

SECTION 300 WATERMAIN

301.0 DESCRIPTION

Water main installation shall be performed in accordance with the provisions of the latest published edition of the MnDOT Standard Specifications and the City Engineers Association of Minnesota (CEAM) Standard Specifications, 2018 Edition, except as modified herein.

All materials must be domestically manufactured in the U.S.A.

302.0 MATERIALS

302.1 PIPE AND FITTINGS

302.1.1 WATERMAIN PIPE AND FITTINGS

All pipe furnished for watermain and branch line installations shall be of the type, kind, size and class indicated on the Drawings and designated in the Contract Documents. Wherever connection of dissimilar materials or designs is required, the method of joining and any special fittings employed shall be subject to approval of the Engineer. All fittings, valves, and hydrants shall be secured utilizing Cor-Blue bolts.

a. DUCTILE IRON PIPE (DIP)

The pipe shall be cement lined class 52, ductile iron with mechanical or push-on joints and shall conform to the requirements of ASA A-25.51 (Ductile Iron Pipe Centrifugally Cast in Metal Molds of Sand-Lined Molds).

Fittings for ductile iron pipe shall be ductile iron, have a minimum working pressure rating of 150 psi and shall conform to the requirement of AWWA C153 (ANSI 21.53) Ductile Iron Compact Fittings, unless otherwise approved by the Engineer. All sleeve fittings shall be long mechanical joint.

b. POLYVINYL CHLORIDE PIPE (PVC)

The pipe and fittings furnished shall be of the Polyvinyl Chloride Pipe (PVC) type as specified for each particular use or installation.

PVC pipe for watermain shall conform to AWWA C900 for pipe sizes 4 to 12 inches and AWWA C905 for pipe sizes 14 to 24 inches. All pipes shall have a minimum dimension ratio (DR) of 18 corresponding to a working pressure of 235 psi for PVC type 1120 pipe. In addition, the pipe shall comply with the following supplementary provisions:

1. Restraints for C900 and C905 PVC pipe shall be Ebba Iron Series 2000PV, Uni-Flange Series 1350C, 1390C, 1500, or approved equal.
2. Services shall be installed with all stainless steel saddles such as Smith- Blair 372, Ford FS303, Cascade CS22, or approved equal for six up through 24 inches in size. Payment for stainless steel saddles will be incidental to the cost of the service tap.
3. All PVC pipe used for potable water lines shall be blue in color, manufactured within the past 12 months as determined from the date stamp on the pipe, and free of defects.
4. All pipes shall be marked with the manufacturer's name, date, nominal size, type of plastic and pressure rating. Pipe O.D. shall be equivalent to ductile iron pipe of the same nominal size.

Fittings shall conform to AWWA C907 and C908, unless otherwise approved by the Engineer.

c. **HIGH DENSITY POLYETHYLENE PIPE (HDPE)**

Polyethylene plastic pressure pipe shall comply with the following supplementary provisions:

1. The pipe material shall be extra high molecular weight, high density polyethylene (EHMW-HDPE, PE3408) conforming with the minimum structural standards of ASTM D3350 with cell classification 345434C as manufactured by Chevron Phillips Chemical Company 4000/4100 Series, or equal. All HDPE pipe material shall meet the requirements of ASTM D1248 for a Type III, Class C, Category 5, Grade P34.
2. The pipe to be used shall be (HDPE) pressure pipe conforming to the requirement of AWWA C-906 of a 160 psi working pressure. The grade used shall be resistant to aggressive soils or corrosive substances present. Unless otherwise specified, the dimensions and tolerances of the pipe barrel should conform to ductile iron pipe equivalent outside diameters.
3. The dimension ratio (DR) shall be 11.

Fittings shall conform to the requirements of AWWA C906, unless otherwise approved by the Engineer. Fittings shall be ductile iron when connecting to ductile iron pipe.

302.1.2 WATER SERVICE PIPE AND FITTINGS

One (1) inch tap service lines shall be installed as the minimum standard wherever another size is not specified on the Drawings or in the Contract Documents. Water service pipe requirements shall conform to the requirements of ASTM B 88 for Seamless Copper Water Tube, Type K, Soft Annealed temper.

302.2 HYDRANTS

Hydrants shall be Clow Medallion with a five inch steamer port Storz connection, with two base nozzle connections 2-1/2 inch National Standard Thread, 7-1/2 to the inch and one pumper nozzle with 4-1/2 inch National Standard Thread, 4 to the inch.

