	2-inch	Smith-Blair 313
CAST & DI	16-inch	1.5-inch & 2-inch	Smith-Blair 313
CAST & DI	20-inch - 36-inch	1.5-inch & 2-inch	Smith-Blair 366
PVC	2-inch	3/4-inch & 1-inch	Smith-Blair 315 Smith-Blair 317 Smith-Blair 397
PVC	4-inch - 12-inch	3/4-inch - 2-inch	Smith-Blair 317 Smith-Blair 397
HDPE	2-inch	3/4-inch & 1-inch	Smith-Blair 317
HDPE	4-inch - 12-inch	3/4-inch - 2-inch	Smith-Blair 317

2.18 STAINLESS STEEL REPAIR CLAMP

A. The sleeve shall be of full circle design, either one piece or two pieces, for pipe sizes 2-inch through 12-inch

B. Body: Shall be 18-8 stainless steel shell.

C. Gasket: Shall be full length and diameter of the body size. This gasket shall form a multiple O-ring, or grid, sealing barrier for the entire length and circumference. Shall be virgin SBR rubber (ASTM D2000 AA 415)

D. Lugs, sidebar, and lifting bar shall be heavy gauge 18-8 stainless steel with TIG/MIG welding and chemical passivation of all welds.

E. Bolts and Nuts shall be Teflon coated 18-8 heavy gauge stainless steel.

F. Armor: The armor, or bridging plate between the side bars shall be heavy gauge 18-8 stainless steel bonded to the gasket to bridge the lug area.

2.19 TAPPING SLEEVE

A. For sizes 12-inch and smaller tapping sleeve shall be ductile iron, stainless steel, or approved fabricated steel.

1. Tapping sleeve shall be mechanical joint with recessed outlet flange for tapping valve.

2. Tapping sleeve shall conform to AWWA C-207, Class D, with rated maximum working pressure of 200-psi.

3. The side rubber gaskets shall be rectangular in cross-section and fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve and shall not require cutting or trimming to match MJ end gaskets.

4. Tapping sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.

5. Mechanical joint with accessories furnished; glands, gaskets, and Cor-Blu T-bolts and nuts or equal.

6. All flange outlet bolts shall be stainless steel (Type 304).

7. Interior and exterior to be bituminous coated with a minimum of 4 mils dry film thickness or fusion bonded epoxy coated.

8. The sleeve shall be provided with a 3/4-inch F.I.P.T. test port and brass lug.

9. Approved Manufacturers

a. AFC

b. Mueller Co.

c. US Pipe

d. Tyler / Union

e. Powerseal Model 3490 and 3490 MJ (Fabricated Steel)

f. Romac SST

B. For sizes 16-inch and larger tapping sleeve shall be fabricated steel:

1. Body and Flange - A-36

2. Coating - Fusion-bonded epoxy coating with minimum D.F.T. of 5 mils, inside and out

3. Bolts, Nuts - Stainless Steel (Type 304)

4. Gaskets – SBR

5. Flange - AWWA Class D plate flange with ANSI 150# drilling, proper recessing for tapping valves

6. Sleeves shall be provided with 3/4-inch F.I.P.T. test port and plug

7. Approved Manufacturers

a. Romac FTS 420

b. Ford FTSC

c. Smith Blair 622

d. JCM 412

e. Powerseal Model 3490 and 3490 MJ (up to 24-inch)

f. JCM 415 or approved equal (for RCCP pipe only)

2.20 TRACER WIRE & MARKING TAPE

A. Water Main Marking Tape

1. Lineguard III by Tri-Sales, Inc., 2" wide, green; detectable with magnetic locators, or approved equal.

B. Tracer Wire

1. Copperhead Industries part number 1230-SF, or approved equal.

C. Tracer Wire Splice Kits:

1. 3M Brand DBR Direct Bury Splice Kit, or approved equal.

D. Grounding Rod

1. Copperhead 1-lb, Drive-In Magnesium anode (part number ANO-1005 with part number SCB-01SR Connector), or equal.

2.21 VALVE BOX

A. General

1. Material shall be cast iron or ductile iron free from defects.

2. Interior and exterior of all components shall be bituminous coated with a minimum of 4 mils dry film thickness.

3. The minimum total length of valve box top and bottom sections shall be as follows:

a. Projects in Windham, Raymond, Standish: 78-inches.

b. Projects in all other municipalities: 72-inches.

4. Valve boxes shall be two (2) piece sets (i.e., top and bottom section).

5. Valve box sections and cover shall be round.

6. Valve box sections shall be of a slide or slip design.

7. Valve box bottom sections are not required to be of the same manufacturer as the top section.

8. Valve box top section and cover must be of the same manufacturer.

B. Valve Box Bottom-Section

1. The valve box bottom section shall have a bell-type base with bottom lip and have an inside diameter between 5-inches and 5.5-inches.

2. Approved manufacturers:

a. Bibby St-Croix

b. EJ

c. Bingham & Taylor

d. Tyler Union

e. Sigma

f. General Foundries

C. Valve Box Top-Section

1. The valve box top section shall not have a top flange or “bead” or bottom flange and have an inside diameter of between 6-inches and 6.5-inches measured from the base.

2. Approved manufacturers:

    a. Bibby St-Croix

    b. EJ

    c. Bingham & Taylor

    d. Sigma

    e. General Foundries

D. Valve Box Cover

1. The valve box cover shall be a drop-type design and have a 2-inch depth.

2. The word ‘water’ shall be cast into the cover

3. Approved manufacturers:

    a. Bibby St-Croix

    b. EJ

    c. Bingham & Taylor

    d. General Foundries

PART 3 - EXECUTION

3.01 PIPE LAYING CONDITIONS

A. Pipe shall not be laid in water, or when trench conditions or weather conditions are unsuitable for such work.

B. The interior of each pipe shall be inspected while being joined to see that the alignment is preserved and to assure that no dirt or debris has entered the pipe after laying and partial backfilling.

C. Pipe fittings and accessories shall be carefully lowered into the trench, piece by piece, by means of derrick, crane, slings and other suitable tools and equipment, in a manner such as to prevent damage to the material or to its protective coating and linings. No chain or slings shall be passed through the inside bore of any pipe or valve or fitting. Under no circumstances shall piping materials be dropped or dumped into the trench.

3.02 LAYING DUCTILE IRON & PVC PIPE

A. As soon as the excavation is completed and the existing trench bottom has been brought to the proper grade, the pipe shall be laid.

B. All pipe, before being lowered into the trench, shall be inspected inside and out. Both ends shall be cleaned and any visible dirt or debris removed from inside the pipe and the interior of all

affected pipe and fittings shall be swabbed with a 5% hypochlorite solution immediately before they are installed. Care shall be taken to lay the pipe to true lines and grades as shown on the drawings.

C. Coupling holes shall be excavated so that the barrel of the pipe shall bear upon the trench bottom.

D. Blocking under the pipe will not be permitted.

E. Each section shall rest upon the pipe bed for the full length of its barrel.

F. The circular rubber gasket shall be inserted in the gasket seat provided. A thin film of gasket lubricant shall be applied to the inside surface of the gasket. Gasket lubricant shall be a solution of vegetable soap or other solution supplied by the pipe manufacturer.

G. The spigot end of the pipe shall be cleaned with an approved soap solution and entered into the rubber gasket in the bell, using care to keep the joint from contacting the ground. The joint shall then be completed by forcing the plain end to the seat of the bell. Pipe which is not furnished with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint.

H. Pipe shall be aligned with the preceding unit and laid so as to form a close joint with the adjoining pipe and bring the inverts continuously to the required line and grade.

I. No length of pipe shall be laid until the previous length has had sufficient material tamped about it to firmly secure it in place so as to prevent any movement or disturbance.

J. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work, except by permission of the Engineer.

K. The pipe shall be laid with the bell ends facing the direction of the laying, unless otherwise permitted by the Engineer.

L. Joints, when made, shall be done in the manner prescribed by the manufacturer of the pipe. In the case of rubber gasket joints, these joints shall be made up in accordance with the American National Standards for the jointing of cast iron pressure pipe and fittings. (ANSI/AWWA C111/A21.11).

M. Joints of all pipes in the trench shall be completed before work is stopped; and all openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day’s work or for other reasons.

N. Thrust blocks shall be used behind tees, bends, or other fittings where shown. Size shall be appropriate for soil conditions and thrust forces acting on the specific fitting.

3.03 TRENCH BOTTOM

A. Should the trench bottom contain unsuitable material, as indicated in Section 02217, Article 3.2-b, the Contractor shall over-excavate and replace with bedding material as required and authorized by the Engineer. The quantity of unsuitable material will be measured from the bottom outside of the pipe.

B. Should ledge be encountered, it shall be removed to a depth of 6-inch below the bottom of the pipe, and replaced with bedding material.

3.04 CUTTING PIPE

A. All ductile iron pipe and PVC shall be cut using abrasive wheel cutter, rotary wheel hand cutter (with carbide cutter) or a guillotine pipe saw. All cuts shall be square and even with no ragged rough ends.

B. Field cut pipe lengths shall be beveled and filed to avoid damage to the gasket and facilitate making the joint.

C. When the cut end of pipe is to be used as a joint, the outside of the cut end shall be tapered back about 1/8-inch at an angle of about 30 degrees with the center line of the pipe. This shall be done with a coarse file or a portable grinder.

3.05 TEMPORARY PLUGS

A. When pipelaying is not actually in progress, the openings of pipes shall be closed by temporary watertight plugs or other accepted means.

3.06 RETAINER GLANDS

A. Install retainer glands on all mechanical joints of fittings, valves and hydrants.

3.07 POLYETHYLENE ENCASEMENT

A. Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A. Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.

B. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.

C. The polyethylene film shall be fitted to the contour of the pipe to affect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.

3.08 FIELD TEST OF INSTALLED HYDRANT

A. Hydrant flow shall completely stop with no more than 200 ft. lb. of torque applied to the operating nut.

B. Failure to shut completely at no more than 200 ft. lb. of torque will be cause for rejection of that hydrant.

3.09 VALVE BOX INSTALLATION

A. Valve boxes shall be installed centered on the valve.

B. Valve boxes shall be installed level such that the valve may be operated when the trench is back-fill and when pavement is installed.

C. Valve box top and bottom sections shall have a minimum of six (6) inches of overlap between the two sections when installed.

D. Contractor shall determine the length of valve box top and bottom sections based on field conditions (e.g., if the valve is installed deeper than the plan due to a utility conflict, a taller top or bottom section may be required).

1. Multiple valve box bottom sections may not be stacked to provide sufficient height.

3.010 TAPPING SADDLE INSTALLATION

A. DUCTILE IRON & CAST IRON MAIN REQUIREMENTS

1. Service saddles shall be used for all new 1.5-inch and 2-inch services on ductile iron water mains.

2. Service saddles shall be used for all 2-inch non-service connections to existing ductile iron or cast iron water mains (e.g., temporary main connections).

