CITY OF FARGO SPECIFICATIONS
SEWER AND WATER SERVICE CONNECTIONS

PART 1
DESCRIPTION OF WORK

The work to be done under this section of the Specifications and the accompanying plans consists of the furnishing of all labor, material, accessories and equipment necessary to construct sewer and water service connections. The work includes excavation, furnishing and laying sewer and water pipe according to these Specifications; protecting existing utilities and public and private property; testing all new water connections; backfilling trenches and other work as may be necessary to insure that the work be completed in accordance with these Specifications and the plans accompanying them.

PART 2
MATERIAL

2.1. SEWER SERVICE CONNECTIONS

2.1.1. PIPE

The material shall conform to "Standard Specifications for Rigid Polyvinyl Chloride Compounds", ASTM D-1784, Class 12454-B or 12454-C or 12364-C. The pipe shall be produced using a continuous extrusion process employing a prime grade of white unplasticized polyvinyl chloride.

All PVC pipe and specials shall be 6 inch diameter complying with the requirements of ASTM D-3034 PVC pipe, SDR 26 or Schedule 40 PVC. 4" PVC, when approved by the Engineer, shall be Schedule 40 PVC.

2.1.2. JOINTING

The joint system shall be an integral bell gasketed joint that forms a watertight seal in accordance with ASTM Specification D3212 and F477. If Schedule 40 is used, the joints shall be solvent weld, watertight and installed as per the manufacture recommendation.

2.1.3. WYES AND FITTINGS

Wyes and fittings shall be as manufactured by GPK Products, Inc. or approved equal. Gasketed wyes and fittings shall be used unless otherwise approved by the Engineer.

A. New construction: In-line wyes will be required on all new construction and shall be SDR 26.

B. When new taps are necessary on existing mains, PVC saddle wyes with a rubber gasket shall be used. The saddle wyes shall be installed as per the manufacturer's recommendation and attached with two stainless steel straps. Inserta- tees shall be installed by coring the existing sewer main, patching any openings and installing the Inserta-Tee. Inserta-Tees will only be allowed when approved by the Engineer.

C. When connecting to an existing clay main: Using care, the Contractor shall remove the entire wye branch down to the main and install a PVC saddle wye.

2.1.4. CONNECTIONS TO EXISTING SERVICE LINES

When connecting PVC to PVC, a gasketed, heavy wall PVC coupler shall be used. For all other connections between new and existing service lines, a flexible elastomeric PVC wrapped in a stainless steel shear ring shall be used. Approved products include Fernco Strong Back RC Series repair couplings, GPK couplings with stainless steel sheer rings, or approved equal.

2.1.5. MARKERS

For new construction projects, a marker shall be placed at the end of the sewer service. Markers shall be a 2" by 2" by 8-foot wood with the top 2 feet painted green. Marker shall extend from the cap at the end of the sewer service to 6' above the ground.

2.2. WATER SERVICE CONNECTIONS

All products (treatment chemicals and material) that may come into contact with water intended for use in a public water system shall meet American National Standards Institute (ANSI)/National Sanitation Foundation (NSF) International Standards 60 & 61, as appropriate. A product will be considered a meeting these standards if so certified by NSF, The Underwriters Laboratories, or other organizations accredited by ANSI to test and certify such products.

2.2.1. PIPE

All underground water service pipe 2 inches in diameter or smaller shall be type "K" copper or Cross-linked Polyethylene (PEX) pipe. Newly installed water service pipe shall be minimum of 1 inch in diameter. All water service pipe larger than 2 inches in diameter shall be manufactured in accordance with the latest revision of AWWA Standard C900 and be DR18.

PEX pipe shall meet the following criteria:

- Manufactured using high-pressure peroxide method of cross-linking.
- Manufactured to SDR9 copper tube sizes (CTS) according to ASTM F876, AWWA C904, and CSA B137.5.

- Certified to AWWA C904 Cross-linked Polyethylene (PEX) Pressure Pipe for Water Service
- Certified to CSA B137.5 Cross-linked Polyethylene (PEX) tubing for Pressure Applications
- Certified to NSF/ANSI Standards 14 and 61 (NSF-pw-g) for potable water applications
- Certified to PPI TR-3 Category 3306 for long-term hydrostatic strength, chlorine and UV resistance.
- Co-extruded UV Shield made from UV-resistant high-density polyethylene, color Blue.
- Minimum recommended UV exposure time of one (1) year when tested in accordance with ASTM F2657.
- Pressure-rated for continuous use at 200 psi @ 73.4 °F based on a 0.63 design factor.
- Minimum markings: PEXa 3306, CSA B137.5, ASTM F876, F2023 and F2080, NSF-pw.
- Approved by manufacturer for use with manual plastic pipe squeeze-off tools for temporary stoppage of flow.

2.2.2. JOINTS

Compression fittings shall be used for all water services 2 inches in diameter or smaller (copper and PEX). Compression fittings shall be Mueller 110 Compression, Ford Quick Joint, A.Y. McDonald McQuik, or approved equal.

Underground fittings and insert-stiffeners used with PEX pipe must comply with the material and performance requirements of ANSI/AWWA C800 and must be recommended for use by the fitting manufacturer for CTS SDR9 PEX pipe per the ANSI/AWWA C904 standard. Insert-stiffeners shall be stainless steel.

2.2.3. CORPORATION STOPS

Corporation stops shall be ball style such as Mueller B-250008N, Ford FB1000, McDonald 74701BQ, or approved equal.

2.2.4. CURB STOPS

Curb stops shall be ball style such as Mueller, Ford, McDonald, or approved equal ball valve with a copper tube size inlet and outlet. The arrow shall be placed in the direction of water flow. They shall be of the Minneapolis pattern type.

2.2.5. CURB BOXES

Curb boxes shall be A. Y. McDonald 5622C or approved equal. They shall be of the extension type with a Minneapolis pattern base and have an 8-foot bury length. A 6-inch extension with a threaded coupler shall also be supplied and installed. Boxes shall be made in the USA and furnished with a cast iron (not brass) plug threading into a cast iron cover (no brass insert).

2.2.6. MARKERS

For new construction projects, a 2" by 2" by 3-foot long wood marker shall be placed at the tail of the water service line and a 2" by 2" by 8-foot long wood marker with the top 2 feet painted blue or a metal "T" post painted blue shall be placed near the curb stop box. The tracer wire access point shall be securely taped to the marker near the curb stop box.

2.2.7. TRACER WIRE AND TRACER WIRE ACCESSORIES

Tracer wire and tracer wire accessories shall meet the requirements of Section 1300 2.11 and Section 1300 3.12. Tracer wire access points for water services shall be "SnakePit Lite Duty Access Point" with a blue, single-terminal cast iron lid or approved equal.

2.2.8. SERVICE CONNECTIONS

All service connections to PVC pipe shall be stainless steel, double bolt (minimum) service saddles. Service saddles shall have stainless steel washers between the nut and the plastic washer to equalize tightening stress. Rubber tapered gaskets shall be required to resist circumferential and longitudinal forces along with O-ring or flat gaskets for hydraulic seal. Saddle bolts shall be tightened to the manufacturers recommended tightness and verified with a torque wrench. Bolt tightness shall be rechecked with a torque wrench after the pipe tap is complete.

