



Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

PORTLAND WATER DISTRICT

225 Douglass Street
Portland, Maine 04102

ADDENDUM NO. 1
TO
CONTRACT DOCUMENTS
FOR

Mt Vernon Street - Water Main Replacement

South Portland, Maine
February 16, 2023



QUESTIONS & RESPONSES

1. What is the street opening permit fee for the project?
 - a. Per the City of South Portland's Code Enforcement Department, the Contractor will be responsible for taking out a Street Opening Permit that carries a standard flat rate fee of \$486.00.

SPECIFICATION UPDATES

1. **Section 00410 – Bid Form.** Updated to reflect changes in quantities due to added bid items (blowoff & tapping sleeve) and updated gravel and HMA quantities based on revised trench restoration detail.
2. **Section 01010 – Summary of Work.** Updated to reflect the Summary and Duties of the Contractor relative to materials provided and licence requirements through the City of South Portland.
3. **Section 01250 – Measurement & Payment.** Updated to reflect addition of Blowoff bid and Tapping Sleeve items and changes to HMA bid items (acknowledge milling and change surface material type).
4. **Section 02595 – Disinfection.** Updated flushing process description.

DRAWINGS

1. **Sheet D2.** Standard Detail Sheet updated to reflect changes to trench restoration details

ATTACHMENTS

1. Section 00410 - Bid Form - Revised
2. Section 01010 - Summary of Work - Revised
3. Section 01250 - Measurement and Payment - Revised
4. Section 02595 - Disinfection - Revised
5. Sheet D2 - Revised

Section 00410

Bid Form

Portland Water District
Mt Vernon Street Water Main Renewal
South Portland, Maine
2023 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:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

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 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):

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Bid Unit Price</u>	<u>Bid Price</u>
W1	4-inch Ductile Iron Water Main (DI Main provided by Owner)	LF	292	\$	\$
W2	4-inch Gate Valve	EA	2	\$	\$
W3	2-inch Blowoff	EA	1	\$	\$
W4	6-inch X 4-inch Tapping Sleeve	EA	1	\$	\$
W5	1-inch Copper Service - Short side	EA	4	\$	\$
W6	1-inch Copper Service - Long side	EA	3	\$	\$
W7	1-inch Copper Service - Reconnect	EA	1	\$	\$
W8	Gravel Borrow	CY	40	\$	\$
W9	Unsuitable Material Excavated Below Grade	CY	20	\$	\$
W10	Rock Excavation	CY	20	\$	\$
W11	Aggregate Subbase Course Type D	CY	105	\$	\$
W12	Aggregate Base Course Type A	CY	60	\$	\$
W13	HMA Binder Course – 19MM	T	85	\$	\$
W14	HMA Surface Course – 9.5MM	T	40	\$	\$
W15	Work Zone Traffic Control	LS	1	\$	\$
W16	Flagging	LS	1	\$	\$
W17	Foreman	HR	5	\$	\$
W18	Laborer	HR	5	\$	\$
W19	Excavator w/ Operator	HR	5	\$	\$
W20	Loader w/ Operator	HR	5	\$	\$

W21	Dump Truck w/ 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 01010

Summary of Work

PART 1 - GENERAL

1.01 SUMMARY

- A. The Contractor shall furnish and install water main and appurtenances in Mt Vernon Street. South Portland, Maine as shown on the Drawings and specified herein.
 - 1. The Owner shall provide water main and standard gaskets to the Contractor. The Contractor shall be responsible for furnishing all other appurtenances for the project.
- B. The Contractor shall perform leakage and pressure tests and disinfect the installed water main as specified herein.

1.02 DUTIES OF THE OWNER

- A. The Owner will notify the Contractor when the ductile iron pipe and gaskets have arrived and are available for pickup by the Contractor. The estimated delivery date of the ductile iron pipe is February 15, 2023.
 - 1. If the ductile iron pipe has not arrived prior to May 1, 2023, the Owner shall adjust the Contract Times with the Contractor via a change order.
- B. The Owner will locate the terminal points of the work and will also locate any of its facilities lying in close proximity which would in any way be a hazard to the Contractor's operations.
- C. The Owner will operate any valves or hydrants which may be found desirable or necessary to be used for any purpose.
- D. The Owner will notify customers of all work involving temporary shutdown of service.

1.03 DUTIES OF THE CONTRACTOR

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto.
- B. Provide water mains to supply the Owner with a satisfactory, watertight pipeline, laid to proper line and grade in accordance with these contract documents, to the satisfaction of the Owner. The Contractor shall leave the site in a condition, which is suitable to the Owner, abutting landowners and any municipal or state authorities having jurisdiction over the areas involved.
- C. The Contractor shall furnish plant and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the time stipulated in the Contract.
- D. The Contractor is required to have a valid excavator's license in the City of South Portland and shall obtain all necessary street opening permits and comply with all rules and regulations associated with those permits. Any fees associated to obtaining these permits shall be the responsibility of the Contractor.