B. PVC MAIN REQUIREMENTS

1. Service saddles shall be used for all new 1-inch, 1.5-inch, and 2-inch services on PVC water mains.

2. Service saddles shall be used for all 2-inch non-service connections to existing PVC mains (e.g., temporary main connections).

C. HDPE MAIN REQUIREMENTS

1. Service saddles shall be used for all new 1-inch, 1.5-inch, and 2-inch services on HDPE water mains.

2. Service saddles shall be used for all 2-inch non-service connections to existing HDPE mains (e.g., temporary main connections).

3.011 TRACER WIRE & MARKING TAPE INSTALLATION

A. Warning Tape

1. Install warning tape continuously along the PVC/HDPE water main. At ends of rolls and repairs, splice tape with 3-foot overlap connected with duct tape. Tape should be installed at a depth of two (2) feet above the water main.

B. Tracer Wire

1. Install tracer wire continuously between each end of the PVC/HDPE water mains. It shall be installed in the same trench as the pipe and secured to the pipe as required to ensure the wire remains adjacent to the pipe.

2. Tracer wire shall be grounded at all ends of the wire by connecting the wire to an approved waterproof connection to a grounding anode, buried at the same depth as the tracer wire.

3. Tracer wire shall be installed up through a valve box at each end of the PVC/HDPE water main. The wire shall accessible by hand from the surface, and shall be installed with enough slack to allow for adjustments to the elevation of the valve box for paving.

    a. At the point of connection between existing conductive pipes where there is not a valve box installed, the tracer wire shall not be connected to the iron pipe.

3.012 TRACER WIRE TESTING

A. After trench backfill is completed, perform continuity and trace tests on all tracer wire in the presence of the Owner. If the tracer wire is found to be not continuous after testing, the Contractor shall repair or replace the failed segment of wire. The Contractor shall be responsible for all costs to confirm, locate, and repair any breaks in the tracer wire identified during testing.

3.013 INSTALLATION OF HIGH DENSITY POLYETHYLENE (HDPE) PIPE

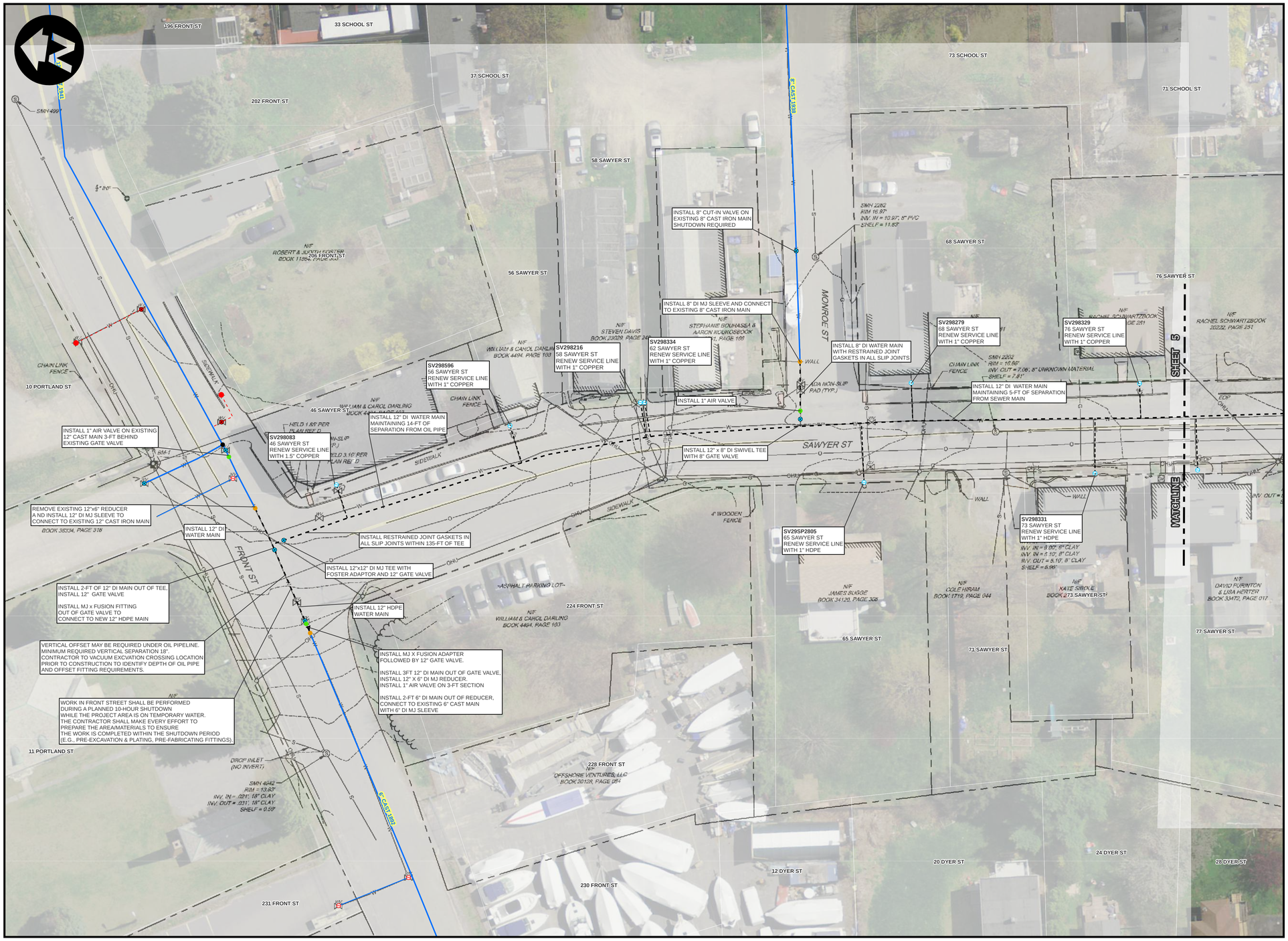
A. The HDPE pipe sections shall be joined on the job site using heat fusion methods. Transitions to other pipe materials shall be via heat fused polyethylene stub ends connected to an HDPE mechanical joint adaptor.

B. All heat fused joints shall be made by qualified personnel of the pipe supplier. The Contractor shall be responsible for scheduling, coordination and all costs associated with the pipe jointing.

C. Joining pipe lengths shall be performed using equipment specifically designed for heat fusion of polyethylene pipe of the sizes specified. The equipment shall have a trimming mechanism to produce a clean, flush surface perpendicular to the pipe wall at all joints and a Teflon coated heating plate to prevent adhesion of the pipe to the plate. Pipe ends shall be clean and free of polyethylene trimmings, dirt or other deleterious material prior to fusing.

D. The heat fusion process shall be performed in full accordance with the pipe manufacturer's recommendations. Pipe joining equipment shall monitor pressure and heating plate temperature to insure proper jointing.

-- END OF SECTION --



PROPOSED MAINS

NOTES

1. CONTRACTOR SHALL DISPOSE OF ALL EXCAVATED PIPING AND APPURTENANCES. SALVAGE ALL REMOVED HYDRANTS AND DELIVER TO PWD YARD AT 225 DOUGLASS ST - PORTLAND.

2. ALL MAINS AND SERVICES SHALL BE INSTALLED WITH 5.5' OF COVER MEASURED FROM PROPOSED ROAD GRADE UNLESS INDICATED OTHERWISE ON THE DRAWINGS OR APPROVED BY A PWD REPRESENTATIVE.

3. THE PORTLAND WATER DISTRICT WILL NOTIFY CUSTOMERS FOR ALL WORK INVOLVING TEMPORARY SHUTDOWN OF SERVICE. CUSTOMERS MUST RECEIVE AT LEAST 48 HOURS NOTIFICATION PRIOR TO ANY SHUTDOWN. THE DISTRICT MUST RECEIVE NOTICE FROM THE CONTRACTOR OF THE SHUTDOWN AT LEAST 4 DAYS PRIOR TO THE PROPOSED SHUTDOWN.

4. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE POLY-WRAPPED PER SPECIFICATIONS.

5. ALL TEMPORARY WATER TO BE BURIED BELOW GRADE AT DRIVEWAYS AND ROAD WAYS.

6. REMOVE ALL OLD PIPING NOT EXPLICITLY CALLED OUT FOR ABANDONMENT.

7. REPLACE ALL SERVICES TO BE RENEWED FROM MAIN TO STREET LINE WITH 1" COPPER PIPING, UNLESS OTHERWISE NOTED.

8. LOCATIONS OF UTILITIES OTHER THAN WATER ARE APPROXIMATE, AND NOT ALL UTILITIES ARE SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, SUPPORTING AND PROTECTING ALL UTILITIES DURING INSTALLATION OF THE WATER MAIN.

9. INSTALL SWIVEL TYPE TEES FOR ALL HYDRANT CONNECTIONS.

10. A SHUTDOWN INCLUDING CUSTOMER NOTIFICATION IS REQUIRED FOR INSTALLATION OF ALL CUT-IN VALVES AND FITTINGS ON EXISTING WATER MAINS.

11. ALL FITTINGS SHALL BE MECHANICAL JOINT (RETAINED).

12. REMOVE THE TOP SECTION OF ALL ABANDONED VALVE BOXES AND FILL WITH SAND.

13. INSTALL A MECHANICAL JOINT CAP ON ENDS OF ALL ABANDONED MAINS.

14. WATER SERVICE PIPING SHOULD RUN OVER OR UNDER THE SEWER WITH A MINIMUM OF 12-INCH VERTICAL SEPARATION UNLESS APPROVAL FOR ALTERNATE INSTALLATION IS PROVIDED BY PWD.