Service saddles shall be Romac style 306, Ford style FS 300, Powerseal 3412AS, Cascade CSC2, or approved equal.

PART 3
CONSTRUCTION

3.1. EXCAVATION, TRENCHING, AND BACKFILLING

Excavation, trenching and backfilling shall be done in accordance with Section #1000, with the following special considerations:

A. BACKFILLING- EARTH

Backfilling shall be commenced as soon as the connection has been measured and accepted by the Engineer. Special attention is called to the backfilling around the water pipe at the corporation. The earth shall be tamped as solidly as possible to prevent settlement that may cause a strain at this joint. Backfilling shall be done in layers of 6 inches or less and thoroughly compacted. No trench shall be left open for more than 48 hours.

B. BACKFILLING- GRAVEL

Backfilling shall be commenced as soon as the connection has been measured and accepted by the Engineer. Under this item, N. D. Class 3 (modified to 3-15% passing the number 200 sieve) gravel shall be used. The backfilled trench shall be compacted to 95% Standard Proctor Density

3.2. LOCATION AND GRADE

The Engineer will stake the locations of service connections to the main. Connections to the main sewer shall be made only to existing wyes. Wyes may be sprung in only with permission from the Engineer. No excavation for any connection shall be made until the location of the connection is determined and the line and grade established. The sewer grade shall not be less than 1/8 inch per foot and pipe shall be laid straight and to grade.

3.3. SEWER SERVICES

The bottom of the trench shall be excavated so that at least 1/3 of the circumference of the pipe shall have a firm bearing. Bell holes shall be dug to prevent damage to the pipe and prevent the pipe from resting on the bells. Vertical or nearly vertical risers from deep sewer mains shall be protected by tamping the earth around them in a manner that protects them from breaking. The ends of the pipe

shall be plugged during construction to prevent earth or other material from entering the pipe and closed with a plug or disc made from the same material as the pipe and properly secured to prevent its displacement. For new construction projects, the sanitary sewer service shall be installed and backfilled as the mainline sewer is installed and backfilled and all sewer services shall be low pressure air tested with the sewer main.

When encountered on the project, the Contractor shall determine whether a sewer service is active or inactive by televising, dye testing, or other methods approved by the Engineer.

3.3.1. Bored Sewer Services

When sewer services are bored or cored, the size of the bore hole shall be limited to 2" larger than the pipe size being installed. Care shall be taken to ensure that minimum grade is maintained on the sewer service.

3.4. WATER SERVICES

For connections made to the water main that are not made under city contract, all connections to water mains shall be made with a corporation stop furnished by the plumber and placed in the main by the City Water Department when it is desired to tap the water main.

For connections made to the water main under city contract, all materials and labor necessary to make the connection to the water main shall be furnished and installed by the Contractor at his expense.

All connections shall be laid in accordance with the ordinances of the City of Fargo and Water Department regulations governing the same. The water service line shall be laid in a wavy line in the trench and shall be of a length of at least 2 feet longer than the distance from the corporation to the curb stop. Tracer wire shall be securely fastened to the service laterals with tape or plastic ties at a minimum of 10 foot intervals. In addition, tracer wire shall be secured within 1 foot of all underground utility appurtenances. Water service pipes shall be installed as one continuous piece from the corporation stop to the curb stop and one continuous piece from the curb stop to the plug or one continuous piece from the curb stop to the connection to the existing service. At connections and fittings, use a plastic pipe cutter to ensure square (90 degree) and clean cuts for PEX pipe. Water services shall not be less than 7 1/2 feet below the finished street grade.

When connections are made to cast iron or ductile iron water main, the copper tubing shall be wrapped with polyethylene or dielectric tape for a minimum clear distance of 3 feet away from the main.

The water service pipe shall be looped at a 45-degree angle at the main into a gooseneck that shall be supported from displacement and settlement to prevent strain. The curb stops and curb boxes shall be furnished by the Contractor and shall be located and set as shown on the plans and details, as staked in the field and set to mid-height of adjustment. Any extensions required to achieve this shall be made with threaded couplers; no bolt-on extensions will be allowed.

As soon as the connection to the main is completed and prior to backfill, the corporation shall be opened and the connection examined for defects. All connections on the non-tested side of the curb stop or service valve shall pass visual inspection under city pressure by the Engineer in the field prior to backfilling. For new construction projects, if dry tap connections are made the water service shall be installed and backfilled as the water main is installed and backfilled.

All water services shall be pressure tested with the main. For new construction projects, the curb stops shall be open and the water services shall be pressure tested from the main to a Contractor supplied cap or plug at the end of the service.

The City Water Department will be checking all curb stop boxes for height adjustment and straightness at the end of the project. If defects are discovered, the Contractor shall make necessary repairs at his expense.

3.4.1. Bored Water Services

When water services are bored or cored, the size of the borehole shall be limited to 2" larger than the pipe size being installed.

3.5. RIGHT OF PROPERTY OWNER TO INSTALL SERVICE

Property owners have the legal right, within a specified period, to cause sewer and water connections to be made as required by these Specifications, and reductions in the quantities may therefore result.

3.6. RECORDS TO BE KEPT

As soon as the sewer and water pipe have been properly laid in place and connections made, the length, depth, and location of the service pipe shall be ascertained and a record made by the Engineer. No work shall be paid for unless such measurements have been made.

3.7. FINAL INSPECTION

The Contractor and the City of Fargo representative will operate all main valves and inspect all stop boxes for access. This procedure will be accomplished after all clean up, etc. has been completed. This inspection will be made prior to the final payment for work performed. Any defects shall be promptly repaired by the Contractor at his cost.

PART 4
GUARANTEE, MEASUREMENT & PAYMENT

4.1. GUARANTEE

The guarantee shall be per the contract.

4.2. MEASUREMENT AND PAYMENT

All costs for removal of replaced materials shall be included in the contract unit price of the material being installed as the replacement.

4.2.1. GENERAL

The cost of excavation, trenching, and backfill shall be included as part of this specification.

4.2.2. SEWER SERVICES

The Contractor will not be paid for any sewer service repairs which are caused by his carelessness and/or negligence.

4.2.2.A. Pipe will be paid at the contract unit price per linear foot installed, including riser length if applicable, and will be measured from the center of the sewer main to either the point of connection to the existing service line or the end of the new service line. The contract unit price for service pipe shall include all costs for required bends.

1. Bored Sewer Services: The contract unit price for boring shall include the cost of the bore and the pipe/tubing for the length of the bore. Where services shown to be open-cut on the plans are bored as a more feasible option, payment will be made on the open-cut bid item.

4.2.2.B. Sewer service connections will be paid as follows:

1. New construction: The connect sewer service bid item shall include all costs to furnish and install the in-line wye, plug, and marker.