- E. The Contractor must give the Owner adequate notice of all planned activities such as shutdowns to allow time for customer notification.
- F. The Contractor shall schedule a Pre-Construction Meeting with the District's Construction Scheduler three to four weeks ahead of planned start of construction.
- G. The Contractor shall schedule construction inspection services with the District's Construction Scheduler two weeks ahead of planned start of construction.
- H. The Contractor will furnish all fuel, gasoline, oil, etc. for the operation of his equipment, all tools and equipment, and all labor and supervision necessary for the handling of material, for excavation, installation, backfilling and cleaning the site as required. He will dispose of excess spoil and restore the land surface to the original contour over the entire length of the project. Restoration shall be made to the satisfaction of the Engineer.
- I. The Contractor will perform the pressure and leakage test and disinfection of the main as described herein in the presence of the Engineer or Owner.
- J. The Contractor shall install and maintain a temporary water system sufficient to maintain service to all customers during the water main replacement.
- K. The Contractor shall coordinate with the Owner and the Distributor of the Ductile Iron Pipe to be installed to transport the pipe to the job site from either the Owner's stockyard or the Distributor's stockyard.

PART 2 – PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

-- END OF SECTION --

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. Crossing other utilities
 - 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 (e.g., repair of sidewalks, trenches across roadways and driveways), construction sequencing or maintenance of operations 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).

1.03 PAYMENT ITEMS

A. Item W1 - 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 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. Ductile iron water main and standard gaskets shall be provided by the Owner.
3. Schedule of Payment: Installation - 80%, Testing - 20%

B. Item W2 - Gate 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, sleeves (where required) valve box, 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%

C. Item W3 – Blowoff

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, piping, valve, fittings, valve boxes, select backfill, backfilling, testing, cleanup, and associated work as specified and shown on Drawings.
3. Schedule of Payment: Installation - 100%

D. Item W4 – Tapping Sleeve

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, tapping sleeve, backfill, testing, and associated work as specified and shown on Drawings.
3. Schedule of Payment: Installation - 100%

E. Items W5 to W7 - 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, backfilling, 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. Item W8 - 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%

G. Item W9 - Unsuitable Material Excavated Below 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%

H. Item W10 - 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%

I. Item W11 - 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%

J. Item W12 - 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%

K. Items W13 & W14 - 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:

$$\begin{array}{ccccccc}
 \text{Paving Area} & \times & \text{Paving Thickness} & \times & 0.06 & = & \text{Paving Weight} \\
 \text{(square yards)} & & \text{(inches)} & & & & \text{(tons)}
 \end{array}$$

2. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for placing hot bituminous pavement, milling, 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%

L. Items W15 & W16 - 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, construction signage, flaggers, and associated work as specified.
3. Schedule of Payment: Final Completion - 100%

M. Items W17 & W18 - 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%

N. Items W19 to W21 - 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 02595

Disinfection of Water Mains

PART 1 - GENERAL

1.01 SCOPE

- A. Furnish all labor, materials, equipment, and incidentals necessary to disinfect the distribution system.
- B. Do not disinfect water mains until pressure and leakage testing is completed, see Section 02594.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The Contractor shall chlorinate the new main in accordance with the continuous feed method specified in Section 5.2 of AWWA Standard C651-latest revision, using 5% to 15% sodium hypochlorite solution.
- B. The Contractor may use calcium hypochlorite granules or tablets placed in the new mains during installation in accordance with Section 5.1 of AWWA Standard C651-latest revision, as a supplement to the continuous feed method.

PART 3 - EXECUTION

3.01 DISINFECTION

- A. Upon satisfactory completion of the pressure and leak test, all new water mains shall be disinfected before they are placed into service in accordance with Section 5.2 of AWWA Standard C651-latest revision and the procedures specified herein.

3.02 FLUSHING

- A. Section of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a suitably sized tap should be provided.
- B. All taps required by the Contractor for chlorination or flushing purposes, or for temporary release of air, shall be provided by him as part of the construction of the water main.
- C. Flushing shall be performed at a flow rate and velocity calculated by the Owner in accordance with AWWA Standard C651.

3.03 REQUIREMENTS OF CHLORINE

- A. Before being placed into service, the main shall be chlorinated so that a chlorine residual of not less than 10 parts per million remains in the water after standing 24 hours in the pipe. Chlorine residual at start of test shall be at least 25 parts per million.

3.04 POINT OF APPLICATION

- A. The preferred point of application of the chlorinating agent is at the beginning of the pipeline or any valved section of it and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine solution water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipeline extension. Alternate points of application may be used when accepted or directed by the Engineer.

3.05 RATE OF APPLICATION

- A. Water from the distribution system, or other source of supply as accepted by the Engineer, shall be controlled to flow very slowly into the newly laid pipeline during application of the chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the newly laid pipe that the dosage applied to the water will be sufficient to achieve at least 25 parts per million unless otherwise directed by the Engineer.

3.06 PREVENTING REVERSE FLOW

- A. Valves shall be operated by the Owner so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Check valves may be used, if desired.

3.07 RETENTION PERIOD

- A. Treated water shall be retained in the pipe at least 24 hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least 10 parts per million.

3.08 CHLORINATING VALVES AND HYDRANTS

- A. In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.