0 10 20 40 60 US Feet

SCALE: 1 IN = 20 FT

LEGEND

- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- TEMPORARY WATER MAIN
- PROPOSED/RENEWED SERVICE
- RECONNECT SERVICE

PROJECT: 457046

SAWYER STREET FRONT STREET TO BROADWAY WATER MAIN REPLACEMENT SOUTH PORTLAND, MAINE

DATE: 12/21/2023
REV 1 DATE: 1/22/2024
REV 2 DATE:

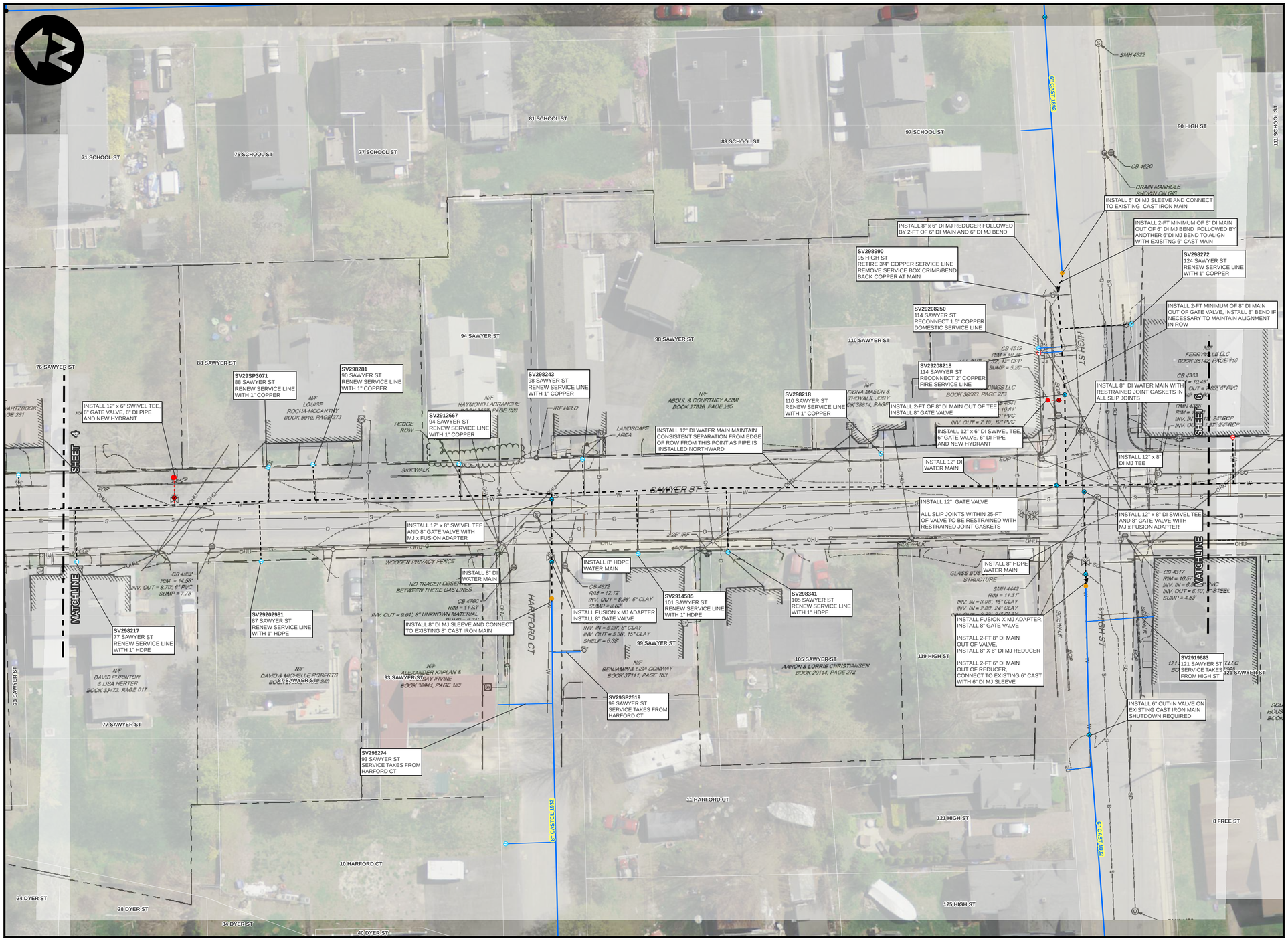
DESIGN BY: AHS

DRAWN BY: BSJ

225 Douglass Street
PO Box 3553
Portland, Maine 04104

Portland Water District
From Sebago Lake to Casco Bay

SHEET: W4



PROPOSED MAINS

NOTES

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4. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE POLY-WRAPPED PER SPECIFICATIONS.

5. ALL TEMPORARY WATER TO BE BURIED BELOW GRADE AT DRIVEWAYS AND ROAD WAYS.

6. REMOVE ALL OLD PIPING NOT EXPLICITLY CALLED OUT FOR ABANDONMENT.

7. REPLACE ALL SERVICES TO BE RENEWED FROM MAIN TO STREET LINE WITH 1" COPPER PIPING, UNLESS OTHERWISE NOTED.

8. LOCATIONS OF UTILITIES OTHER THAN WATER ARE APPROXIMATE, AND NOT ALL UTILITIES ARE SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, SUPPORTING AND PROTECTING ALL UTILITIES DURING INSTALLATION OF THE WATER MAIN.

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0 10 20 40 60 US Feet

SCALE: 1 IN = 20 FT

LEGEND

- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- TEMPORARY WATER MAIN
- PROPOSED/RENEWED SERVICE
- RECONNECT SERVICE

PROJECT:
457046

SAWYER STREET
FRONT STREET TO BROADWAY
WATER MAIN REPLACEMENT
SOUTH PORTLAND, MAINE

DATE: 12/21/2023
REV 1 DATE: 1/22/2024
REV 2 DATE:

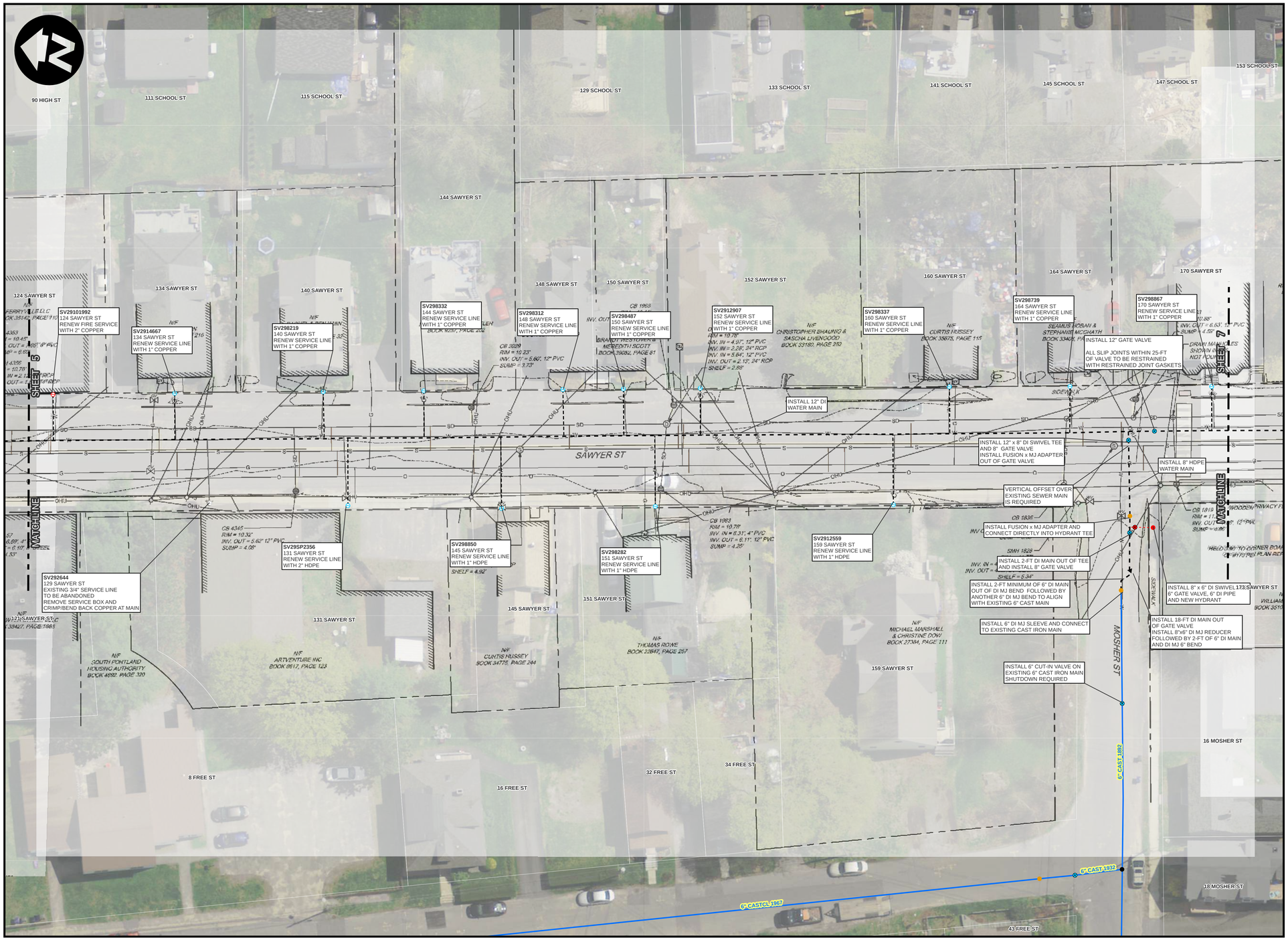
DESIGN BY: AHS

DRAWN BY: BSJ

225 Douglass Street
PO Box 3553
Portland, Maine 04104

Portland Water District
From Sebago Lake to Casco Bay

SHEET:
W5



PROPOSED MAINS

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1. CONTRACTOR SHALL DISPOSE OF ALL EXCAVATED PIPING AND APPURTENANCES. SALVAGE ALL REMOVED HYDRANTS AND DELIVER TO PWD YARD AT 225 DOUGLASS ST - PORTLAND.

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SCALE: 1 IN = 20 FT

LEGEND

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- TEMPORARY WATER MAIN
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- RECONNECT SERVICE

PROJECT:
457046

SAWYER STREET
FRONT STREET TO BROADWAY
WATER MAIN REPLACEMENT
SOUTH PORTLAND, MAINE

DATE: 12/21/2023
REV 1 DATE: 1/22/2024
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DESIGN BY: AHS