2. Sewer main replacement without service line replacement: The connect sewer service bid item shall include all costs to furnish and install an in-line wye, a short piece of new service pipe between the existing service pipe and the new in-line wye, and an approved coupler to connect the existing service line to the short piece of new service pipe.

3. Sewer service replacement without sewer main replacement: The connect sewer service bid item shall include all costs to furnish and install a new PVC saddle wye and an approved coupler to connect the existing service line to the new service line.

4. Sewer service replacement with sewer main replacement: The connect sewer service bid item shall include all costs to furnish and install a new in-line wye and an approved coupler to connect the existing service line to the new service line.

4.2.3. WATER SERVICES

4.2.3.A. Pipe/tubing will be paid at the contract unit price per linear foot, and will be measured in a straight line horizontally from the centerline of the water main to either the point of connection to the existing service line or the end of the new service line. No additional footage will be added to install the service in a wavy line.

1. Bored Water Services: The contract unit price for boring shall include the cost of the bore and the pipe/tubing for the length of the bore. Where services shown to be open-cut on the plans are bored as a more feasible option, payment will be made on the open-cut bid item.

4.2.3.B. Water service connections will be paid per each and shall include the following:

1. New construction: The connect water service bid item shall include all costs to furnish and install the stainless steel saddle and corporation stop. The curb stop and box bid item shall include all costs to furnish and install the curb stop, curb stop box, markers, and cap or plug.

2. Water main replacement: The connect water service bid item shall include all cost to furnish and install the stainless steel saddle, corporation stop, and any service fittings necessary to reconnect the existing water service. If the existing water service is shown to be replaced from the main through the curb stop, the curb stop and box will be paid for under the curb stop and box bid item.

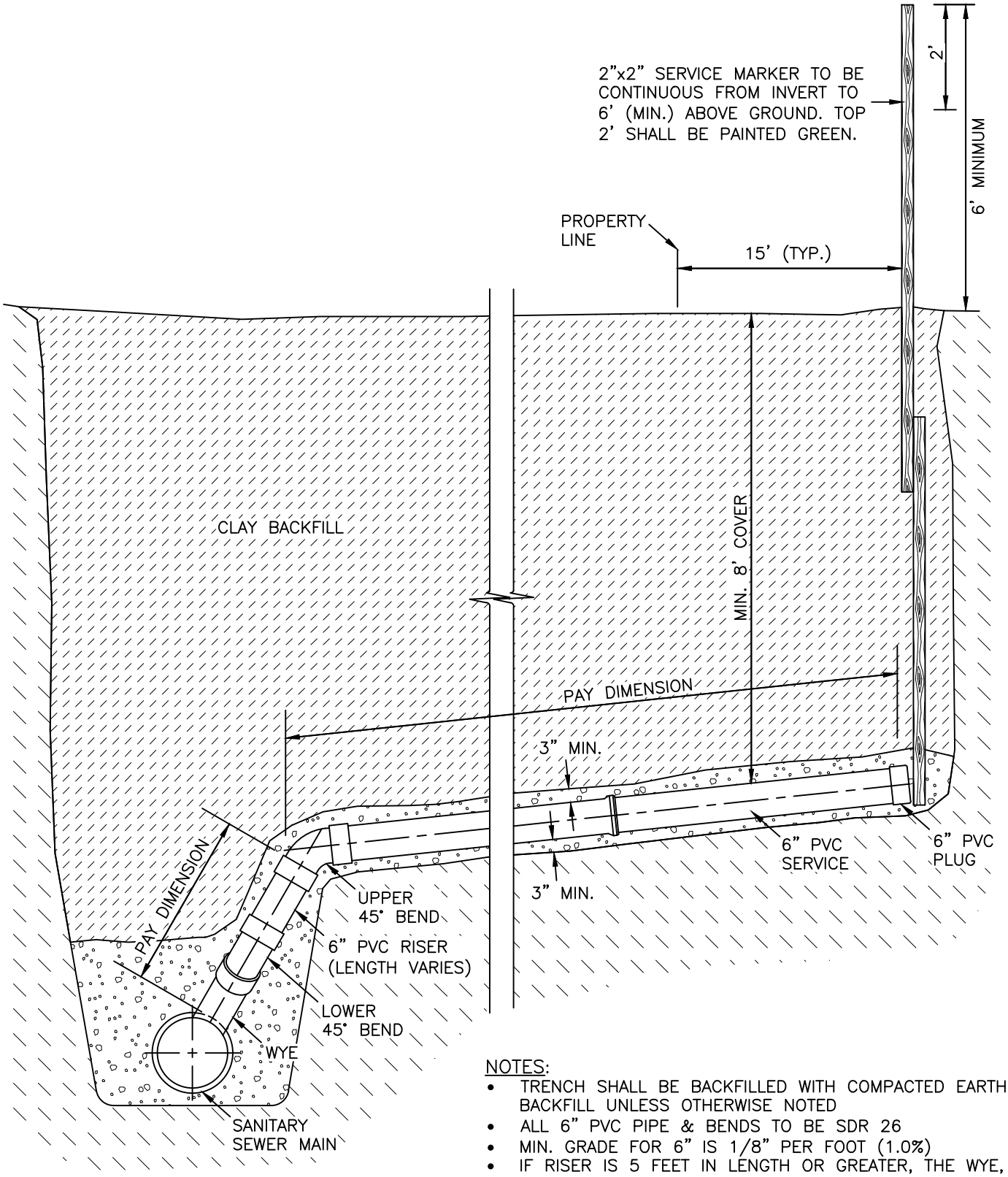
On city contracts, the Contractor shall perform all live taps for services 2" and smaller. For live service taps larger than 2" only the City Water Department will be allowed to perform the tap unless authorized by the City Water Department Supervisor.

For live service taps larger than 1" that are not made under city contract, only the City Water Department will be allowed to perform the tap and the Contractor will be billed for the tap by the City Water Department.

The tracer wire and tracer wire accessories, electrical conductivity testing, and pressure testing shall be considered incidental to water service construction.