3.09 FINAL FLUSHING AND TESTING

- A. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows, upon tests, that the residual chlorine is not in excess of that to be carried in the system.
- B. After flushing, water samples collected from the treated piping system as directed by the Engineer, shall show satisfactory bacteriological results. Bacteriological analyses shall be performed by the Owner.
- C. Chlorine residual of water being flushed from the newly laid pipe following chlorination must be neutralized by treating with one of the chemicals listed in the table below.
- D. Amounts of chemicals required to neutralize various residual chlorine concentrations in 100,000 gallons of water*

Residual Chlorine Concentration (mg/L)	Sulphur Dioxide	Sodium Bisulfate	Sodium Sulfite	Sodium Thiosulfate
1	0.8	1.2	1.4	1.2
2	1.7	2.5	2.9	2.4
10	8.3	12.5	14.6	12.0
25	20.9	31.3	36.5	30.3

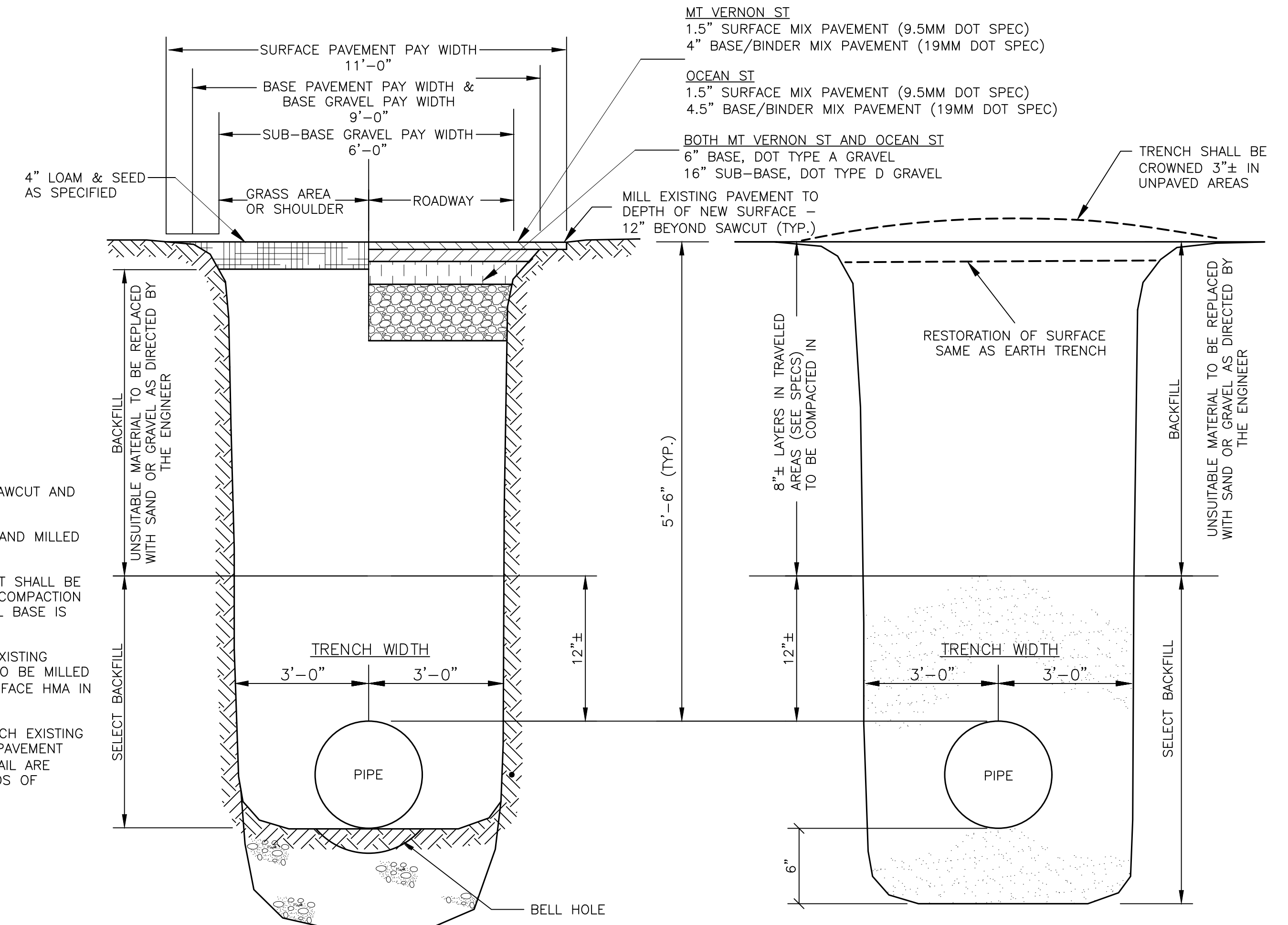
*Except for residual chlorine concentration, all amounts are in pounds.