DRAWN BY: BSJ

225 Douglass Street
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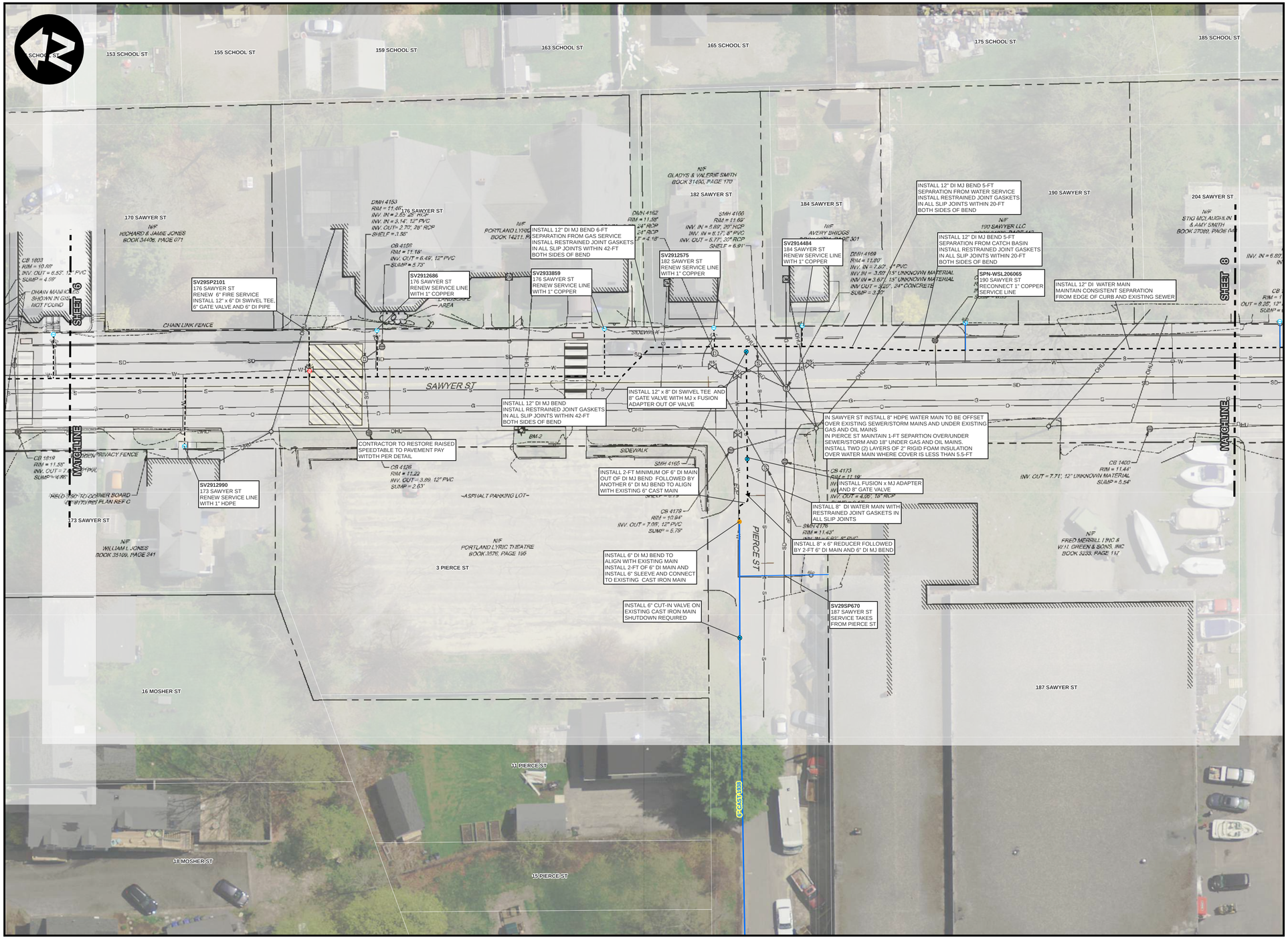
Portland Water District
From Sebago Lake to Casco Bay

SHEET:
W6



PROPOSED MAINS

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PROJECT:
457046

SAWYER STREET
FRONT STREET TO BROADWAY
WATER MAIN REPLACEMENT
SOUTH PORTLAND, MAINE

DATE: 12/21/2023
REV 1 DATE: 1/22/2024
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DRAWN BY: BSJ

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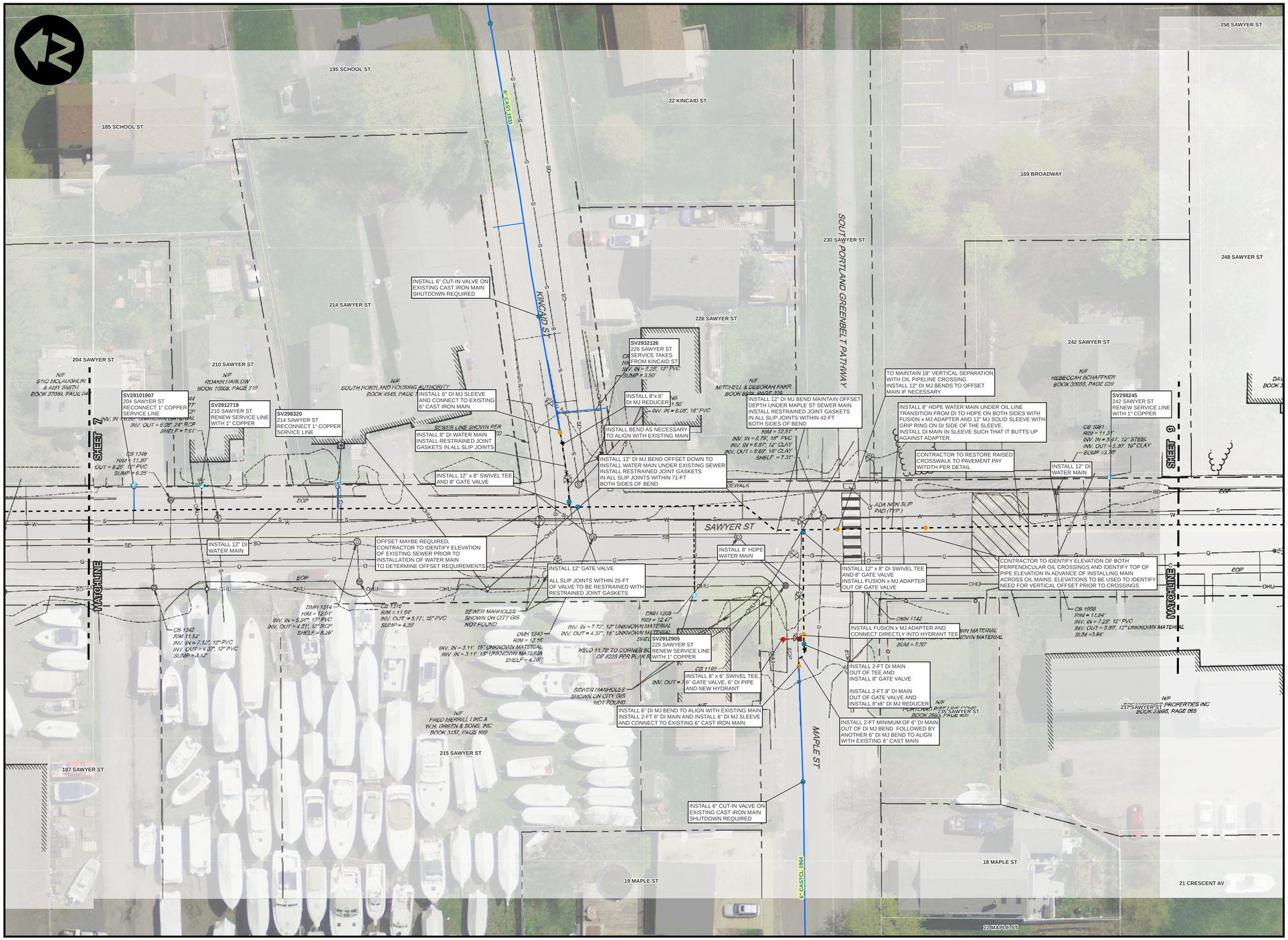
Portland Water District
From Sebago Lake to Casco Bay

SHEET:
W7



PROPOSED MAINS

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PROJECT: 457046

SAWYER STREET
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WATER MAIN REPLACEMENT
SOUTH PORTLAND, MAINE

DATE: 12/21/2023
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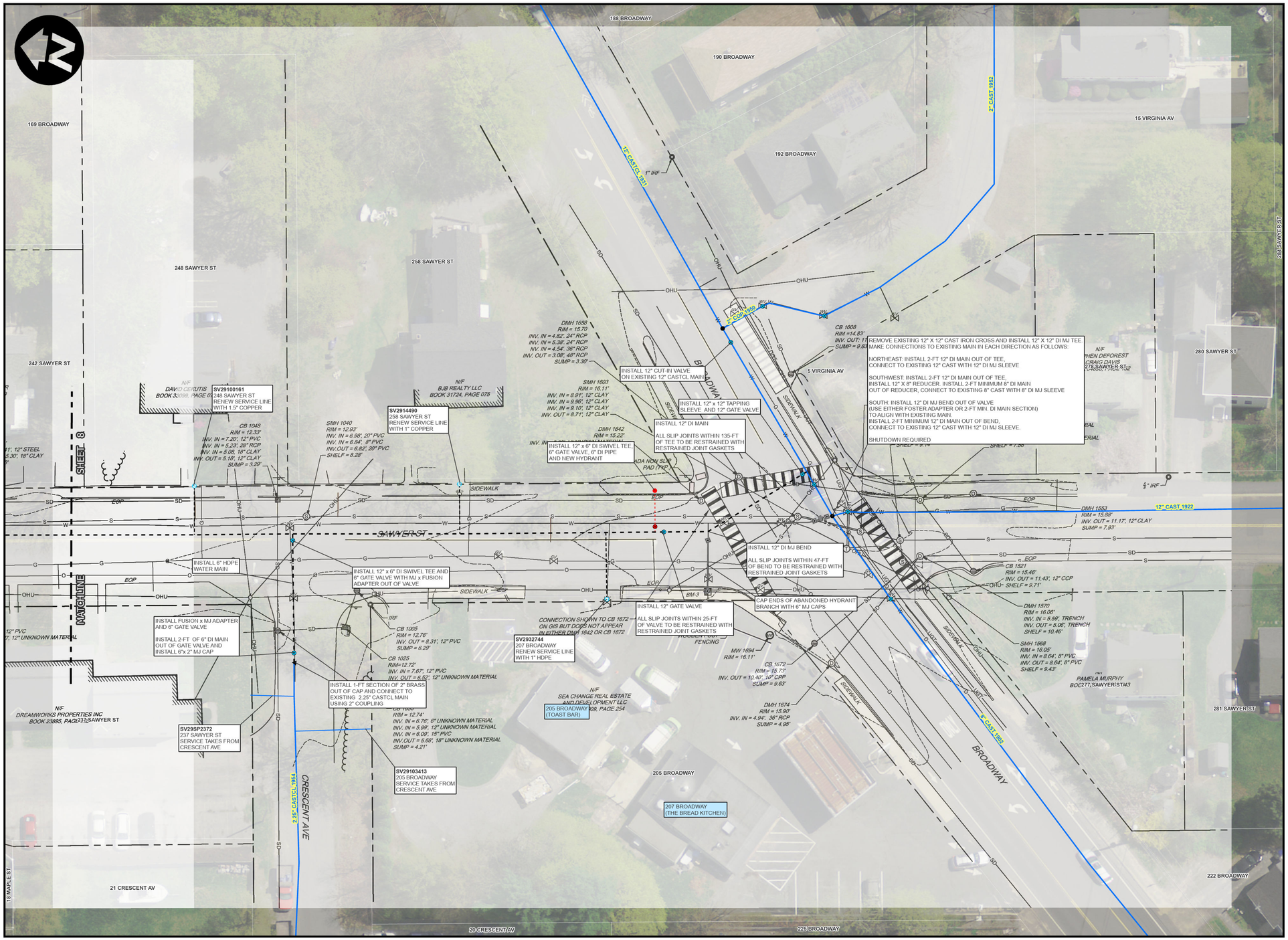
Portland Water District
From Sebago Lake to Casco Bay