4.2.4. OTHER COSTS

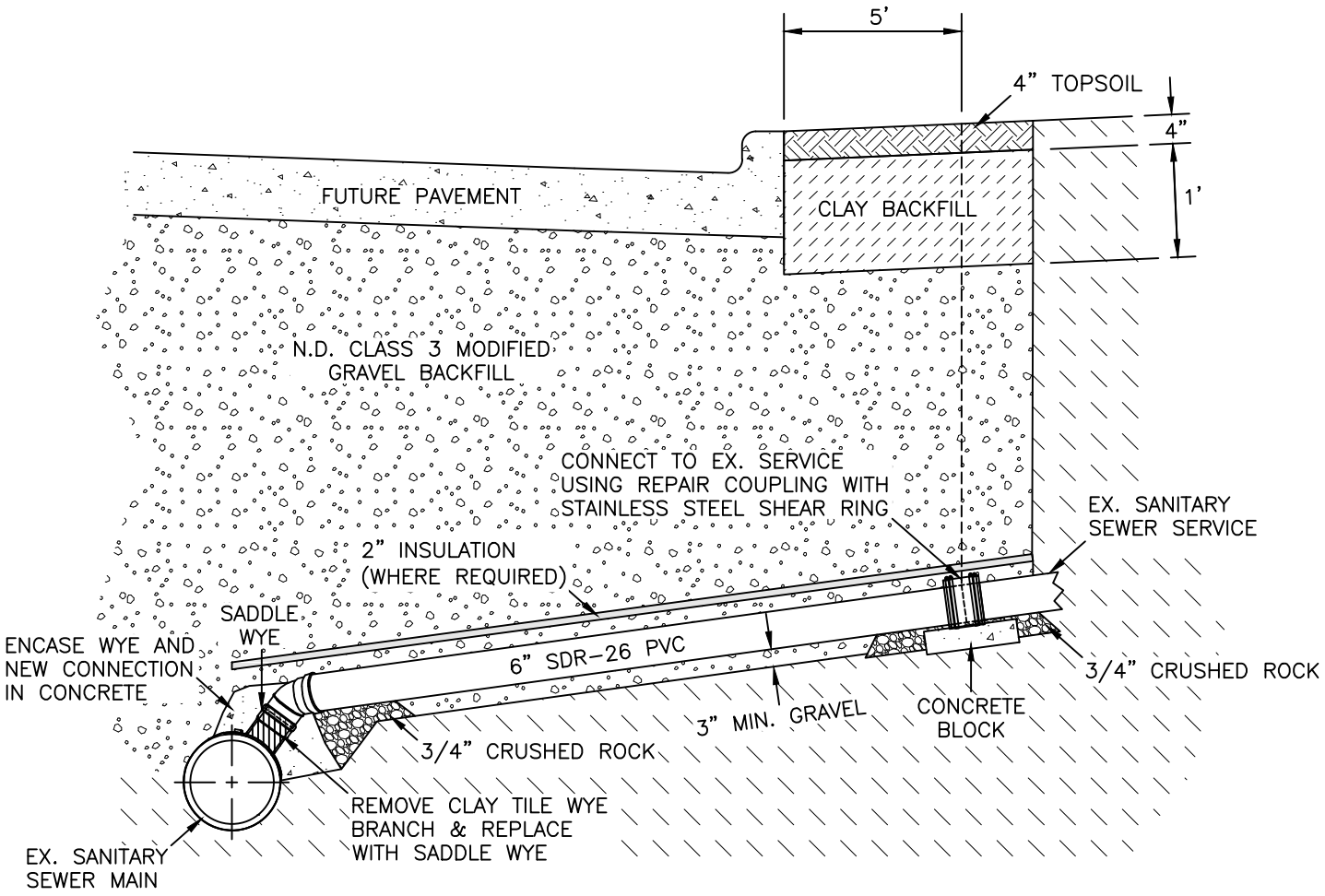
All other costs for work necessary to properly complete the work specified herein shall not be bid items; the costs shall be charged to other items unless a bid item is specifically included on the bid sheet.



NOTES:

- TRENCH SHALL BE BACKFILLED WITH COMPACTED EARTH BACKFILL UNLESS OTHERWISE NOTED
- ALL 6" PVC PIPE & BENDS TO BE SDR 26
- MIN. GRADE FOR 6" IS 1/8" PER FOOT (1.0%)
- IF RISER IS 5 FEET IN LENGTH OR GREATER, THE WYE, WYE BEND, AND LOWER BEND SHALL BE SUPPORTED WITH 1−1/4" CRUSHED ROCK ENCASEMENT

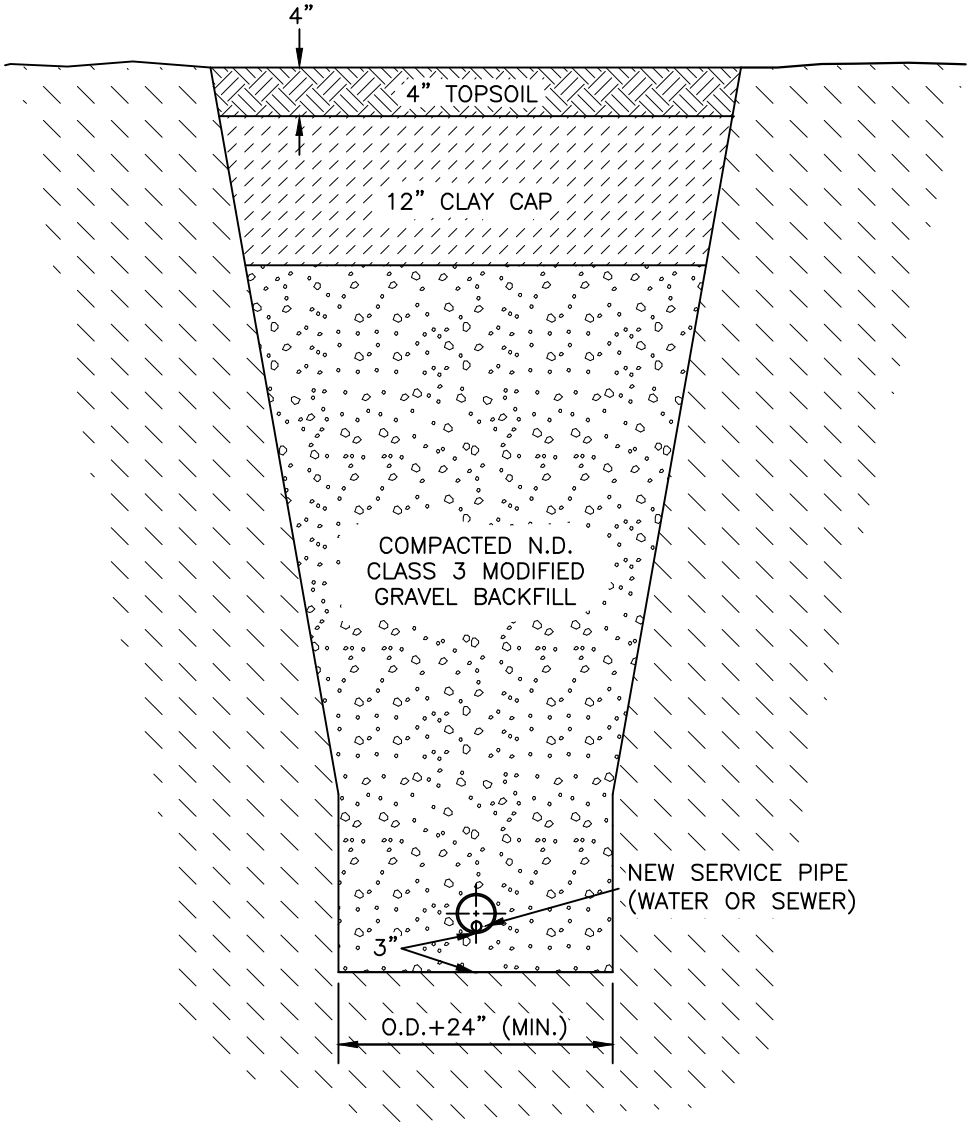
THE CITY OF Fargo FAR MORE ENGINEERING DEPARTMENT	SECTION: 1400	DRAWING: 5.1
	REVISION: 2019	
	SANITARY SERVICE FOR NEW INSTALLATION	
	APPROVED:	DATE:



NOTES:

- INSULATION REQUIRED WHERE SERVICE IS LESS THAN 7' DEEP.
- PIPES SHALL BE BUTTED TOGETHER WITH REPAIR COUPLING CENTERED ON BUTT-JOINT.
- INSTALL 12" CLAY CAP BELOW FUTURE AGG. BASE IF SERVICE IS INSTALLED UNDER FUTURE PAVING WITH EDGE DRAIN.