Hydrants must have a six (6) inch mechanical joint inlet and five (5) inch valve opening.

Hydrants shall be break-off type with breakable ground line flange and with bronze lower plate or approved equal. The breakoff section shall be 16 inches in height.

The centerline of the traffic flange shall be zero to six (6) inches above ground.

Each hydrant shall have a five (5) foot red/white reflective hydrant marker installed on it. Cost of this marker shall be incidental to the cost of a new hydrant with no direct compensation thereof.

Hydrants shall be sufficient length to provide a minimum 7.5 foot bury depth unless otherwise noted on Drawings, and so that the centerline of nozzles is 24 to 36 inches above the finished grade

All hydrants furnished must have a standard 10-year warranty certified by the manufacturer.

302.3 VALVES, BOXES AND VALVE MANHOLES

302.3.1 GATE VALVES

Upon request, three (3) certified copies of the performance tests complying with Section 5 of AWWA C515 or Section 6 of AWWA C515 shall be submitted to the Engineer.

All valves shall be Resilient Wedge valves as manufactured by Clow Corporation. The valves shall meet all applicable requirements of AWWA Specification C515. The bonding process

for bonding Styrene Butadiene rubber to the cast iron wedge shall meet ASTM tests for rubber-to-metal bond, ASTM D429-73.

All gate valves twelve (12) inches or larger in size shall be equipped with approved barrel type rugged gate position indicators.

302.3.2 VALVE BOXES

Valve boxes shall be ductile iron, buffalo-type adjustable. Valve boxes shall be provided for 7.5 feet of cover, except where greater depths are indicated on the profiles of the Drawings.

Valve boxes shall be at least three pieces with sufficient adjustment to provide at least six (6) inches of adjustment above and below grade. Adjustments for depths greater than six (6) inches shall be incidental and no payment made therefore.

Valve box stabilizers manufactured by Adaptor Inc., or approved equal, shall be installed on all gate valves.

Valve boxes shall have a cover that has the word WATER cast thereon.

302.3.3 AIR RELIEF VALVE AND VALVE MANHOLE

Air relief valve and manhole shall be installed as shown on the Drawings. Valves larger than 12 inches in diameter shall be placed in manholes or as noted in the Drawings. Manholes shall meet the requirements of the details in the Drawings and the requirements specified in the Storm Sewer Specifications. Manhole frames and covers shall be equal to Neenah R-1733 with WATER stamped on the cover.

302.3.4 CORPORATION STOPS

Corporations	Mueller Model H-15000 Ford F-600 A.Y. McDonald 4701
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302.3.5 CURB STOPS AND BOXES

Curb Stops	Mueller Model H-15154 Ford B22 A.Y. McDonald 6104
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Curb Box	8 ft- 6 inch Minneapolis Pattern Base with foot piece, minimum 1-1/2 inch riser pipe
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Curb stops 1 1/2 inch and larger require 2 inch minimum riser pipe.

302.4 TRACER WIRE

Tracer wire shall be installed on any non-conductive casing, main or service pipe. All trace wire and trace wire products must be domestically manufactured in the U.S.A. and will have HDPE insulation intended for direct bury, color coated per APWA standard for the specific utility being marked.

302.4.1 TRACE WIRE

Open Trench – Trace wire will be #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.

302.4.2 CONNECTORS

All mainline trace wires must be interconnected in intersections, at mainline tees and mainline crosses. At tees, the three wires will be joined using a single 3-way lockable connector. At Crosses, the four wires will be joined using a 4-way connector. Use of two 3-way connectors with a short jumper wire between them is an acceptable alternative.

- a. Direct bury wire connectors – will include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground trace wire installation. Connectors must be dielectric silicon filled to seal out moisture and corrosion, and must be installed in a manner so as to prevent any uninsulated wire exposure.
- b. Non locking friction fit, twist on or taped connectors are prohibited.