3.10 REPETITION OF FLUSHING AND RESULTS

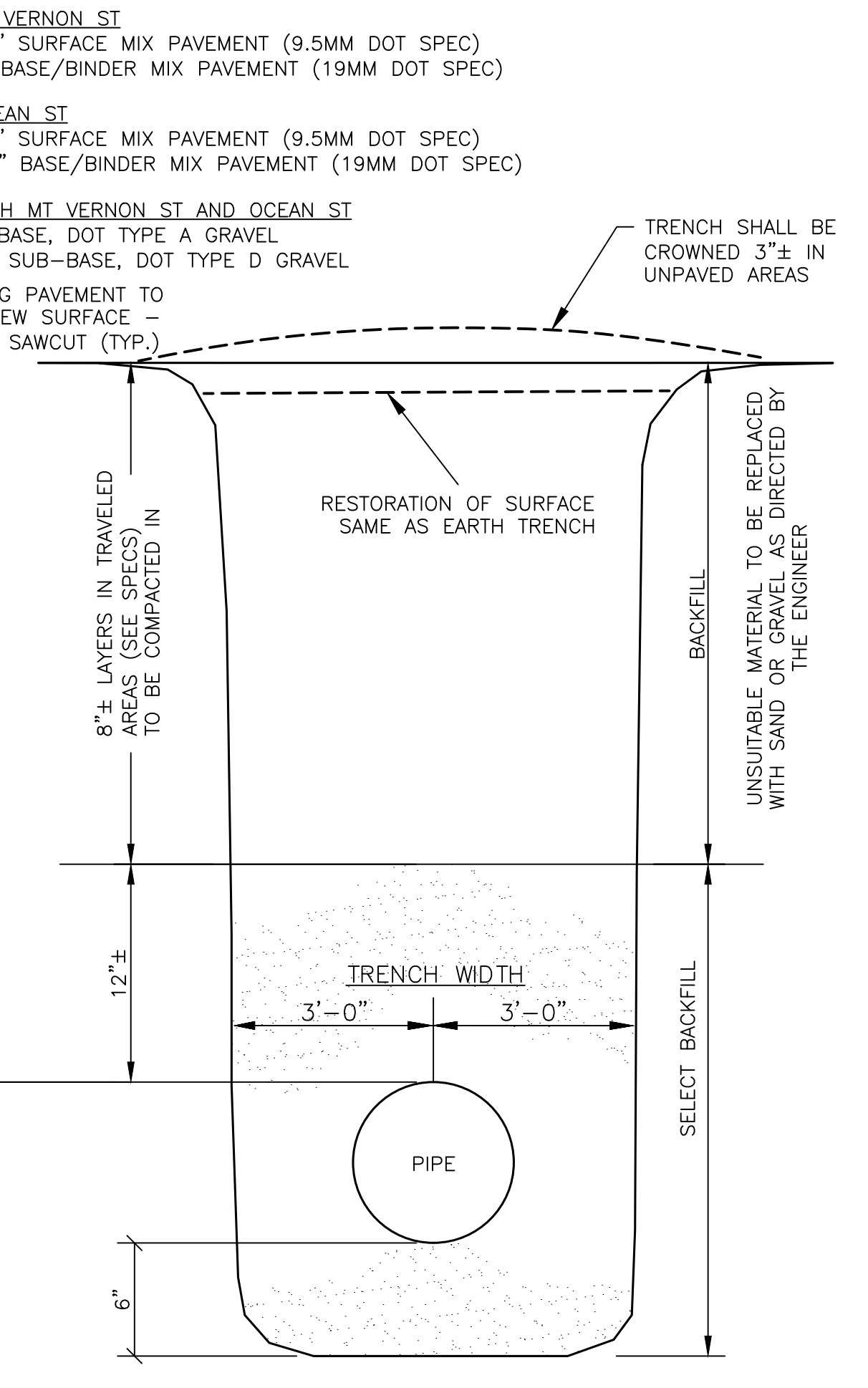
- A. If the initial disinfection and flushing fail to produce satisfactory analytical results, the main shall be reflashed and resampled. If check samples show the presence of coliform organisms, then the main shall be rechlorinated by the Contractor using the continuous feed method of chlorination. If the second rechlorination attempt fails to produce satisfactory analytical results, the Contractor shall submit a plan to achieve passing results for PWD review and approval; remedies shall include but are not limited to pigging or replacement of pipe.

-- END OF SECTION --

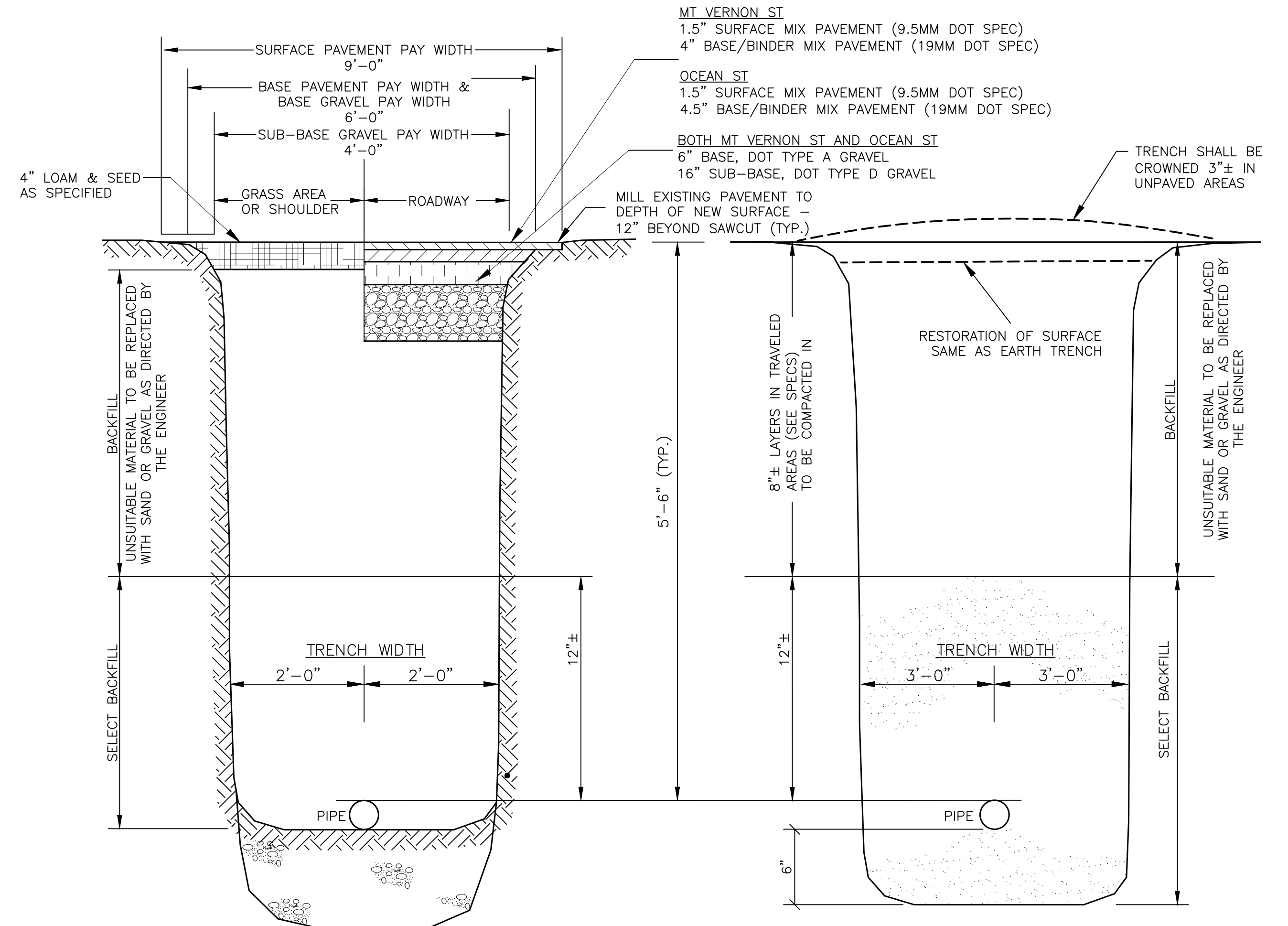
**MOUNT VERNON STREET
WATER MAIN REPLACEMENT
SOUTH PORTLAND, MAINE**



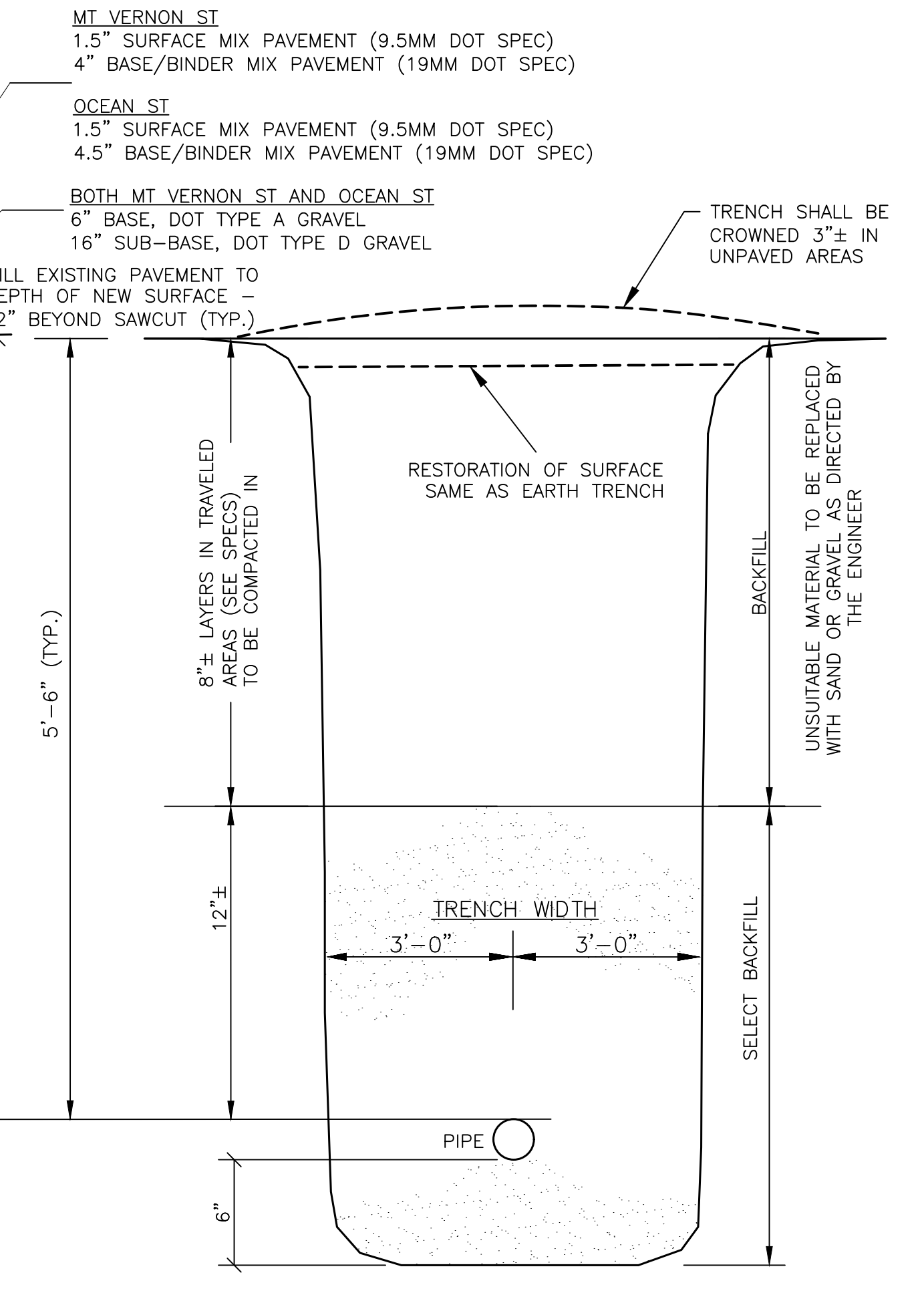
SECTION THRU EARTH TRENCH
WATER MAIN & LARGE SERVICE PIPE (≥4")
NOT TO SCALE