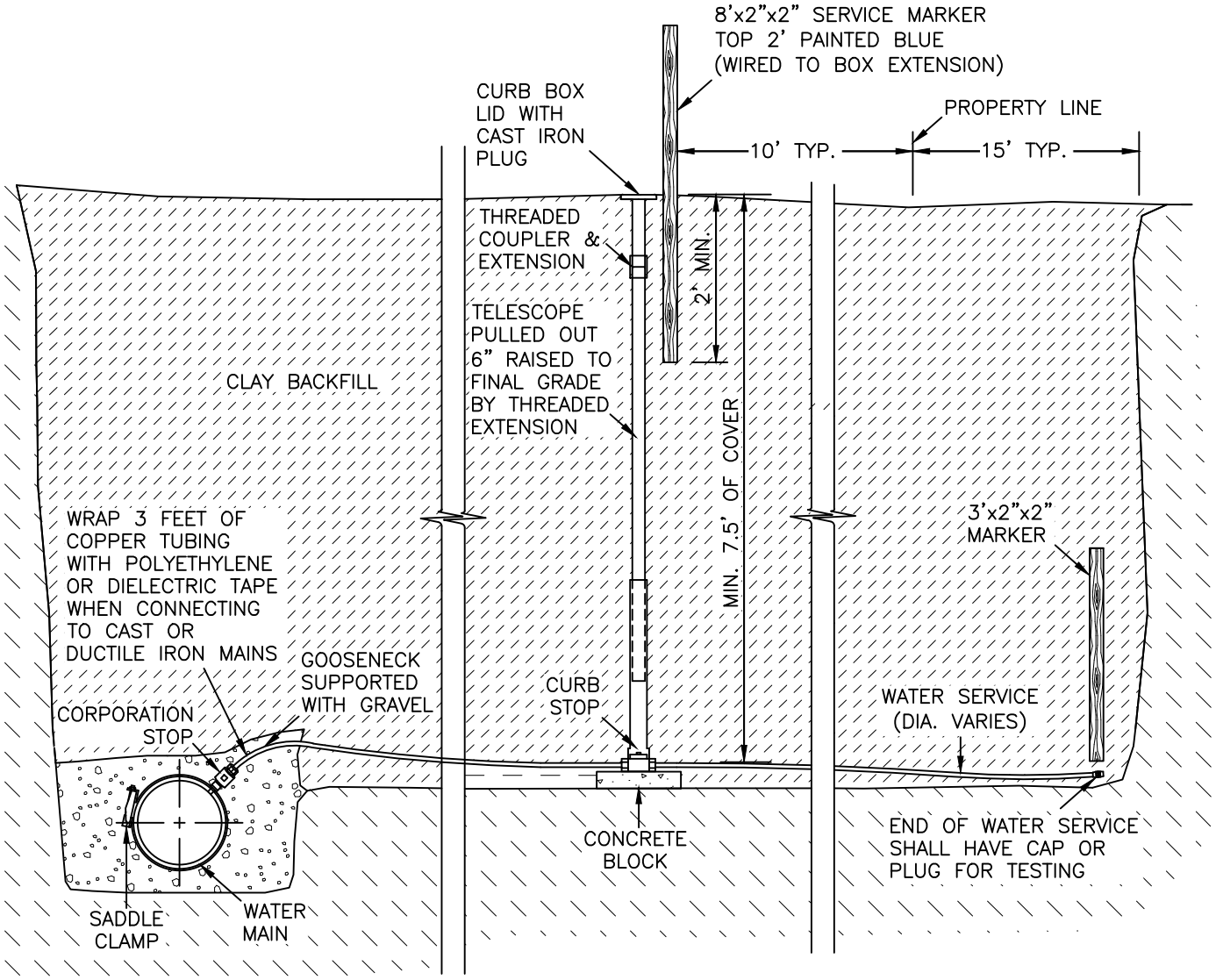
THE CITY OF Fargo FAR MORE ENGINEERING DEPARTMENT	SECTION: 1400	DRAWING: 5.2
	REVISION: 2019	
	SANITARY SEWER SERVICE REPLACEMENT	
	APPROVED:	DATE:



NOTES:

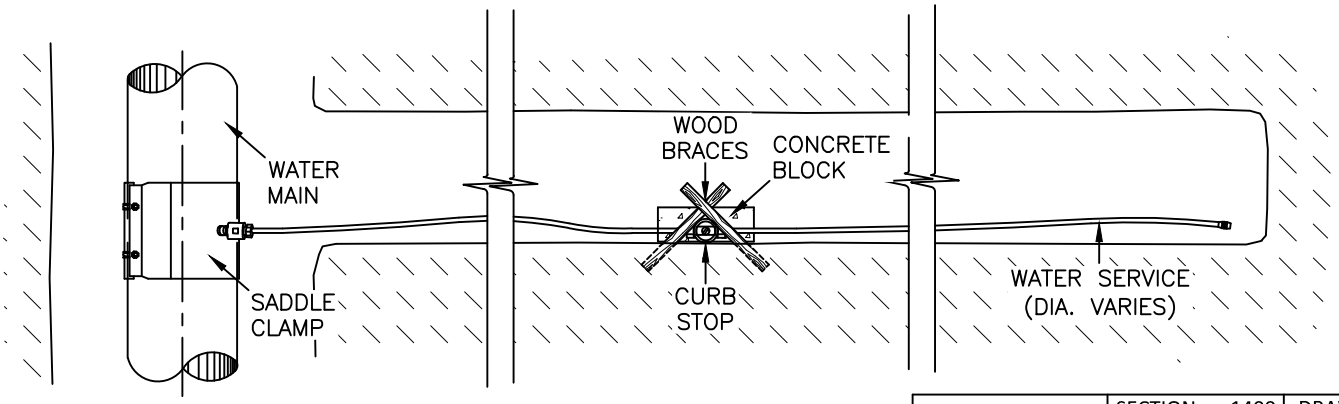
- THIS DETAIL APPLIES IN REHABILITATION AREAS WHERE WATER OR SEWER SERVICE IS REPLACED BETWEEN THE CURB AND PROPERTY LINE.
- FOR SANITARY SEWER SERVICE TRENCH UNDER CONCRETE ROADWAY SEE SECTION 1200 DETAILS.
- FOR WATER SERVICE TRENCH UNDER CONCRETE ROADWAY SEE SECTION 1300 DETAILS.