302.4.3 TERMINATION/ ACCESS

All trace wire termination points must utilize an approved trace wire access box (above ground access box or grade level/in-ground access box as applicable), specifically manufactured for this purpose. Approved products are:

- a. Termination/Access Non-Roadway access box applications: Trace wire access boxes Grade level Copperhead adjustable lite duty Part # LD14*TP
- b. Concrete/Driveway access box applications: Trace wire access boxes Grade level Copperhead Part # CD14*TP 14”
- c. Fire hydrant trace wire access box applications: Above ground two terminal 1 inch conduit. Copperhead part # T3-75-F (Cobra T3 Test Station, denoting “F” includes mounting flange)
- d. All grade level/in-ground access boxes must be appropriately identified with SEWER or WATER cast into the cap and be color coded.

A minimum of two (2) feet of excess/slack wire is required in all trace wire access boxes after meeting final elevation.

All trace wire access boxes must include a manually interruptible conductive/connective link between the terminal(s) for the trace wire connection and the terminal for the grounding anode wire connection.

Grounding anode wire must be connected to the identified (or bottom) terminal on all access boxes.

Service Laterals on public property - Trace wire must terminate at an approved grade level/in-ground trace wire access box, located at the edge of the road right-of-way, and out of the roadway.

Service laterals on private property - Trace wire must terminate at an approved above-ground trace wire access box, affixed to the building exterior directly above where the utility enters the building, at an elevation not greater than 5 vertical feet above finished grade, or terminate at an approved grade level/in-ground trace wire access box, located within 2 linear feet of the building being served by the utility.

Hydrants – Trace wire must terminate at an approved above-ground trace wire access box, properly affixed to the hydrant grade flange. (affixing with tape or plastic ties will not be acceptable)

Long-runs, in excess of 500 linear feet without service laterals or hydrants - Trace wire access must be provided utilizing an approved grade level/in-ground trace wire access box, located at the edge of the road right-of-way, and out of the roadway. The grade level/in-ground trace

wire access box will be delineated using a minimum 48 inch polyethylene marker post, color coded per APWA standard for the specific utility being marked.

303.0 CONSTRUCTION REQUIREMENTS

The Contractor must make all changes in the water supply systems indicated in the Plans and Specifications or as directed by the Engineer in accordance with the requirements of the Minnesota Department of Health, and the applicable requirements of the American Water Works Association.

303.1 INSPECTION AND RESPONSIBILITY OF MATERIALS

The Contractor shall be responsible for all Contractor furnished material and all such material that is found to be defective in manufacture or that has become damaged in handling after delivery by the manufacturer shall be replaced at the Contractor's own expense. This shall include the furnishing of all material and labor required for the replacement of installed material discovered defective prior to the final acceptance of the work.

303.2 WATER SHUT OFF- NOTIFICATION TO PROPERTY OWNERS

The Contractor shall provide the Project Representative a minimum of 24 hours' notice on all requests to shut down water mains. Disruption of service shall be during the time of day when the least inconvenience will be caused to the property owners.

During construction, when it becomes necessary to turn off or plug water mains, the Contractor will notify all consumers affected by such operation at least 24 hours in advance whenever possible and advise them of the probable time when service shall be restored. This letter must be reviewed and approved by the Project Coordinator prior to notifying the property owners.

The City's Utility Division is the only entity which can turn valves related to the water main shut off and energizing.

303.3 REMOVALS

303.3.1 REMOVE WATERMAIN PIPE

This item shall include all labor and materials to remove and dispose of all watermain pipes on the project regardless of size. Also included are the removal of all fittings and gate valves located along the alignment of the pipe designated for removal.

303.3.2 SALVAGE HYDRANT

The hydrants indicated for salvage shall be removed, and, unless marked for reuse on the Drawings, delivered to the Municipal Service Center at 7305 Oxford Street. This work shall be coordinated with the Project Coordinator.

303.4 PIPE LAYING OPERATIONS

No deviation from the required line or grade will be allowed except with the consent of the Engineer.

No pipe material shall be laid in water nor when the trench or bedding conditions are otherwise unsuitable or improper.

The watermain shall generally be placed with 7.5 feet of cover. However, a slightly greater depth may be required to clear existing storm and sanitary sewers and sewer services. Accordingly, the pipe will be laid to the depth substantially as shown on the Drawings. Minor adjustments to this may be required in the field and no unit of measurement or payment shall apply for such variation.

In certain locations where the watermain is in direct conflict with storm or sanitary sewer, the watermain shall be constructed under the sewer. Where it is necessary to use vertical bends to avoid sewer mains, no extra compensation will be made for this construction. However, fittings will be a unit of measurement and payment.