SHEET: W8



PROPOSED MAINS

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PROJECT:
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SAWYER STREET
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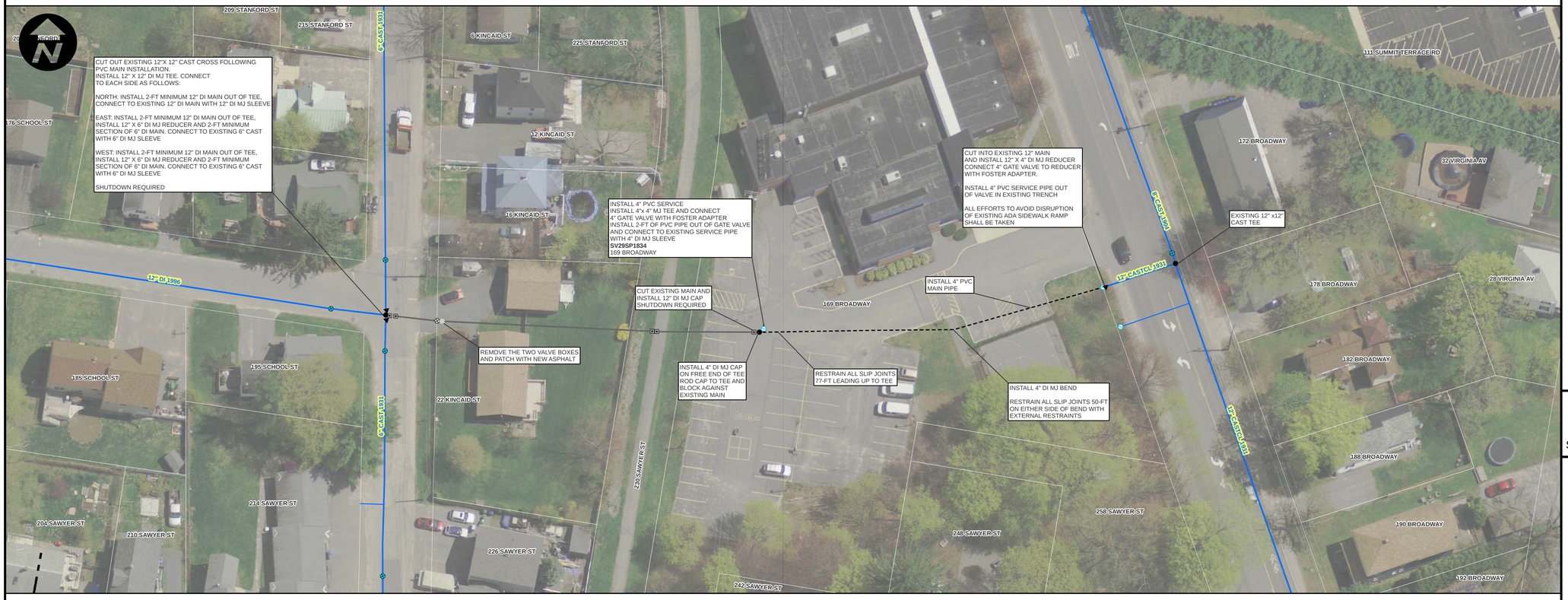
SHEET:
W9

EXISTING CONDITIONS
AND TEMPORARY MAINS



PROPOSED MAINS
AND SERVICES

NOTES

1. CONTRACTOR SHALL DISPOSE OF ALL EXCAVATED PIPING AND APPURTENANCES. SALVAGE ALL REMOVED HYDRANTS AND DELIVER TO PWD YARD AT 225 DOUGLASS ST - PORTLAND.

2. ALL MAINS AND SERVICES SHALL BE INSTALLED WITH 5.5' OF COVER MEASURED FROM PROPOSED ROAD GRADE UNLESS INDICATED OTHERWISE ON THE DRAWINGS OR APPROVED BY A PWD REPRESENTATIVE.

3. THE PORTLAND WATER DISTRICT WILL NOTIFY CUSTOMERS FOR ALL WORK INVOLVING TEMPORARY SHUTDOWN OF SERVICE. CUSTOMERS MUST RECEIVE AT LEAST 48 HOURS NOTIFICATION PRIOR TO ANY SHUTDOWN. THE DISTRICT MUST RECEIVE NOTICE FROM THE CONTRACTOR OF THE SHUTDOWN AT LEAST 4 DAYS PRIOR TO THE PROPOSED SHUTDOWN.

4. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE POLY-WRAPPED PER SPECIFICATIONS.

5. ALL TEMPORARY WATER TO BE BURIED BELOW GRADE AT DRIVEWAYS AND ROAD WAYS.

6. REMOVE ALL OLD PIPING NOT EXPLICITLY CALLED OUT FOR ABANDONMENT.

7. REPLACE ALL SERVICES TO BE RENEWED FROM MAIN TO STREET LINE WITH 1" COPPER PIPING, UNLESS OTHERWISE NOTED.

8. LOCATIONS OF UTILITIES OTHER THAN WATER ARE APPROXIMATE, AND NOT ALL UTILITIES ARE SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, SUPPORTING AND PROTECTING ALL UTILITIES DURING INSTALLATION OF THE WATER MAIN.

9. INSTALL SWIVEL TYPE TEES FOR ALL HYDRANT CONNECTIONS.

10. A SHUTDOWN INCLUDING CUSTOMER NOTIFICATION IS REQUIRED FOR INSTALLATION OF ALL CUT-IN VALVES AND FITTINGS ON EXISTING WATER MAINS.

11. ALL FITTINGS SHALL BE MECHANICAL JOINT (RETAINED).

12. REMOVE THE TOP SECTION OF ALL ABANDONED VALVE BOXES AND FILL WITH SAND.

13. INSTALL A MECHANICAL JOINT CAP ON ENDS OF ALL ABANDONED MAINS.

14. WATER SERVICE PIPING SHOULD RUN OVER OR UNDER THE SEWER WITH A MINIMUM OF 12-INCH VERTICAL SEPARATION UNLESS APPROVAL FOR ALTERNATE INSTALLATION IS PROVIDED BY PWD.

0 15 30 60 90 US Feet

SCALE: 1 IN = 30 FT

LEGEND

- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- TEMPORARY WATER MAIN
- PROPOSED/RENEWED SERVICE
- RECONNECT SERVICE

PROJECT:
457046

SCHOOL STREET ROW
WATER MAIN REPLACEMENT
SOUTH PORTLAND, MAINE

DATE: 12/21/2023
REV 1 DATE: 1/22/2024
REV 2 DATE:

DESIGN BY: AHS
DRAWN BY: BSJ

225 Douglass Street
PO Box 3553
Portland, Maine 04104

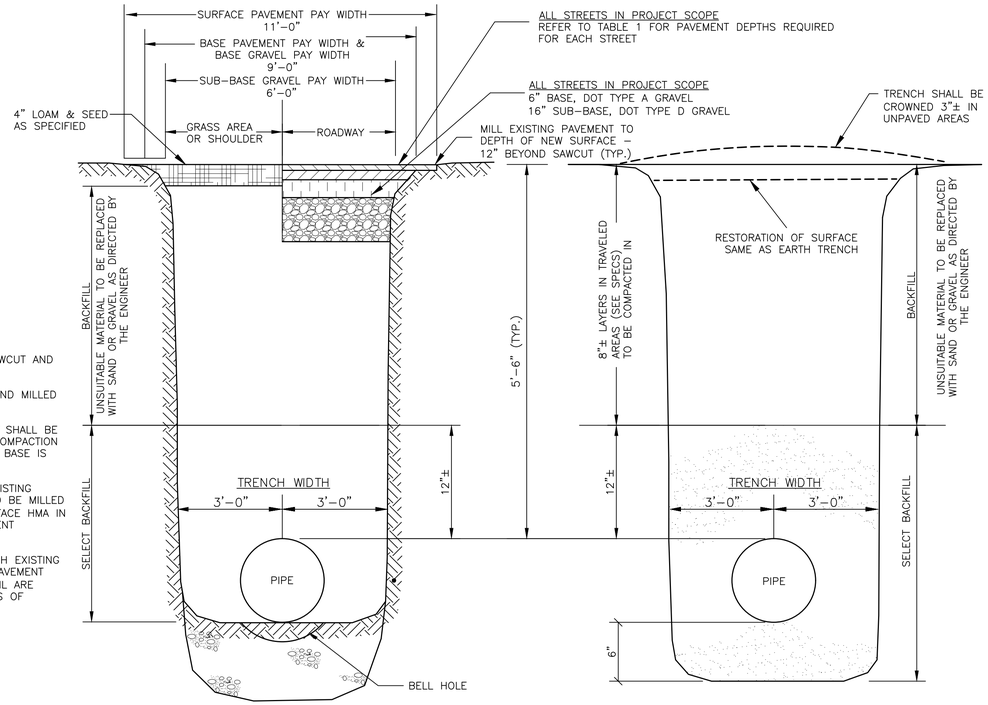
Portland Water District
From Sebago Lake to Casco Bay

SHEET:
W10

TABLE 1		
ROAD	PAVMENT BASE 19MM	PAVMENT SURFACE 9.5MM
BROADWAY	4.5"	1.5"
CRESCENT	4.0"	1.5"
FRONT	4.5"	1.5"
HARTFORD	4.5"	1.5"
HIGH (WEST)	4.0"	1.5"
HIGH (EAST)	3.5"	1.5"
KINCAID	3.5"	1.5"
MAPLE	3.5"	1.5"
MONROE	4.5"	1.5"
PIERCE	3"	1.5"
SAWYER	6"	0"