THE CITY OF Fargo FAR MORE ENGINEERING DEPARTMENT	SECTION: 1400	DRAWING: 5.3
	REVISION: 2019	
	REPLACEMENT PROJECT SERVICE TRENCH (BLVD)	
	APPROVED:	DATE:



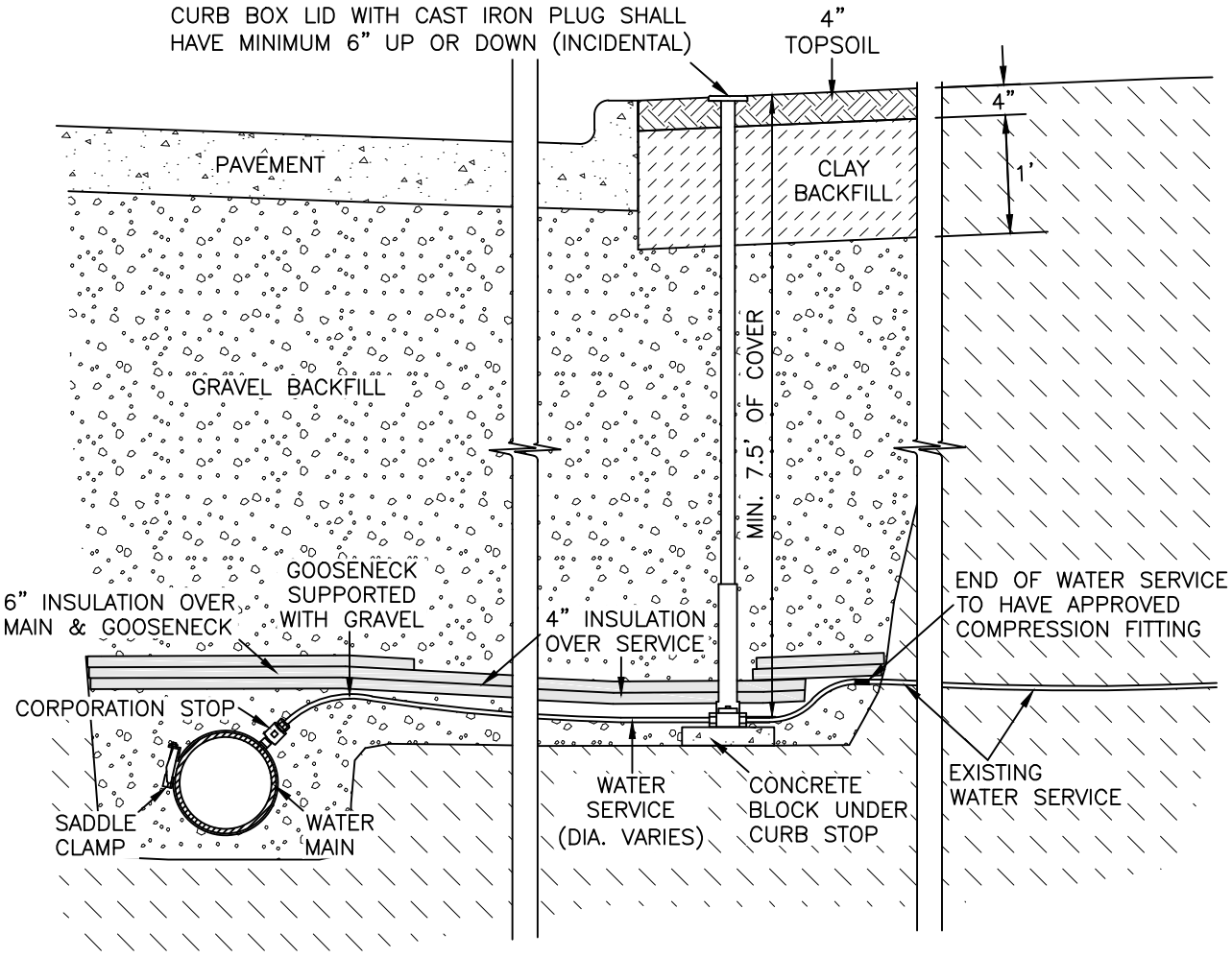
NOTES:

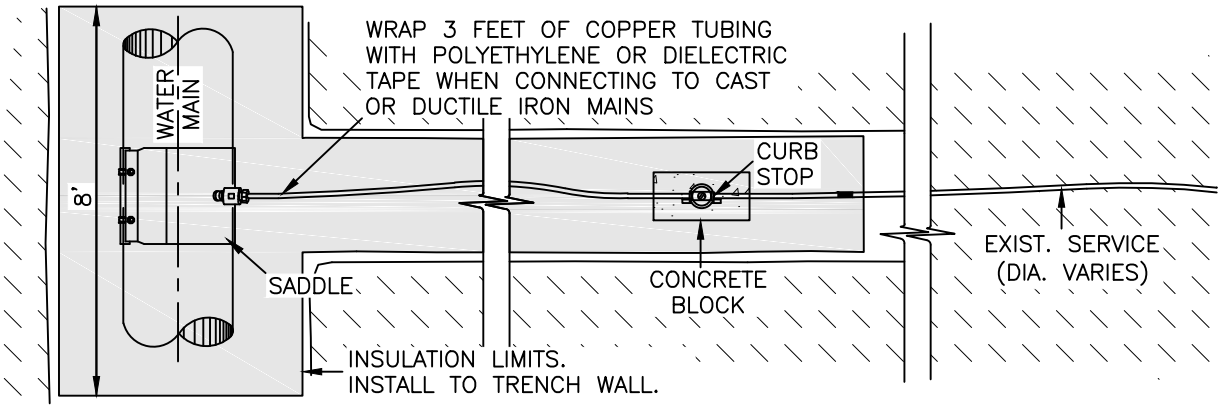
- CURB STOP SHALL BE PLACED ON CONCRETE BLOCK ON UNDISTURBED GROUND
- STOP BOX TO BE INSTALLED ALONG SIDE OF TRENCH AND SUPPORTED TO THE TRENCH WALL WITH TWO WOODEN BRACES TO PROVIDE SUPPORT DURING BACKFILL.
- REFER TO DETAIL 1400–5.6 FOR TRACER WIRE AND TRACER WIRE ACCESS POINT DETAILS.