When watermain and water services, whether lowered or existing, are in danger of freezing due to the proximity of sanitary sewers, or sanitary sewer structures, the Engineer may direct the placement of insulation between the sanitary sewer and the watermain or service pipe.

303.5 CONNECT WATER SERVICE

Unless otherwise specified, installation of water service lines shall provide for not less than eight (8) feet of cover over the top of the pipe and for not less than eighteen (18) inches of clearance between pipelines. A minimum of eighteen (18) inches of clearance shall be maintained in crossing over or under other structures. In the case of conflict with storm sewer, the water service shall be constructed below the storm sewer to permit a clearance of 1.5 feet between storm sewer invert and water service. Insulation will be required between storm sewer and water service to prevent freezing. The connection will be a wet tap unless authorized by the Engineer or specifically shown on the Drawings.

303.6 WATER SERVICE PIPES LESS THAN 3 INCHES IN DIAMETER

Copper service lines shall be installed continuous without joints between the corporation and curb stop with about one foot of slack at the corporation stop to allow for settlement and service line movement.

Expansion loops shall be directed upward from the tap. One and one-half (1 1/2) inch and two (2) inch service pipe shall have a 45 degree bend connected to the corporation stop to facilitate the downward expansion loop.

303.7 WATER SERVICE PIPES 3 INCHES IN DIAMETER OR LARGER

Water service pipes three (3) inches in diameter or larger shall meet the requirements specified in Watermain Pipe and Fittings Section and shall terminate at the property line with a valve.

303.8 WET TAPPING A WATERMAIN

When tapping a lateral watermain or service to an existing watermain, the Contractor shall be required to make connection to the existing watermain while the existing watermain is under pressure (i.e. wet tap) using an AWWA approved drilling machine, stainless steel tapping sleeve and tapping valve. Conductivity must be maintained from the main that was tapped to the new main by whatever methods necessary. A connection to an existing watermain by methods other than a wet tap can be done only with approval of the Engineer or if specifically shown on the Drawings. The Contractor shall verify the size of the existing watermain prior to ordering the fittings for the connection.

303.9 ADJUST GATE VALVE

The item "Adjust Gate Valve" shall include excavation around the structure as indicated on the plans, removal and replacement of the top valve box section, cap and adjustment to finished grade.

The Contractor shall make efforts to prevent debris and foreign matter from entering the valve box. Any debris entering the valve box shall be removed at the Contractor's expense. The Contractor shall assure that the gate valve can be operated upon completion of adjustment.

Pavement patching of the excavated area shall be the same material type and depth as shown in the plans and specifications. The backfill of the excavated area shall use aggregate base material

consistent with the requirements of the plans and specifications. The excavation area shall be sufficient to allow for compaction methods that achieve densities as outlined in Section 700 Bituminous Paving and Street Construction.

303.10 TEMPORARY WATER SERVICE

The Contractor shall furnish and install temporary water service to each home or business affected by the replacement of the existing water mains shown on the plans.

When the temporary watermain crosses a driveway slated for reconstruction, the temporary water main shall be below grade.

Prior to installation of any temporary water service, the Contractor shall submit to the Engineer for their review and approval, a plan showing details of connections, operations and other details that will meet this specification. The Contractor shall work directly with the City utility personnel to coordinate all details necessary to install and maintain the temporary water connections within the effected service area.

Typically, the main temporary distribution line should be a minimum of two (2) inches diameter and the connection to each house a minimum of one (1) inch diameter and can be made at the house hose bib. An alternative connection point or an interior temporary plumbing revision may be necessary if the hose bib is plumbed downstream of an individual softening system. In some instances, the hose bib may be fitted with a vacuum breaker/backflow preventer. In this case, an alternative connection point or temporary plumbing revision may be necessary. The cost of rectifying these situations is the sole responsibility of the contractor at no additional payment to the bid unit price.

The pipe and fittings may be polyethylene in accordance with AWWA C901-78, or polybutylene in accordance with C902-78, or other pipe materials allowed by the local building code, or otherwise approved by the Engineer. Piping such as garden hoses is not approved. Pipe joints shall be welded, fused or joined in other methods approved by the local building code. Pipe shall be protected from interruption of service. Installation shall include protection provisions for vehicular traffic in driveways, lawn mowing or other related circumstances.

Each service connection must also include a vacuum breaker, back-flow preventer and screen installed at the house connection, unless other means are proposed by the Contractor. Any other provisions of the local building code must also be adhered to. Minimum pressure at the house connection for any temporary service is to match existing pressure within five (5) pounds per square inch. If needed, a pressure reducing valve shall be installed at each house connection. The temporary water service pipes must be disinfected in accordance with the water main specification prior to connection to the houses. Temporary water service shall be maintained by the Contractor for the time they are required, and promptly removed when the new water main is approved for operation.

303.11 TRACER WIRE INSTALLATION

303.11.1 GROUNDING

Tracer wire must be properly grounded at all dead ends/stubs

Grounding of trace wire will be achieved by use of a drive-in magnesium grounding anode rod with a minimum of 20 ft of #14 red HDPE insulated copper clad steel wire connected to anode (minimum 0.5 lb.) specifically manufactured for this purpose, and buried at the same elevation as the utility.

When grounding the trace wire at dead ends/stubs, the grounding anode must be installed in a direction 180 degrees opposite of the trace wire, at the maximum possible distance.

When grounding the trace wire in areas where the trace wire is continuous and neither the mainline trace wire or the grounding anode wire will be terminated at/above grade, install grounding anode directly beneath and in-line with the trace wire. Do not coil excess wire from grounding anode. In this installation method, the grounding anode wire must be trimmed to an appropriate length before connecting to trace wire with a mainline to lateral lug connector.

Where the anode wire will be connected to a trace wire access box, a minimum of two (2) feet of excess/slack wire is required after meeting final elevation.

303.11.2 INSTALLATION

a. General

Trace wire installation will be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency (512Hz) signal for distances in excess of 1,000 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.

Trace wire systems must be installed as a single continuous wire, except where using approved connectors. No looping or coiling of wire is allowed.

Any damage occurring during installation of the trace wire must be immediately repaired by removing the damaged wire, and installing a new section of wire with approved connectors. Taping and/or spray coating will not be allowed.

Trace wire must be installed at the bottom half of the pipe and secured (taped/tied) at five (5) foot intervals.

Trace wire must be properly grounded as specified.

Trace wire on all service laterals/stubs must terminate at an approved trace wire access box located directly above the utility, at the edge of the road right-of-way, but out of the roadway. (See Trace wire Termination/Access)

At all mainline dead-ends, trace wire must go to ground using an approved connection to a drive-in magnesium grounding anode rod, buried at the same depth as the trace wire. (See Grounding)

Mainline trace wire must not be connected to existing conductive pipes. Treat as a mainline dead-end, ground using an approved waterproof connection to a grounding anode buried at the same depth as the trace wire.

All service lateral trace wires must be a single wire, connected to the mainline trace wire using a mainline to lateral lug connector, installed without cutting/splicing the mainline trace wire.

In occurrences where an existing trace wire is encountered on an existing utility that is being extended or tied into, the new trace wire and existing trace wire must be connected using approved splice connectors, and must be properly grounded at the splice location as specified.

b. Water System

A mainline trace wire must be installed, with all service lateral trace wires properly connected to the mainline trace wire, to ensure full tracing/locating capabilities from a single connection point.

Lay mainline trace wire continuously, by-passing around the outside of valves and fittings on the North or East side.

Trace wire on all water service laterals must terminate at an approved trace wire access box color coded blue and located directly above the service lateral at the edge of road right of way.

Above-ground tracer wire access boxes will be installed on all fire hydrants.

All conductive and non-conductive service lines must include tracer wire.

303.12 TESTING AND DISINFECTION

The Contractor shall perform all testing and disinfecting in the Engineer's presence.

Before being placed in service, the completed water main shall be disinfected. Two passing tests are required for temporary and permanent water main a minimum of 24 hours apart. Disinfection materials and procedures, and the collection and testing of water samples, shall be in accordance with the provisions of AWWA C-651. After the final flushing of watermain, the water shall be tested for bacteriologic quality and found to meet the standards prescribed by the Minnesota Department of Health.

303.12.1 ELECTRICAL CONDUCTIVITY TEST

The Contractor shall perform a conductivity test within one week of completion of pressure testing of the main on all iron pipe water mains to establish that electrical thawing may be carried out in the future.

The system (pipeline, valves, fittings and hydrants) shall be tested for electrical continuity and current capacity. The electrical test shall be made after the hydrostatic pressure test and while the line is at normal operating pressure. Backfilling shall have been completed.

Direct current of 350 amperes +/- 10% shall be passed through the pipeline for five minutes. Current flow through the pipe shall be measured continuously on a suitable ammeter and shall remain steady without interruption or excessive fluctuation throughout the five-minute test period.

Insufficient current or intermittent current or arcing, indicated by large fluctuation of the ammeter needle, shall be evidence of defective contact in the pipeline. The cause shall be isolated and corrected. Thereafter, the section in which the defective test occurred shall be retested as a unit and shall meet the requirements.

303.12.2 TRACER WIRE TESTING

A conductivity test shall be completed on the tracer wire system installed with PVC or HDPE pipe water mains. All new tracer wire installations must be located using typical low frequency (512 Hz) line tracing equipment, witnessed by the contractor, engineer and facility owner as applicable, prior to acceptance of ownership. This verification must be performed upon completion of rough grading and again prior to final acceptance of the project. Continuity testing in lieu of actual line tracing will not be accepted.

304.0 METHOD OF MEASUREMENT

All items will be measured separately according to design designation as indicated in the pay item name and as may be detailed and defined in the Drawings, Specifications, or Special Conditions.

304.1 REMOVALS

304.1.1 REMOVE WATERMAIN PIPE

Measurement shall be by the linear foot and shall include the removal of all fittings and gate valves located along the alignment of the pipe designated for removal.

304.1.2 SALVAGE HYDRANT

Measurement shall be by the unit.

304.2 WATERMAIN AND SERVICE PIPE

Mainline pipe and service pipe of each kind and size will be measured separately by the overall length along the axis of the pipeline, from beginning to end of each installation and without regard to intervening valves or specials. Terminal points of measure will be the spigot or cut end, base of hub or bell end, center of valves or hydrants, intersecting centers of tee or wye branch service connections, and center of corporation stop or curb stop couplings.

Tracer wire and connection of water services shall be incidental to the construction of the watermain.

304.3 WETTAPPING A WATERMAIN

The installation of the tapping sleeve and valve under pressure shall be measured as a unit, and shall include all labor, tapping sleeve, valve, valve box, and miscellaneous materials and equipment necessary to make the installation.

304.4 DUCTILE IRON FITTINGS

Ductile iron fittings shall be measured per pound installed. The weight of the fittings shall be "without joint accessories" and shall be the standard weight of fittings per AWWA C153/A21.53, Ductile Iron Compact Fittings. Joint accessories are considered incidental to fittings.

304.5 VALVES, BOXES AND VALVE MANHOLES

304.5.1 GATE VALVES AND BOXES

Valves of each size and type will be measured separately as complete units. This shall include valves, valve boxes, and valve box stabilizers.

304.5.2 AIR RELIEF VALVE AND MANHOLE:

Air relief valve and manhole shall be measured as a unit including complete manhole, granular fill, corporation stop, gate valve and accessories.

304.5.3 CURB STOP AND BOX:

Curb stop and box of each size and type, including box extensions, and constructing Ford A-1 Meter Box Covers on all curb stop and box units located within pavement surfaces (i.e. concrete, bituminous, pavers, etc.) will be considered as a unit.

304.5.4 CORPORATION STOP:

Corporation stops of each size and type will be measured per unit. Stainless steel saddle shall be incidental.

304.5.5 ADJUST GATE VALVE:

Measurement for adjusting existing gate valves shall be by the unit, and shall include salvaging and resetting the valve box. Additional steel fitted rings deemed necessary to match

wear course pavement shall be incidental. Adjustment of new gate valves shall be incidental to the installation of the new gate valve.

304.6 HYDRANTS

Hydrants will be measured by the number of units installed. Hydrant extensions shall be measured in six (6) inch increments.

304.7 TEMPORARY WATER SERVICE

Temporary water service shall be measured on a lump sum basis and shall include all materials and labor necessary for complete placement, operation and removal of all temporary water services required by this project.

305.0 BASIS OF PAYMENT

Payment for construction of water distribution facilities will be made as detailed in the method of measurement and as shown in the Contract Documents or detailed in the Special Conditions.

Payment shall include all costs of furnishing and installing the complete facility as required by the Drawings, Specifications, and Special Conditions.