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

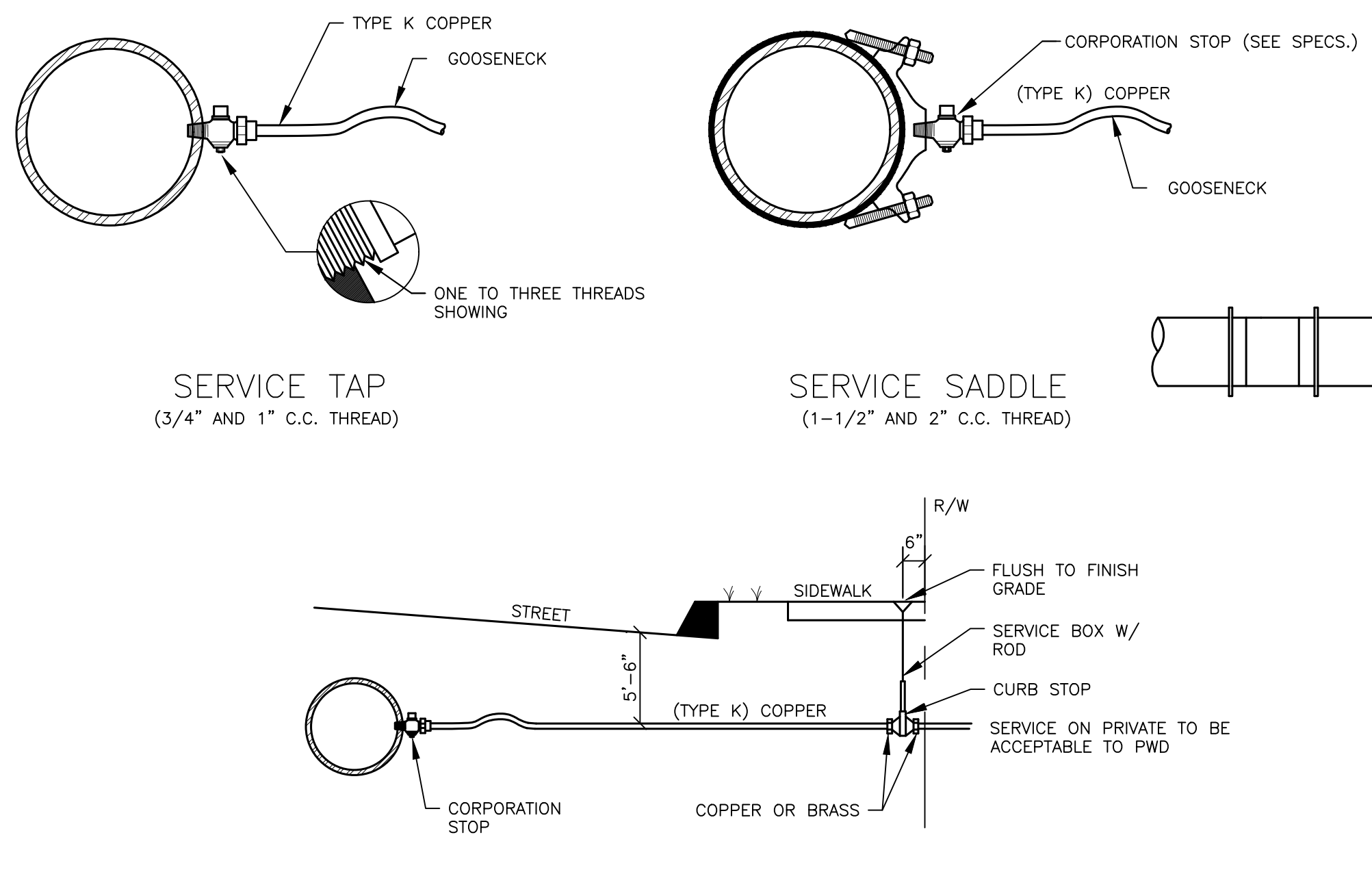
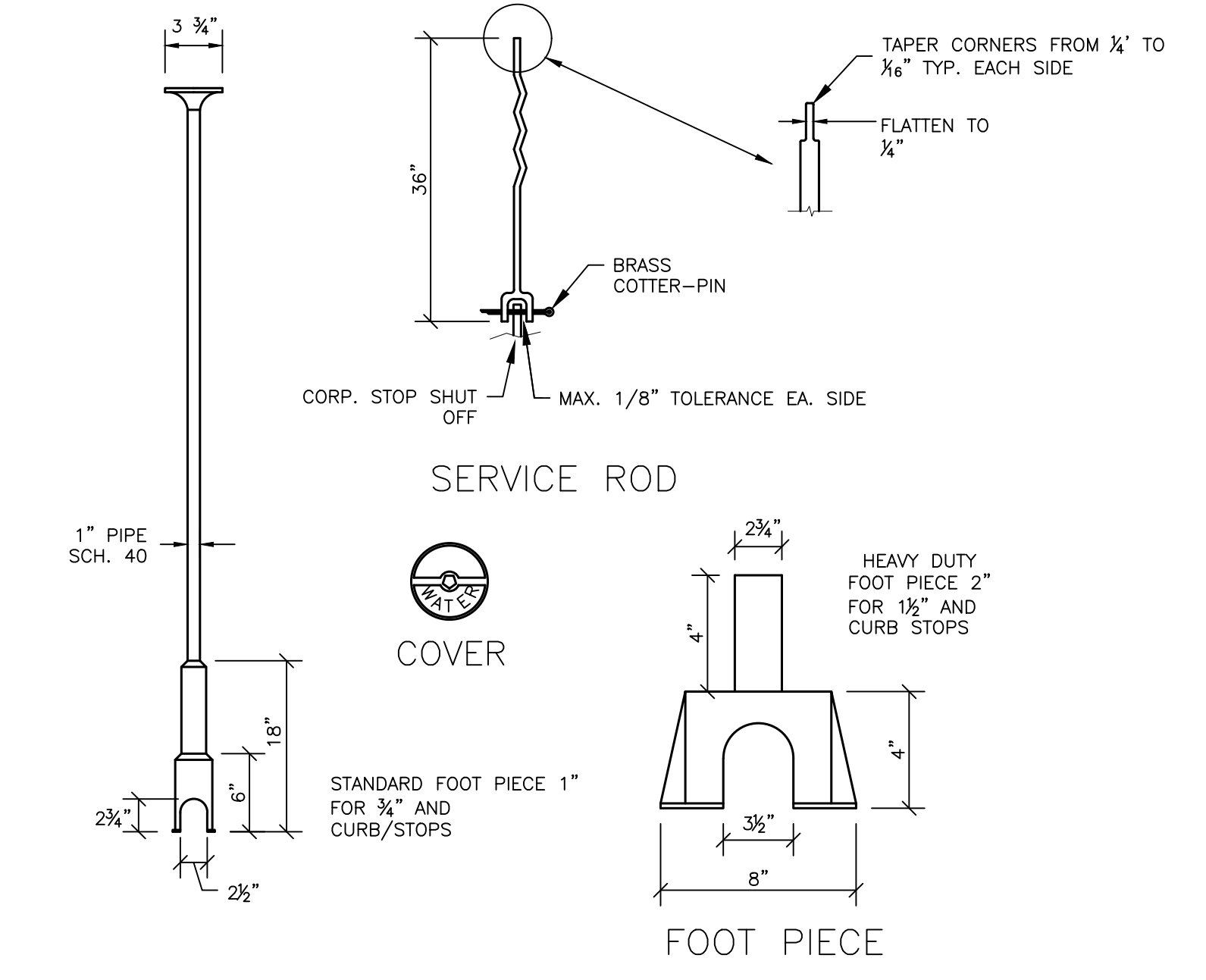


SECTION THRU EARTH TRENCH
SERVICE PIPE (1"-2")
NOT TO SCALE

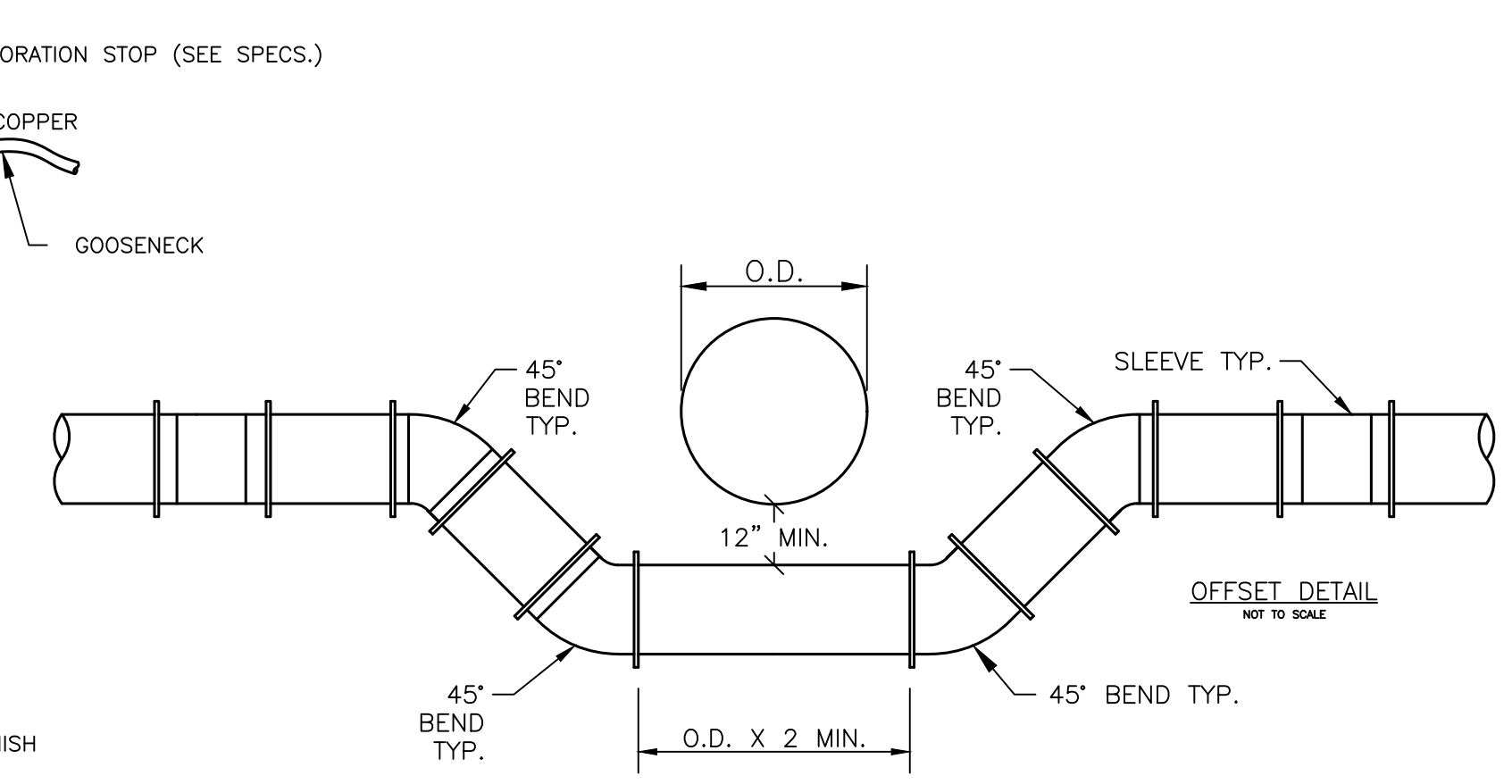


SECTION THRU LEDGE TRENCH
SERVICE PIPE (1"-2")
NOT TO SCALE

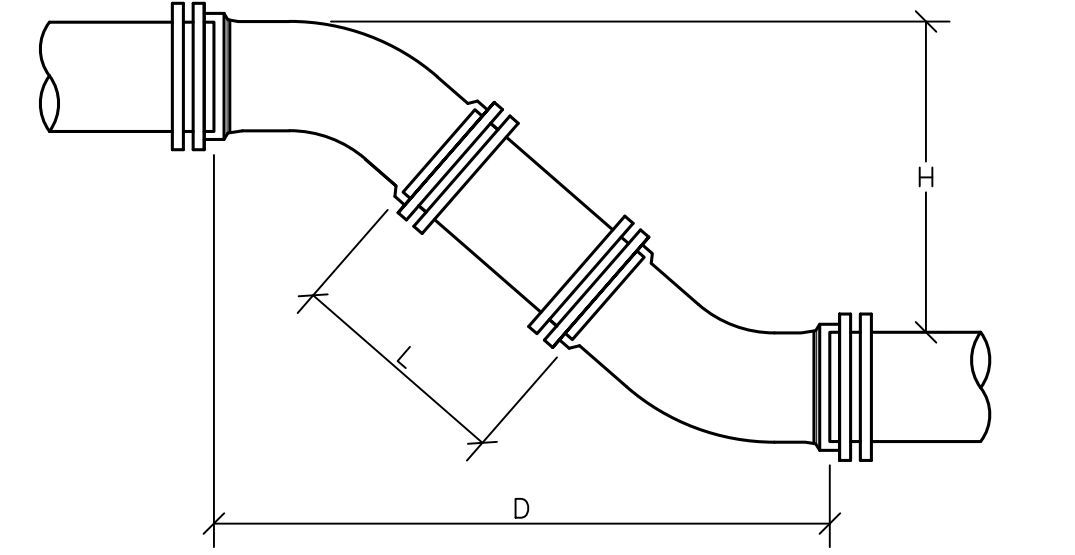
- TRENCH SECTION NOTES**
1. ALL ROADWAY PAVEMENT SHALL BE SAWCUT AND PLACED WITH A STREET PAVER.
 2. TACK COAT APPLIED TO ALL SAWCUT AND MILLED SURFACES.
 3. THE FINAL SAW CUTTING OF PAVEMENT SHALL BE PERFORMED AFTER BACKFILLING AND COMPACTION TO THE TOP OF THE EXISTING GRAVEL BASE IS COMPLETE.
 4. INSTALL BASE PAVEMENT TO MATCH EXISTING PAVEMENT GRADE IN 2023. TRENCH TO BE MILLED AND PAVED WITH 1.5" OF 9.5MM SURFACE HMA IN SPRING 2024.
 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.



TYPICAL SERVICE CONNECTION



TYPICAL MAIN OFFSET



H	6" PIPE		8" PIPE		12" PIPE	
	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"	0' 10-9/16"
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' 2"	2' 10-1/2"	1' 9"
24"	2' 6-1/2"	2' 3-7/16"	2' 7-1/2"	2' 3-7/16"	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' 6-3/16"	4' 2-1/2"	4' 5-3/16"	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"

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.

DRAWN BY: BSJ
DESIGN BY: AS
CHECKED BY: TM
DATE: 2/16/2023

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