THE CITY OF Fargo FAR MORE
ENGINEERING DEPARTMENT

SECTION: 1400	DRAWING: 5.4
REVISION: 2019	
WATER SERVICE FOR NEW INSTALLATIONS	
APPROVED:	DATE:





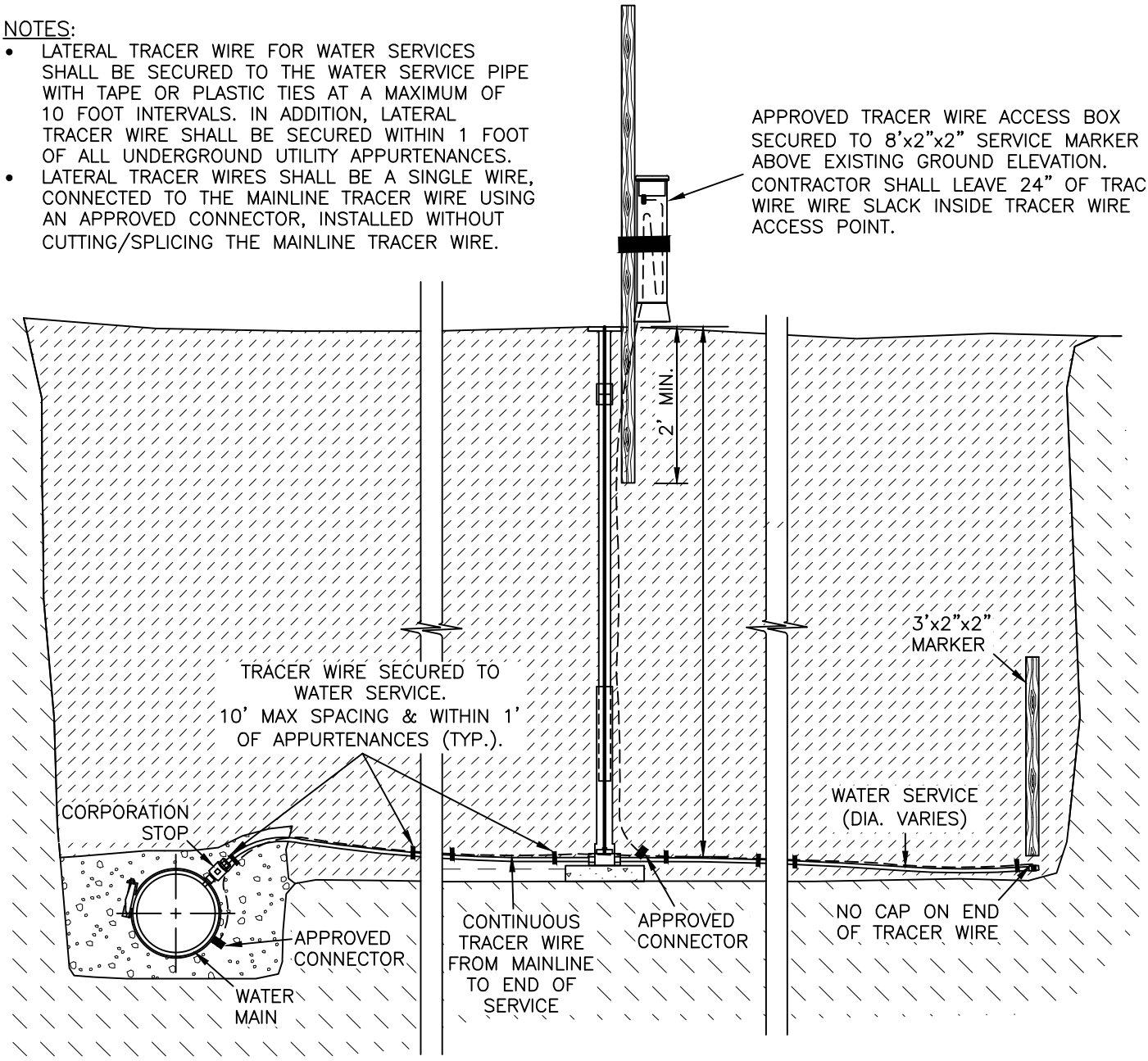
NOTES:

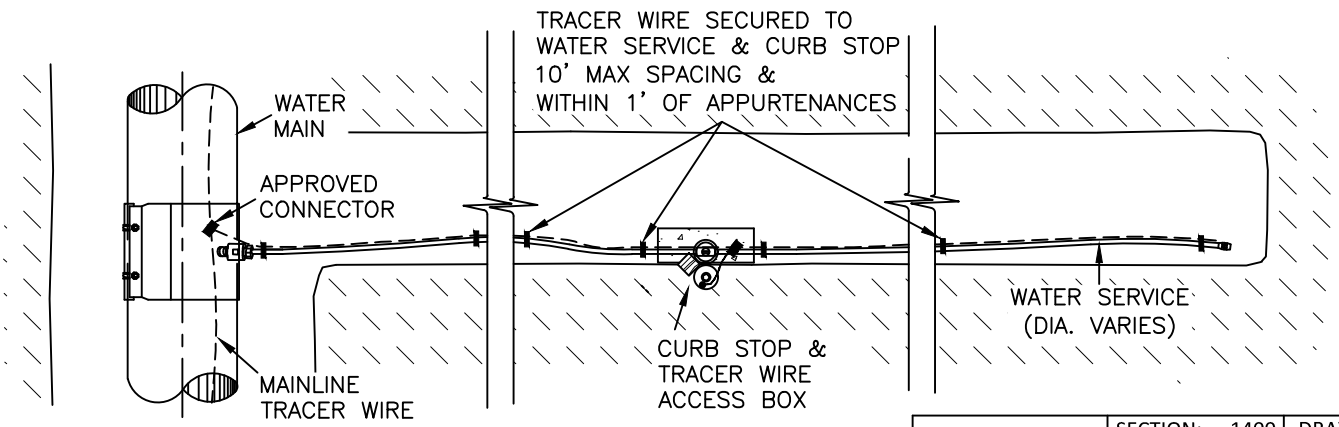
- CURB STOP TO BE PLACED ON A CONCRETE BLOCK.
- ALL INSULATION IS INCIDENTAL TO SERVICE PIPE.
- ALL INSULATION BOARDS SHALL BE 2" THICK, STACKED TO ACHIEVE TOTAL THICKNESS DESIRED.
- WHEN STACKING INSULATION BOARDS, STAGGER EACH LAYER SUCH THAT ALL BUTT JOINTS ARE OVERLAPPED BY THE LAYER ABOVE.
- REFER TO DETAIL 1400–5.7 FOR TRACER WIRE AND TRACER WIRE ACCESS POINT DETAILS.
- INSTALL 12" CLAY CAP BELOW FUTURE AGG. BASE IF SERVICE IS INSTALLED UNDER FUTURE PAVING WITH EDGE DRAIN.

THE CITY OF Fargo FAR MORE ENGINEERING DEPARTMENT	SECTION: 1400	DRAWING: 5.5
	REVISION: 2019	
	WATER SERVICE FOR REPLACEMENT PROJECTS	
	APPROVED:	DATE:

NOTES:

- LATERAL TRACER WIRE FOR WATER SERVICES SHALL BE SECURED TO THE WATER SERVICE PIPE WITH TAPE OR PLASTIC TIES AT A MAXIMUM OF 10 FOOT INTERVALS. IN ADDITION, LATERAL TRACER WIRE SHALL BE SECURED WITHIN 1 FOOT OF ALL UNDERGROUND UTILITY APPURTENANCES.
- LATERAL TRACER WIRES SHALL BE A SINGLE WIRE, CONNECTED TO THE MAINLINE TRACER WIRE USING AN APPROVED CONNECTOR, INSTALLED WITHOUT CUTTING/SPLICING THE MAINLINE TRACER WIRE.