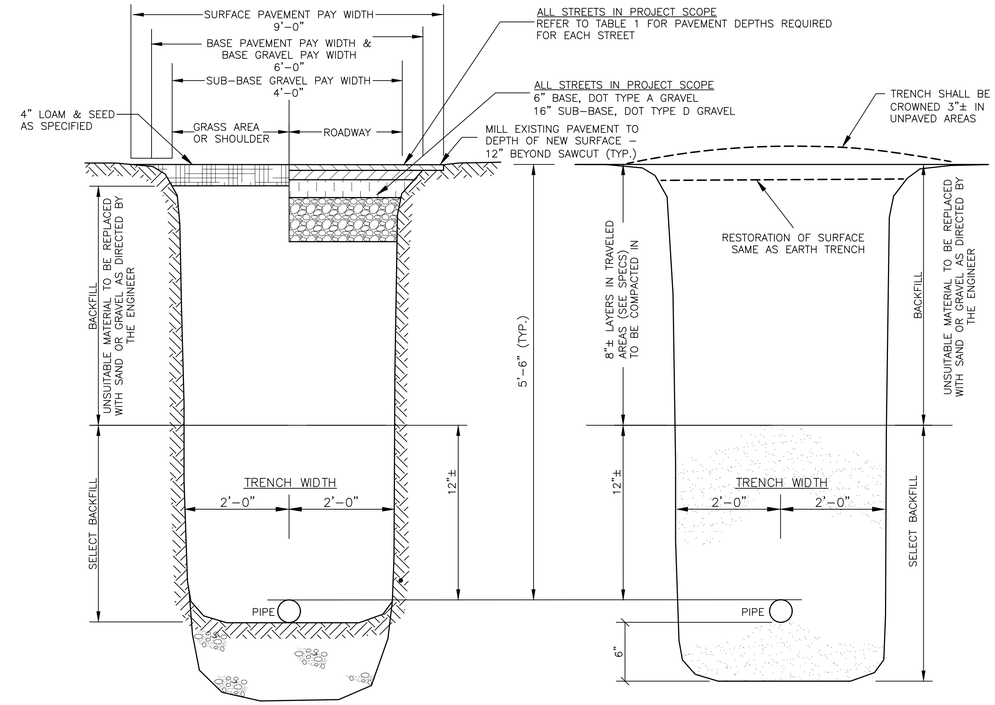
TRENCH SECTION NOTES

1. ALL ROADWAY PAVEMENT SHALL BE SAWCUT AND PLACED WITH A STREET PAVER.
2. TACK COAT APPLIED TO ALL SAWCUT AND MILLED SURFACES.
3. THE FINAL SAW CUTTING OF PAVEMENT SHALL BE PERFORMED AFTER BACKFILLING AND COMPACTION TO THE TOP OF THE EXISTING GRAVEL BASE IS COMPLETE.
4. INSTALL BASE PAVEMENT TO MATCH EXISTING PAVEMENT GRADE IN 2024. TRENCH TO BE MILLED AND PAVED WITH 1.5" OF 9.5MM SURFACE HMA IN SPRING 2025 WHERE SURFACE PAVEMENT REQUIRED.
5. BASE PAVEMENT INSTALLED MUST MATCH EXISTING BASE PAVEMENT DEPTH WITH A MAX PAVEMENT DEPTH OF 6". DEPTHS LISTED IN DETAIL ARE APPROXIMATE BASED ON CITY RECORDS OF PAVEMENT DEPTH.



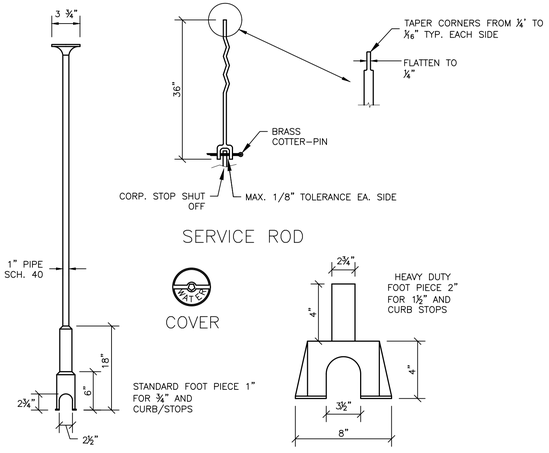
SECTION THRU EARTH TRENCH
WATER MAIN & LARGE SERVICE PIPE (≥4")
NOT TO SCALE

SECTION THRU LEDGE TRENCH
WATER MAIN & LARGE SERVICE PIPE (≥4")
NOT TO SCALE



SECTION THRU EARTH TRENCH
SERVICE PIPE (1"–2")
NOT TO SCALE

SECTION THRU LEDGE TRENCH
SERVICE PIPE (1"–2")
NOT TO SCALE

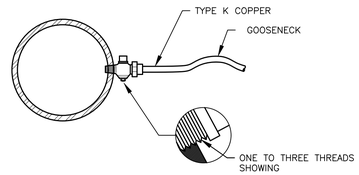


SERVICE ROD

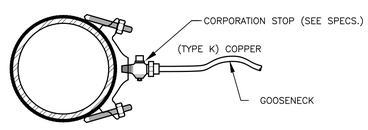
COVER

FOOT PIECE

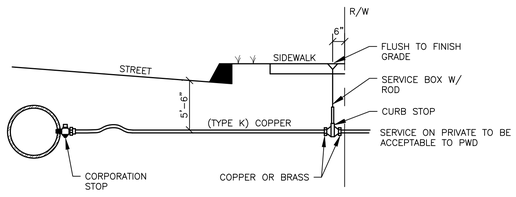
NOTE: ANY EXTENSION OF SERVICE BOX REQUIRES:
1. 1" FEMALE IRON PIPE COUPLING
2. 1" THREADED PIPE (THIS IS TO BE A NON–WELDED, TWO PIECE ARRANGEMENT. SLIP ON ADAPTERS ARE NOT PERMISSIBLE.)



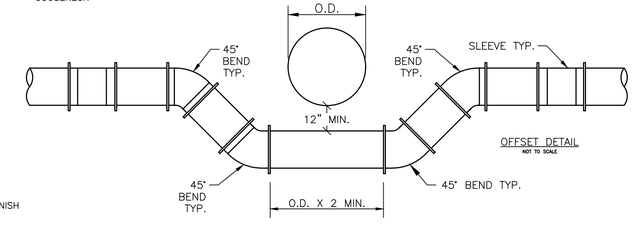
SERVICE TAP
(3/4" AND 1" C.C. THREAD)



SERVICE SADDLE
(1–1/2" AND 2" C.C. THREAD)

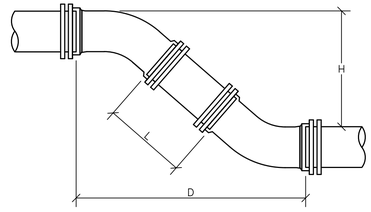


TYPICAL SERVICE CONNECTION



NOTE: DIMENSIONS APPLICABLE FOR SIGMA COMPACT BENDS. FOR TYLER COMPACT BENDS, ADD 1/2" TO "D" DIMENSION AND SUBTRACT 1/2" FROM "L" DIMENSION. FOR OTHER FITTINGS REFER TO MANUFACTURER'S RECOMMENDATIONS.

TYPICAL MAIN OFFSET



	6" PIPE		8" PIPE		12" PIPE	
H	D	L	D	L	D	L
12"	1' 6–1/2"	0' 10–1/2"	1' 7–1/2"	0' 9–1/2"	1' 11–1/2"	0' 5–1/2"
13"	1' 7–1/2"	0' 11–7/8"	1' 8–1/2"	0' 10–7/8"	2' 0–1/2"	0' 6–7/8"
14"	1' 8–1/2"	1' 1–5/16"	1' 9–1/2"	1' 0–5/16"	2' 1–1/2"	0' 8–5/16"
15"	1' 9–1/2"	1' 2–11/16"	1' 10–1/2"	1' 1–11/16"	2' 2–1/2"	0' 9–11/16"
16"	1' 10–1/2"	1' 4–1/8"	1' 11–1/2"	1' 3–1/8"	2' 3–1/2"	0' 11–1/8"
17"	1' 11–1/2"	1' 5–9/16"	2' 0–1/2"	1' 4–9/16"	2' 4–1/2"	1' 0–9/16"
18"	2' 0–1/2"	1' 6–15/16"	2' 1–1/2"	1' 5–15/16"	2' 5–1/2"	1' 1–15/16"
19"	2' 1–1/2"	1' 8–3/8"	2' 2–1/2"	1' 7–3/8"	2' 6–1/2"	1' 3–3/8"
20"	2' 2–1/2"	1' 9–13/16"	2' 3–1/2"	1' 8–13/16"	2' 7–1/2"	1' 4–13/16"
21"	2' 3–1/2"	1' 11–3/16"	2' 4–1/2"	1' 10–3/16"	2' 8–1/2"	1' 6–3/16"
22"	2' 4–1/2"	2' 0–5/8"	2' 5–1/2"	1' 11–5/8"	2' 9–1/2"	1' 7–5/8"
23"	2' 5–1/2"	2' 2"	2' 6–1/2"	2' 1"	2' 10–1/2"	1' 9"
24"	2' 6–1/2"	2' 3–7/16"	2' 7–1/2"	2' 2–7/16"	2' 11–1/2"	1' 10–7/16"
25"	2' 7–1/2"	2' 4–7/8"	2' 8–1/2"	2' 3–7/8"	3' 0–1/2"	1' 11–7/8"
26"	2' 8–1/2"	2' 6–1/4"	2' 9–1/2"	2' 5–1/4"	3' 1–1/2"	2' 1–1/4"
27"	2' 9–1/2"	2' 7–11/16"	2' 10–1/2"	2' 6–11/16"	3' 2–1/2"	2' 2–11/16"
28"	2' 10–1/2"	2' 9–1/8"	2' 11–1/2"	2' 8–1/8"	3' 3–1/2"	2' 4–1/8"
29"	2' 11–1/2"	2' 10–1/2"	3' 0–1/2"	2' 9–1/2"	3' 4–1/2"	2' 5–1/2"
30"	3' 0–1/2"	2' 11–15/16"	3' 1–1/2"	2' 10–15/16"	3' 5–1/2"	2' 6–15/16"
31"	3' 1–1/2"	3' 1–5/16"	3' 2–1/2"	3' 0–5/16"	3' 6–1/2"	2' 8–5/16"
32"	3' 2–1/2"	3' 2–3/4"	3' 3–1/2"	3' 1–3/4"	3' 7–1/2"	2' 9–3/4"
33"	3' 3–1/2"	3' 4–3/16"	3' 4–1/2"	3' 3–3/16"	3' 8–1/2"	2' 11–3/16"
34"	3' 4–1/2"	3' 5–9/16"	3' 5–1/2"	3' 4–9/16"	3' 9–1/2"	3' 0–9/16"
35"	3' 5–1/2"	3' 7"	3' 6–1/2"	3' 6"	3' 10–1/2"	3' 2"
36"	3' 6–1/2"	3' 8–7/16"	3' 7–1/2"	3' 7–7/16"	3' 11–1/2"	3' 3–7/16"
37"	3' 7–1/2"	3' 9–13/16"	3' 8–1/2"	3' 8–13/16"	4' 0–1/2"	3' 4–13/16"
38"	3' 8–1/2"	3' 11–1/4"	3' 9–1/2"	3' 10–1/4"	4' 1–1/2"	3' 6–1/4"
39"	3' 9–1/2"	4' 0–11/16"	3' 10–1/2"	3' 11–11/16"	4' 2–1/2"	3' 7–11/16"
40"	3' 10–1/2"	4' 2–1/16"	3' 11–1/2"	4' 1–1/16"	4' 3–1/2"	3' 9–1/16"
41"	3' 11–1/2"	4' 3–1/2"	4' 0–1/2"	4' 2–1/2"	4' 4–1/2"	3' 10–1/2"
42"	4' 0–1/2"	4' 4–7/8"	4' 1–1/2"	4' 3–7/8"	4' 5–1/2"	3' 11–7/8"
43"	4' 1–1/2"	4' 6–5/16"	4' 2–1/2"	4' 5–5/16"	4' 6–1/2"	4' 1–5/16"
44"	4' 2–1/2"	4' 7–3/4"	4' 3–1/2"	4' 6–3/4"	4' 7–1/2"	4' 2–3/4"
45"	4' 3–1/2"	4' 9–1/8"	4' 4–1/2"	4' 8–1/8"	4' 8–1/2"	4' 4–1/8"
46"	4' 4–1/2"	4' 10–9/16"	4' 5–1/2"	4' 9–9/16"	4' 9–1/2"	4' 5–9/16"
47"	4' 5–1/2"	4' 11–15/16"	4' 6–1/2"	4' 10–15/16"	4' 10–1/2"	4' 6–15/16"
48"	4' 6–1/2"	5' 1–3/8"	4' 7–1/2"	5' 0–3/8"	4' 11–1/2"	4' 8–3/8"
49"	4' 7–1/2"	5' 2–13/16"	4' 8–1/2"	5' 1–13/16"	5' 0–1/2"	4' 9–13/16"
50"	4' 8–1/2"	5' 4–3/16"	4' 9–1/2"	5' 3–3/16"	5' 1–1/2"	4' 11–3/16"
51"	4' 9–1/2"	5' 5–5/8"	4' 10–1/2"	5' 4–5/8"	5' 2–1/2"	5' 0–5/8"
52"	4' 10–1/2"	5' 7–1/16"	4' 11–1/2"	5' 6–1/16"	5' 3–1/2"	5' 2–1/16"
53"	4' 11–1/2"	5' 8–7/16"	5' 0–1/2"	5' 7–7/16"	5' 4–1/2"	5' 3–7/16"
54"	5' 0–1/2"	5' 9–7/8"	5' 1–1/2"	5' 8–7/8"	5' 5–1/2"	5' 4–7/8"
55"	5' 1–1/2"	5' 11–5/16"	5' 2–1/2"	5' 10–5/16"	5' 6–1/2"	5' 6–5/16"

PROJECT:
457046

SAWYER STREET WATER MAIN REPLACEMENT SOUTH PORTLAND, MAINE

STANDARD WATER DETAILS

DATE: 12/21/2023
REV 1 DATE: 1/22/2023
REV 2 DATE:

DESIGN BY: AHS

DRAWN BY: BSJ

225 Douglass Street
PO Box 3553
Portland, Maine 04104

Portland Water District
From Sebago Lake to Casco Bay

SHEET:
D2

MaineDOT Guidelines for the Use of Traffic Calming Devices

Overview

Policy Purpose
The purpose of this policy is to provide guidance to local, regional and State jurisdictions for the application of traffic calming techniques on streets and highway.

Need for Policy
MaineDOT believes that traffic calming, as defined by the Institute of Transportation Engineers, is a valid and useful approach to traffic management.

Since Context Sensitive Solutions and Practical Design are important tools in the designer's toolbox, guidelines are necessary to indicate options available and the limits of acceptance/use of certain traffic calming features on Maine roadways.

Maine's arterial and major collector systems provide a network for the safe and efficient inter-regional movement of people, goods and services between and through major urban centers and municipalities. This sometimes causes conflicts with local needs, such as the compatibility of traffic calming objectives with the prime mobility function of arterial highways. The primary goal of traffic calming is to reduce vehicular speed to a more consistent and acceptable level with secondary gains of reduced crashes and a safer roadway for all users

What is Traffic Calming
For policy purposes, MaineDOT will use the following definition of traffic calming established by the Institute of Transportation Engineers:

"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non motorized street users."

Federal Classifications
This policy is designed to the road system in Maine with Federal functional classifications of principle arterial, minor arterial, major/urban collector, minor collector and local.

Applicability

Prohibition: 40 MPH or Greater
The objectives of certain traffic calming techniques may be incompatible with the mobility function of high speed roadways.

MaineDOT will prohibit certain measures on highways and streets that have Federal functional classifications as minor collectors, major/urban collectors, minor arterials and principal arterials with a posted speed or a design speed limit of 40 miles-per-hour or greater.

These measures include vertical changes involving speed humps, speed bumps, speed tables, or raised intersections, and lateral changes involving chicanes or offset intersections.

Note: This does not preclude the designer from using roadway narrowing using stamped, flush concrete and raised islands are all still allowed on these types of roadway.

Local streets, Minor Collectors, Urban Roadways classified as local streets and collectors with a posted speed of 35 mph and below.

The full range of traffic calming techniques may be considered appropriate for implementation on highways bearing these Federal functional classifications.

Arterial Highways and Streets posted 35 mph and below

Arterial Highways and Streets

The prime function of the higher classifications roadways such as arterial highways and streets is to provide mobility for transportation system users.

Traffic calming on minor arterials and principle arterials with posted speeds or designed to be posted with a speed limit of 35 miles-per-hour and below shall not be considered unless:

- It can be shown that the 85th percentile speed is greater than 10 miles per hour over the posted speed; or
- there are high crash locations on the route that can be mitigated with speed reduction; or
- there are documented issues regarding the safety of pedestrians along the roadway.

Traffic calming should not be the first step undertaken for remediation of the above issues. Standard enforcement should be undertaken first. Next, additional regulatory, warning and or guide signs may be installed to try to obtain compliance. If the municipality can document that one of the above criteria is met, and the municipality has also shown that increased enforcement and signage have not produced satisfactory results, then the matter shall be brought before the engineering council on a case by case basis.

Note: This does not preclude the designer from using roadway narrowing using stamped, flush concrete and raised islands are all still allowed on these types of roadway.

Minor Collectors and Major/Urban Collectors 35 MPH and Below

Vertical changes involving speed tables, raised intersections, and lateral changes involving chicanes, offset intersections, or lateral shifts in the geometric alignment shall be allowed on highways and streets that have Federal functional classifications as Minor Collectors and major/urban collectors with posted speeds or designed to be posted with a speed limit of 35 miles-per-hour and below.

Local Government Official Approval

The Department shall further require that any local or regional jurisdiction that is considering traffic calming within their community must officially approve the change at the local government level before MaineDOT will consider official approval.

Community Traffic Calming Plan

It is also recommended that a community considering traffic calming measures develop a municipality-wide or regionally- based traffic calming plan that documents the needs and specifies the areas where traffic calming may be appropriate to address the needs of the community.

This municipal/regional plan should be reviewed and approved by the responsible municipal/regional authority (council/select board) and MaineDOT (this only applies for municipalities with plans to use traffic calming on a state or state-aid roadway). Possible exceptions to the policy on arterial traffic calming should be identified in these plans and reviewed on a case-by-case basis for the purposes of identifying the most appropriate treatment to solve the problem. Any proposed treatments must minimize potential conflicts between the objectives of traffic calming and the overall mobility function of roadways.

Please note that traffic calming may cause diversion of traffic into unwanted/unintended areas. These ramifications should be identified and weighed before indiscriminately using a traffic calming technique.

Table: Federal Functional Class and Speed Limits

ALLOWABLE VERTICAL & LATERAL CHANGES

Federal Functional Class

Principal Arterial		Minor Arterial		Major Collector		Minor Collector	
≤ 35 mph	40+	≤ 35 mph	40+	≤ 35 mph	40+	≤ 35 mph	40+
N*	N	N*	N	Y	N	Y	N

*** Narrowly defined exceptions listed in policy**

RESOURCES:

Some good references for traffic calming can be located at the following sites:
http://www.ite.org/traffic/index.asp.
This website includes "Traffic Calming: State of the Practice, ITE/FHWA, August 1999".

http://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Also, see MUTCD Sections 2C.29 Speed Hump Sign (W17-1) and Sections 3B.22 thru 26 and Figures 3B.28 thru 31 for additional guidance on signing and striping.

Traffic Calming Measures

Traffic calming measures often have trade-offs to get the desired result. Below is a list of measures with items to be taken under consideration, other measures will be considered on a case by case basis.

Pictures of the different measures can be found on the P Drive under **P:\traffic engineering\traffic calming measures.**

Driver feedback signs – These types of dynamic signs can be used on the roadway to provide information to the driver that may or may not be readily apparent, such as: dynamic speed display, pedestrian activated rectangular rapid flashing beacons, blank out signs that convey messages that are only in effect at certain times such as "No Turn On Red", "Yield to Pedestrians". These types of devices sometimes have little effect in and of themselves, but may be combined with features shown below to provide a more complete solution. *Items to consider: these devices often have power and future maintenance costs associated with them, municipalities that are asking for traffic calming are be required to pay electrical and on-going maintenance costs for these devices.*

Vertical changes in the street – Speed tables and raised intersections/crosswalks can be effective tools in slowing traffic along a route. A speed study should be performed prior to considering the use of these devices to determine if there is truly an issue to resolve. Speed Table tops are normally four inches high with a minimum table top of ten feet with six foot ramps (both measured longitudinally to the roadway). See Tables 1, 2 and 3. *Items to consider: drainage issues, volumes of trucks in relation to noise made by shifting loads, fire and safety response times, who has winter maintenance responsibilities and ability to plow, location of trucking firms (ie. Heavy- haul route, bike routes may require a larger gutter so as not to impede bike traffic, need to have proper lighting/delineation/signage.*

Lateral changes in the street – Chicanes are used to slow traffic down in mid-block areas or in advance of an intersection. They are usually constructed using raised island to force traffic to perform an S shape maneuver. The deflections should be at least 45 degrees and provide a path large enough for the largest design vehicle to pass. *Items to consider: Is there ample ROW, would the chicanes remove parking in an area, drainage issues, impacts on access and turning vehicles, width for plowing, needs to have the proper lighting/delineation/signage.*

Roadway narrowing – Spot narrowing of the roadway can help in reducing speeds along certain stretches of roadway. The narrowing can occur using a center island/median or the use of edge islands in the form of a bump out. The islands can be either raised, flushed concrete, stamped pavement or a combination. Raised island are the most effective as shy distance enters the equation. Flushed islands may allow more flexibility as the roadway can be narrowed more than with raised islands and still allow needed traffic movements. Curb bump-outs and center medians can also provide safe havens for pedestrians. Road narrowing can also be used at intersections using a passenger car template as the basic design and using a raised apron to accommodate the largest design vehicle. While less likely to decrease speed in and of themselves, optical speed bars have been shown to help in combination with other treatments. On some roadways, the addition of striping or wider striping may also lead to a calming effect over what was originally present. *Items to consider: width for plowing, check with entity that provides winter maintenance, loss of parking, drainage issues, bike routes, need for proper lighting/delineation/signage.* **Note, while on-street-parking may act as a traffic calming**

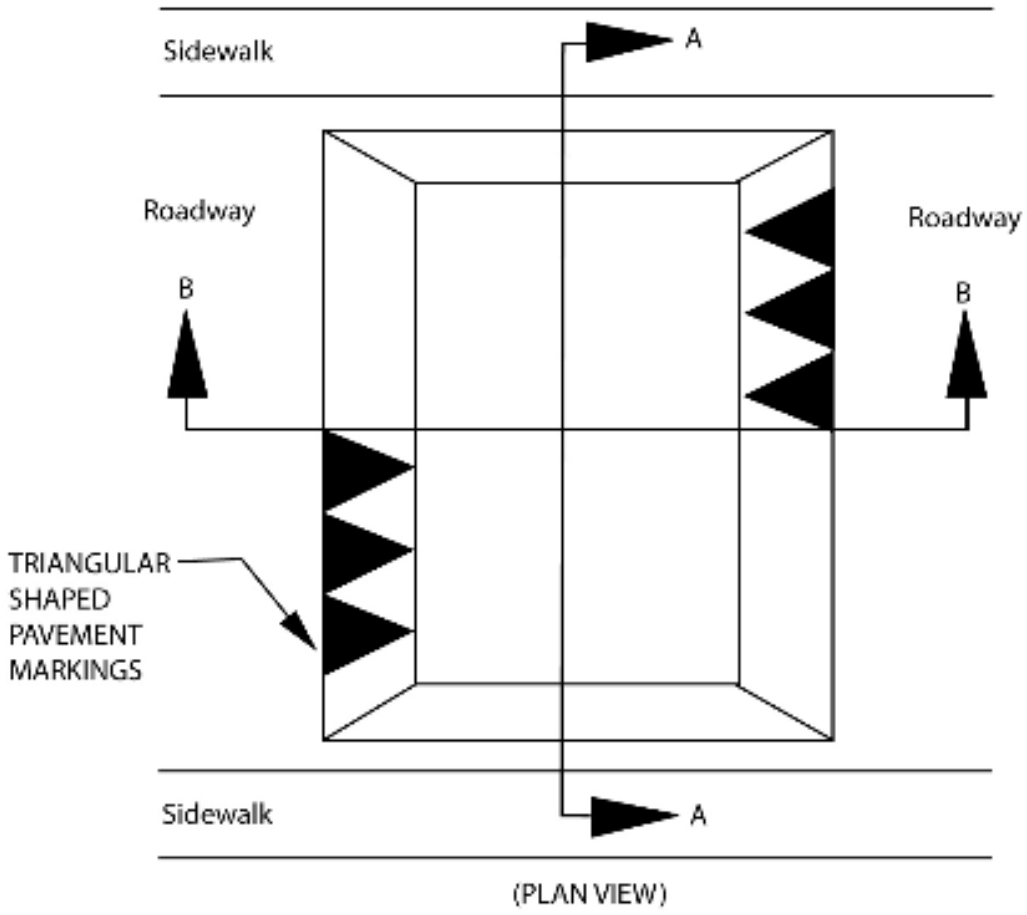
feature, it is not a technique that should be artificially introduced to a roadway as traffic calming. On-street parking should only be installed where there is a documented need.

Roundabouts/mini-roundabouts – Roundabouts have been shown to handle substantial traffic, reduce crash rates over a standard four-way signalized and un-signalized intersection and should be looked at as an alternative during enhanced project scoping. Roundabouts lessen the number of potential vehicle-to-vehicle conflict points, lessening the chances for crashes. Roundabouts have been shown to reduce overall speed and cause only a minimum diversion in traffic. Mini-roundabouts are used at smaller type intersections usually on local roads. Mini-roundabouts have a totally mountable inner circle. They provide the same benefits as a roundabout. One major difference is that left turning traffic, for the most part, travels over the inner circle. From a cost/benefit standpoint, a roundabout may not be a practical solution solely to reduce speed if there are no other safety issues present. *Items to consider: ROW, overall costs, drainage issues, roadway entrance grades, separator islands, design speed, education, two lane roundabouts are difficult to navigate for bicyclists and pedestrians,*

Table 1 Speed Table Plan View

MaineDOT

Speed Table Details



(PLAN VIEW)

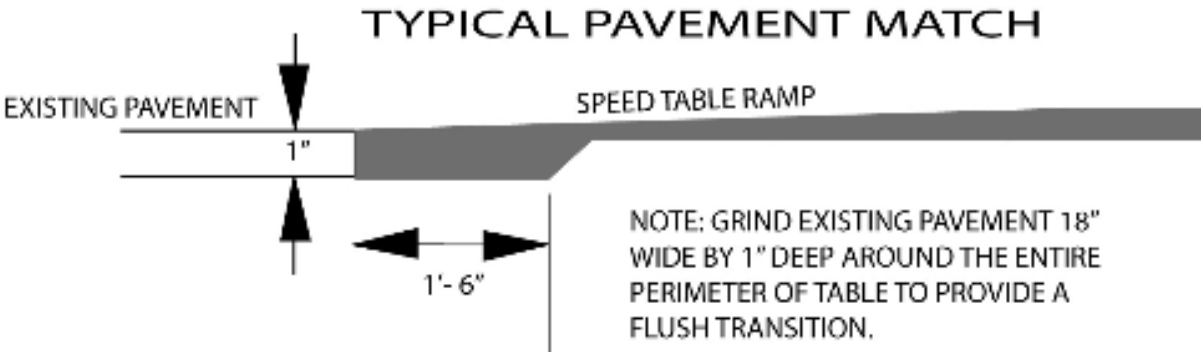


Table 2 – Speed Table Cross-Sections

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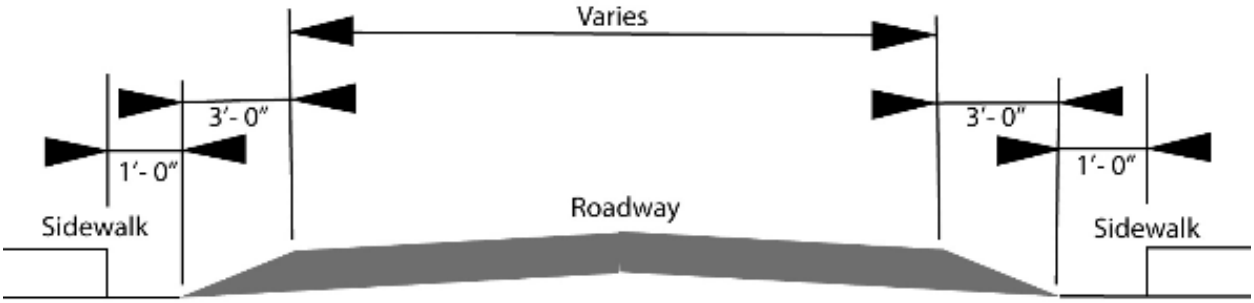
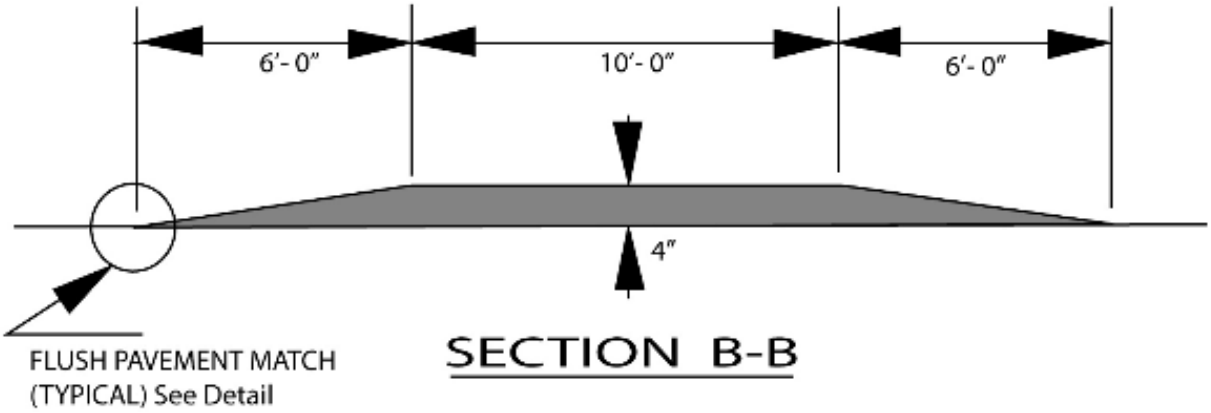
Speed Table Details Continued

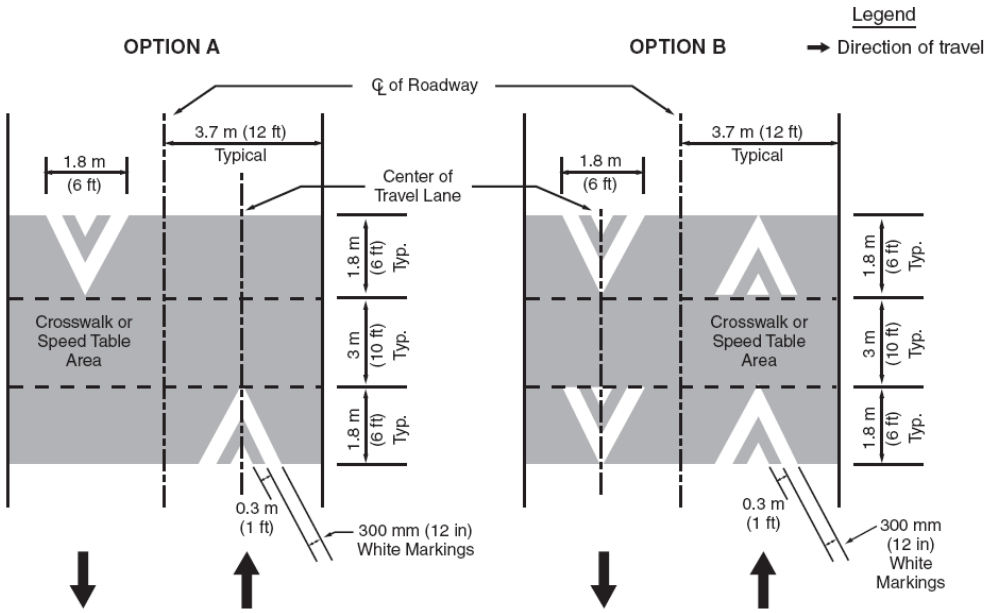


SECTION A-A



SECTION B-B

Table 3 – Speed Table Markings



Option:

Advance speed hump markings may be used in advance of an engineered vertical roadway deflection where added visibility is desired or where such deflection is not expected (see Figure 3B-31).

Advance pavement wording such as BUMP or HUMP (see Section 3B.19) may be used on the approach to a speed hump either alone or in conjunction with advance speed hump markings. Appropriate advance warning signs may be used in conformance with Section 2C.24.

Guidance:

If used, advance speed hump markings should be installed in each approach lane.