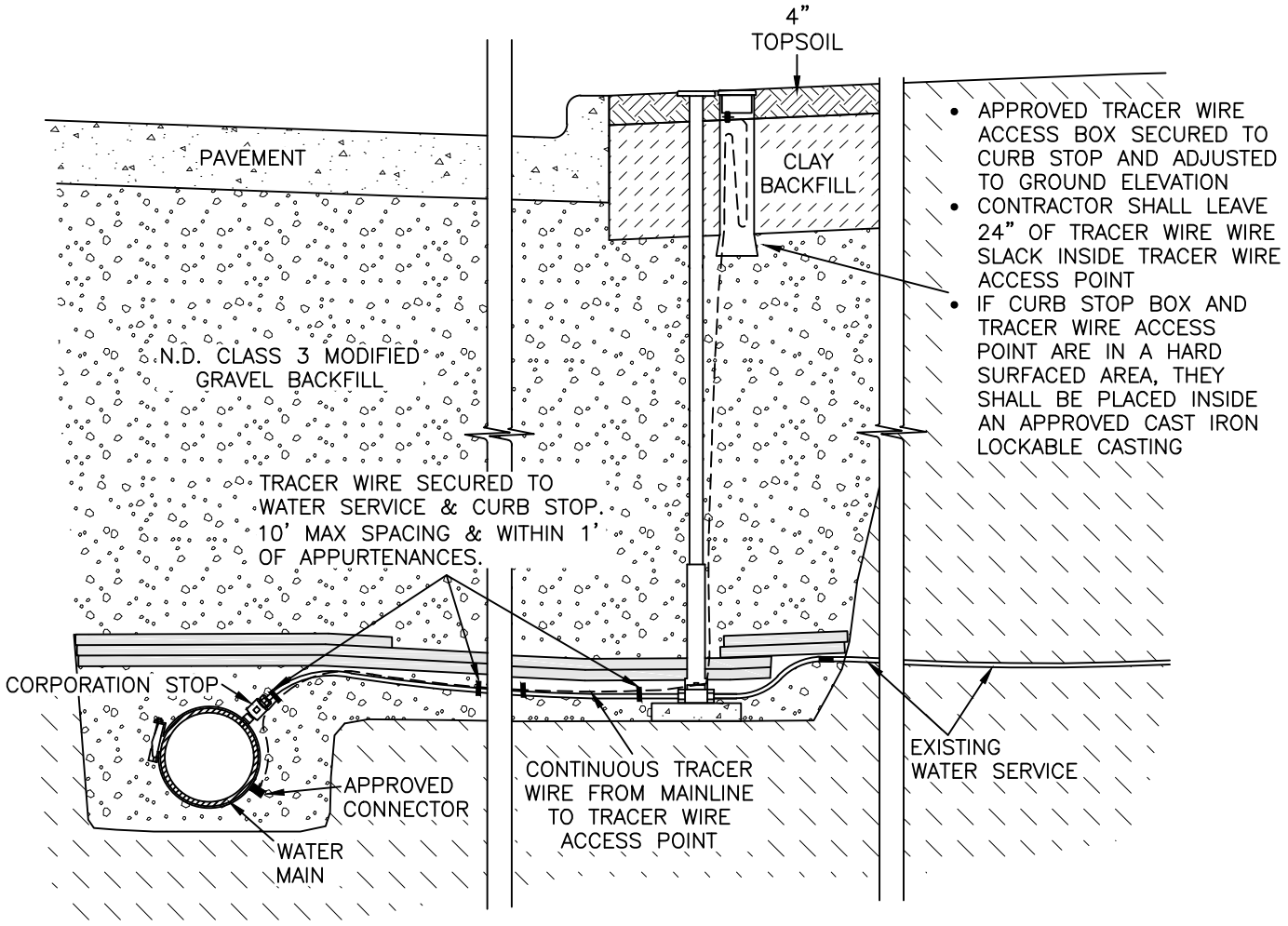


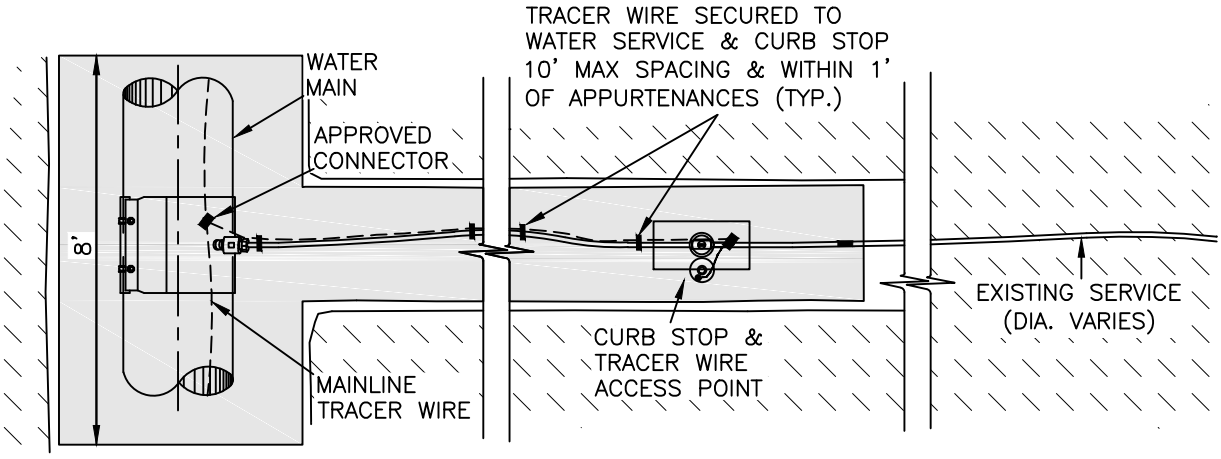


THE CITY OF Fargo FAR MORE

ENGINEERING DEPARTMENT

SECTION: 1400	DRAWING: 5.6
REVISION: 2019	
NEW WATER SERVICE TRACER WIRE DETAIL	
APPROVED:	DATE:





NOTES:

- LATERAL TRACER WIRE FOR WATER SERVICES SHALL BE SECURED TO THE WATER SERVICE PIPE WITH TAPE OR PLASTIC TIES AT A MAXIMUM OF 10 FOOT INTERVALS. IN ADDITION, LATERAL TRACER WIRE SHALL BE SECURED WITHIN 1 FOOT OF ALL UNDERGROUND UTILITY APPURTENANCES.
- LATERAL TRACER WIRES SHALL BE A SINGLE WIRE, CONNECTED TO THE MAINLINE TRACER WIRE USING AN APPROVED CONNECTOR, INSTALLED WITHOUT CUTTING/SPLICING THE MAINLINE TRACER WIRE.

THE CITY OF Fargo FAR MORE ENGINEERING DEPARTMENT	SECTION: 1400	DRAWING: 5.7
	REVISION: 2019	
	REPLACEMENT W.S. TRACER WIRE DETAIL	
	APPROVED:	DATE: