

# **DIVISION 500**

# **RECLAIMED WATER SYSTEM CONSTRUCTION**

**DIVISION 500**

**SECTION 501**

**RECLAIMED WATER  
MAIN  
CONSTRUCTION**

## SECTION 501

### **RECLAIMED WATER MAIN CONSTRUCTION**

#### **501.1 SCOPE**

The work under this section includes the furnishing, installing, laying, jointing, and testing of all reclaimed water lines, hydrants, fittings, valves and appurtenances, including necessary service connections required for a complete system as shown on the drawings and specified herein. The work shall also include such connections, reconnections, relocations, temporary services, abandonments, and all other provisions in regard to existing reclaimed water service operations and modifications required to perform the new work.

#### **501.2 GENERAL REQUIREMENTS**

- 501.2.1** All work shall be proven to be in first class condition and constructed properly in accordance with the drawings and specifications. All defects and leaks disclosed by the tests shall be remedied and re-tested.
- 501.2.2** All tests and re-tests shall be performed in the presence of the **CITY ENGINEER, UTILITY DIRECTOR**, or a designated representatives. The **CONTRACTOR** shall be responsible for Hydrostatic Pressure Tests and chlorination of the water mains. The **CONTRACTOR** shall be responsible for compaction and density testing and fire hydrant flow testing. Re-testing and any other additional testing required by this section shall be at the **CONTRACTOR'S** expense.
- 501.2.3** Compaction and density testing are specified in Standard Details 478-5.2A and B, of City of Valdosta, Volume I Standard Specifications for Water and Sewer Construction.
- 501.2.4** "Asbuilt" drawings of reclaimed water mains, fire hydrants, valves and services shall be prepared in accordance with Section 506, City of Valdosta, Volume I, Standard Specifications for Water and Sewer Construction.
- 501.2.5** Dewatering, clearing and grubbing, cleanup and other related site work for reclaimed water main construction are specified in GDOT Standard Specifications Construction of Transportation Systems.
- 501.2.6** Unless otherwise specified, reclaimed water mains shall be installed according to AWWA C-600-latest.
- 501.2.7** All installed reclaimed water mains constructed of PVC shall be installed with copper locating wire(s) as shown on Standard Detail 478-7.1A, City of Valdosta, Volume I Standard Specifications for Water and Sewer Construction.
- 501.2.8** Boring and Jacking operations shall be in accordance with Section 474, City of Valdosta, Volume I, Standard Specifications for Water and Sewer Construction.
- 501.2.9** Reclaimed water mains are to be installed with minimum of 48" cover unless otherwise directed by the **CITY ENGINEER** or as called for on the plans.

### 501.3 MATERIALS

- 501.3.1 All materials required under this section which are necessary for the construction of reclaimed water mains shall be of the type, model and manufacturer specified under the applicable specifications of Section 509, of this manual.
- 501.3.2 Materials not specified herein, or under Section 509 (cited above), shall not be installed in the reclaimed water main system.
- 501.3.3 Requests for materials to be approved by the **CITY** shall be made to the **CITY ENGINEER**, in writing, in accordance with set procedures. Copies of the procedure policy may be obtained from the **UTILITY DIRECTOR**.
- 501.3.4 All materials shall be free from defects impairing strength and durability, and be of the best commercial quality for the purpose specified. It shall have structural properties sufficient to safely sustain or withstand strains and stress to which it is normally subjected and be true to detail.
- 501.3.5 All pipe, valves, fire hydrants and fittings shall be clearly marked with the name or trademark of the manufacturer, the batch number, the location of the plant, strength designation and pressure rating.
- 501.3.6 The **CONTRACTOR** shall submit to the **UTILITY DIRECTOR** for approval before work begins, certificates of inspection in triplicate from the pipe manufacturer that the pipe and fittings supplied have been inspected at the plant and meet the requirements of these specifications.
- 501.3.7 Refer to Section 509 of this manual for materials requiring shop drawing submittals.

### 501.4 CONSTRUCTION

- 501.4.1 Excavation, trenching and backfilling shall conform to the GDOT Utility Accommodation Policy and Standards manual
- 501.4.2 Pipe Installation
- 501.4.2.1 General - The method of pipe laying shall be subject to the approval of the **CITY ENGINEER**. Each pipe length shall be inspected for cracks. Care shall be exercised to keep the pipe in close alignment and at the specified depths as called for on the plans. If approved by the **CITY ENGINEER** and **UTILITY DIRECTOR**, minor changes in alignment and/or depth may be permitted to avoid underground facilities. Upon discovery, any defective pipe which may have been laid shall be removed and replaced with sound pipe, at no additional cost to the **CITY**. It shall be the **CONTRACTOR'S** responsibility to locate all underground utilities in advance of construction to insure that no conflicts occur with the proposed alignment and depth. The **CONTRACTOR** is to furnish the **CITY ENGINEER** and **UTILITY DIRECTOR** all pertinent information so that remedial design can be performed.

**501.4.2.2**      Laying and Jointing - The pipe shall be laid on an unyielding foundation with uniform bearing under the full length of the barrel of the pipe. Suitable excavations shall be made to receive the bell of each pipe. The spigot end of the pipe shall abut the base of the socket of the adjacent pipe in such a manner that there will be no gaps along the perimeter of the mating halves. Just before jointing the pipe, the mating ends shall be thoroughly cleaned of all dirt, debris, and foreign material. The pipe shall be jointed in accordance with the recommendations of the manufacturer of the pipe and gasket. In all jointing operations, the trench must be de-watered when joints are made, and kept de-watered until sufficient time has elapsed to assure sufficient hardening of the jointing material, or as may be required. The pipe shall not be driven down to grade by striking it with a shovel handle, timber, rammer, or other unyielding object. The **CONTRACTOR** shall take all necessary precautions to prevent flotation of the pipe from flooding of the trench.

**501.4.2.3**      Locations

**501.4.2.3.1**      Reclaimed water lines to be constructed in easements shall be centered within the boundaries of the easement. If trees or other structures should interfere with the alignment of the reclaimed water main, the reclaimed water main shall be adjusted towards the right of way line.

**501.4.2.3.2**      Minimum depths shall be 48” in all road rights of way and easements. Minimum depths for reclaimed water mains shall be 36” in residential and conflict areas. The depth of cover shall be measured from the top of the reclaimed water main to the finished grade or centerline of roadway directly above the pipe.

**501.4.2.3.3**      Minimum horizontal clearance between parallel reclaimed water mains and gravity sanitary sewer mains shall be six foot (6’), (10’ preferred.) Where this separation is not met, one of the following must occur:

1.      The reclaimed water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the reclaimed water main is at least six inches (6”) above the top of the sewer, or
2.      If both sanitary sewer and reclaimed water mains are proposed and the above condition cannot be met, then the sanitary sewer pipes shall be upgraded to ductile iron pipe (DIP) and pressure tested.
3.      If the sanitary sewer is existing and the reclaimed water main is proposed, the reclaimed water main shall, at a minimum, be upgraded to DIP, constructed in separate trenches, laid at a higher elevation than the sanitary sewer, and utilize staggered joints.

**501.4.2.3.4**      Minimum horizontal clearance between parallel reclaimed water mains and storm sewer mains shall be three foot (3’). Where this separation is not met, the reclaimed water main shall be upgraded to ductile iron pipe the entire

length where the separation of three feet (3') cannot be met, pressure tested, and joints staggered.

**501.4.2.3.5** Minimum horizontal clearance between parallel reclaimed water mains and sanitary sewer force mains shall be six feet (6') (10' preferred.) Where this separation is not met, the force main shall be upgraded to ductile iron pipe the entire length where the separation of six feet (6') cannot be met, pressure tested, and joints staggered.

**501.4.2.3.6** Minimum horizontal clearance between parallel reclaimed water mains and reuse force mains shall be three feet (3'). Where this separation is not met, the force main shall be upgraded to ductile iron pipe the entire length where the separation of three feet (3') cannot be met, pressure tested, and joints staggered.

**501.4.2.3.7** Minimum vertical clearance between reclaimed water mains and gravity sanitary sewer mains crossing each other shall be six inches (6") (12" preferred.) Where this separation is not met, the sanitary sewer main shall be upgraded to 20' of ductile iron pipe, centered on the point of crossing, and pressure tested.

**501.4.2.3.8** Minimum vertical clearance between reclaimed water mains and storm sewer mains crossing each other shall be six inches (6"), twelve inch (12") preferred. Where this separation is not met, the reclaimed water main shall be upgraded to 20' of ductile iron pipe, centered on the point of crossing, and pressure tested.

**501.4.2.3.9** Minimum vertical clearance between reclaimed water mains and sanitary sewer force mains crossing each other shall be 12". Where this separation is not met, the force main shall be upgraded to 20' of ductile iron pipe, centered on the point of crossing, and pressure tested.

**501.4.2.3.10** Minimum vertical clearance between water mains and reclaimed mains crossing each other shall be 12". Where this separation is not met, the force main shall be upgraded to 20' of ductile iron pipe, centered on the point of crossing, and pressure tested.

**501.4.2.4** Assembly of Joints - Assemble all joints in accordance with recommendations of the manufacturer. If a lubricant is required to facilitate assembly, it shall have no detrimental effect on the gasket or on the pipe when subjected to prolonged exposure. Proper jointing may be verified by rotation of the spigot by hand or with a strap wrench. If unusual jointing resistance is encountered, or if the insertion mark does not reach the flush position, disassemble the joint, inspect for damage, re-clean the joint components, and repeat the assembly steps. Note that fitting bells may permit less insertion depth than pipe bells. (**NOTE:** When mechanical equipment is used to assemble joints, care should be taken to prevent over-insertion).

**501.4.2.5**      Cleaning - All necessary precautions shall be taken to prevent the entrance of mud, sand or other obstructing material into the pipeline. As the work progresses, the interior of the water main shall be cleaned of all dirt, jointing material, and superfluous materials of every description. Prior to final inspection, the **CONTRACTOR** shall flush all water lines constructed under this contract with clean water to assure complete removal of all debris and foreign materials.

**501.4.2.6**      Bedding and Backfill - Immediately after the pipe has been jointed and inspected, sufficient backfill shall be performed to protect the pipe adequately from injury and movement. Where so indicated on the drawings, or where directed by the **CITY ENGINEER**, the pipe shall be supported by compacted granular fill or concrete cradle or encasement according to the applicable detail shown on the plans. Pipe bedded in compacted granular backfill shall not be supported on blocking, wedges, bricks, or anything except the bedding material. Where concrete cradle or encasement is required, the pipe shall be supported on solid concrete blocks or pre-cast concrete saddles which shall become part of the completed cradle or encasement. Where no other bedding is indicated, pipe shall be placed on a shaped bed of undisturbed material.

**501.4.2.7**      Early Warning Tape – The **CONTRACTOR** shall install warning tape 12” to 18” on top of PVC pipe or on top of DIP pipe.

**501.4.3**      Maintenance of Service

Maintenance of service is of the utmost importance and no service shall be discontinued without the consent of the **CITY ENGINEER** and the **UTILITY DIRECTOR** for each particular interruption of said service. In no case will any service be discontinued without at least twenty-four (24) hours notice given to the **CITY ENGINEER** and the **UTILITY DIRECTOR** by the **CONTRACTOR**. To achieve minimum inconvenience to the public and users of the water system, some work on the project may have to be done during "OFF" hours. The **CONTRACTOR** shall take this requirement into consideration when preparing his bid as no additional compensation will be allowed therefore.

**501.4.4**      Installing Valves

**501.4.4.1**      Reclaimed water valves two inches (2”) through 10” shall be gate valves. Valves 12” and larger shall be butterfly valves. Valves deeper than five feet (5’) will require valve nut extensions, must be welded and one-piece.

**501.4.4.2**      All valves shall be fitted with a cast iron valve box and cover. Valve boxes shall be long enough to reach from the valve to finished ground level and shall be installed as recommended by the manufacturer. They shall have suitable barrel and shaft extension sections to cover and protect the valve bonnet section. Extension sections fabricated by one piece of ductile iron shall be allowed. No more than one (1) shaft extension shall be used in any one (1) valve installation. Valve box extensions shall be by same manufacturer as valve box or ductile iron pipe.

**501.4.4.3**      Valve boxes shall be installed in vertical alignment and positioned to facilitate the operation of the valve with a standard valve wrench. The box shall be installed as

shown on the drawings and shall be set on firmly packed soil and bricks so as to prevent settlement and to prevent bearing on the valve or the main at any point.

**501.4.4.4** Installation of valve boxes shall be in accordance with these Specifications and Standard Details 478-4.1A and 478-4.1B. All valve boxes in pavement shall be lockable non-pop type covers.

#### **501.4.5**     Adjusting Valve Boxes

**501.4.5.1**     All valve boxes which lie within the area of finished construction shall be adjusted to finish grade in accordance with these Specifications and Standard Details 478-4.1A and 478-4.1B. All valve boxes in pavement shall be lockable non-pop type covers.

**501.4.5.2**     Valve boxes shall be protected during construction in accordance with these specifications. Any valve boxes damaged during construction shall be replaced at the **CONTRACTOR'S** expense. Removal and replacement of the valve box during construction may be authorized provided the **CONTRACTOR** insures that sufficient valve ties are available and on site in order to quickly locate the valve.

**501.4.5.3**     Adjustment of valve boxes shall be subject to the approval of the **CITY ENGINEER** and **UTILITY DIRECTOR**. The **CONTRACTOR** shall maintain vertical alignment and position so as to permit operation of the valve with a standard valve wrench. No more than one (1) extension piece shall be allowed in any installation. Valve box extensions shall be by same manufacturer as valve box or made from six inches (6") cast iron or ductile iron.

#### **501.4.6**     Fire Hydrant Installation

**501.4.6.1**     Where hydrants are to be located at intersections, the hydrant shall be located 25' back from the intersection of right of way lines. Where major highways are involved, the fire hydrants shall be placed on the connecting street.

**501.4.6.2**     A minimum distance of three feet (3') shall be maintained from any obstruction such as fences, buildings, trees, etc. In no case shall the distance from the right of way line to the fire hydrant be less than three feet (3'), unless an easement is provided to ensure setback requirements.

**501.4.6.3**     Hydrants shall be set so that a minimum of three feet (3') of clearance is provided between the hydrant operating nut and any obstacles that may hinder opening and closing of the hydrant.

**501.4.6.4**     Cover over the connecting pipe from the main to the hydrant shall be 36" minimum unless specified otherwise on the plans.

**501.4.6.5**     Fire hydrants shall be blocked by concrete or mega-lug restraints on the back side of the hydrant to prevent movement due to water pressure thrust. Gravel or rip rap shall be placed around the base of the hydrant to insure complete drainage of the hydrant when closed. See Standard Detail 508-1.1.

**501.4.6.6** Until fire hydrants have been accepted by the **CITY ENGINEER** and **UTILITY DIRECTOR** and are ready for use, the **CONTRACTOR** shall place a hydrant status sign on the steamer connection. Donut will remain on the hydrant until an acceptable flow has been performed.

**501.4.6.7** The **CONTRACTOR** is warned that the **CITY** will flow test all fire hydrants prior to the work being considered for acceptance. Unless required by the **CITY ENGINEER** to prevent erosion prior to the time of flow testing, seeding and mulching (or sodding, if required) and final grading around a hydrant should be completed after successful flow testing of that hydrant. The **CITY** shall not be responsible for reworking, reshaping, seeding, mulching, sodding or other related work disrupted during hydrant testing and prior to acceptance of the hydrant by the **CITY**.

**501.4.6.8** Fire hydrants shall be installed in accordance with these Specifications and Standard Detail 508-1.1. The **CONTRACTOR** shall be responsible for hydrant adjustment to grade.

**501.4.6.9** Where adjustment of hydrants becomes necessary the hydrant shall be adjusted by use of a hydrant extension. Only one (1) extension shall be allowed to adjust the hydrant to final grade. Hydrant extension shall be by the same manufacturer as the hydrant. Maximum length of extension is two feet (2').

#### **501.4.7** Service Connections

**501.4.7.1** All new service connections shall be constructed in accordance with these Specifications and Standard Detail 508-2.

**501.4.7.2** Reclaimed water services shall be installed at property corners and may be either single or double type services.

**501.4.7.3** All reclaimed water services shall be installed with a copper locating wire(s) in accordance with Standard Detail 478.7.1A. Locating wire(s) shall be installed to a three o'clock, nine o'clock position, or directly above the service pipe. Plastic tie straps shall be used to secure the wire(s).

**501.4.7.4** Reclaimed water meters shall be located at the right of way line and on the property owner's side of the right of way line.

**501.4.7.5** Existing reclaimed water services that are to be relocated to new water mains shall be relocated as indicated on the plans. The **CONTRACTOR** shall install all new service pipe and fittings including the back side of the meter box.

**501.4.7.6** Reclaimed water services under roads shall be installed in a casing. For three-quarter inch (3/4") and one inch (1") piping, install in two inch (2") PVC, HDPE, or steel casing. For two inch (2") piping install in four inch (4") PVC, HDPE, or steel casing.

#### **501.4.8**     Temporary Plugs

At all times when pipe laying is not actually in progress, the open ends of the pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

#### **501.4.9**     Handling and Cutting Pipe

**501.4.9.1**     The **CONTRACTOR'S** attention is directed to the fact that cast iron used for pipe and fittings is comparatively brittle. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe, scratching or marring machined surfaces, and abrasion of the pipe coating.

**501.4.9.2**     Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.

**501.4.9.3**     In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portion, if so approved, may be cut off by and at the expense of the **CONTRACTOR** before the pipe is laid so that the pipe used may be perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches (12") from the visible limits of the crack.

**501.4.9.4**     Except as otherwise approved, all cuttings shall be done with a machine having rolling wheel cutters, or pipe saw adapted for that purpose. All cut ends shall be examined for possible cracks caused by cutting.

#### **501.4.10**    Sleeve-Type Couplings

**501.4.10.1**    Couplings shall be furnished with the pipe stop removed. Couplings shall be provided with plain, Grade 27, rubber gaskets and with black, steel, track-head bolts with nuts.

**501.4.10.2**    To ensure correct fitting of pipe and couplings, all sleeve-type couplings and accessories shall be furnished by the supplier of the pipe.

#### **501.4.11**    Setting Appurtenances

**501.4.11.1**    All valves, fittings and appurtenances installed upon the pipelines shall be set and jointed by the **CONTRACTOR** as indicated on the drawings or as required.

**501.4.11.2**    Valves shall be set vertically so that stems form a vertical line. Care shall be taken to keep out dirt and sand, and no valves shall be operated until it has been cleaned of sand, grit, or other foreign material.

#### **501.4.12**    Piping Support and Thrust Blocking

**501.4.12.1** The **CONTRACTOR** shall furnish and install all supports necessary to hold the piping and appurtenances in a firm, substantial manner at the lines and grades indicated on the drawings or specified.

**501.4.12.2** All bends, tees, and other fittings in pipelines and sleeve-coupled pipelines buried in the ground shall be backed with Class 1 concrete placed against undisturbed earth where firm support can be obtained or by the use of restrained joints. If the soil does not provide firm support, then suitable tie rods, clamps, and accessories or restrained joints shall be provided to brace the fitting properly. Such tie-rods, etc., shall be coated thoroughly and heavily with an approved bituminous paint after assembly or, if necessary, before assembly.

**501.4.12.3** Where buried piping contains fittings which raise or lower the centerline of the pipe, suitable socket clamps, tie rods, or other approved restraining devices shall be used to prevent movement of the fittings. The restraining devices shall be coated thoroughly and heavily with an approved bituminous paint.

**501.4.13** Nonstandard Fittings and Wall Castings

Fittings having non-standard dimensions and cast especially for this project shall be of approved design. They shall be manufactured to meet the requirements of the same specifications and shall have the same diameter and thickness as standard fittings, but their laying lengths and types of ends shall be determined by their positions in the pipelines and by the particular piping to which they connect.

**501.4.14** Tapped Connections to Cast Iron Pipe

**501-4.14.1** Tapped connections in the barrel of cast iron pipe or fittings without bosses shall not exceed the following sizes:

<u>Normal Size of Pipe</u>	<u>Maximum Nominal Size of Pipe</u>
3"	1/2"
4"	3/4"
6"	1"
8"	1 1/4"
10"	1 1/2"
12"	2"

**501.4.14.2** Where the size of the connection exceeds that given above for the pipe in question, a boss shall be provided on the pipe barrel, the tap shall be made in the flat part of the intersection of the run and branch of a tee or cross, or the connection shall be made by means of a tapped tee, branch fitting and tapped plug or reducing flange, or tapping tee and tapping valve, all as indicated or approved.

**501.4.14.3** All drilling and tapping of cast iron pipe shall be done normal to the longitudinal axis of the pipe; fittings shall be drilled and tapped similarly, as appropriate.

Drilling and tapping shall be done only by skilled mechanics. Tools shall be adapted to the work and in good condition so as to produce good, clean-cut threads of the correct size, pitch, and taper. Bits must be chlorinated prior to beginning of drilling.

Existing valves will be locked in lieu of providing a gap in the piping and will not be unlocked until clearance is obtained.

#### **501.4.15** Connections to Existing Reclaimed Water Lines

**501.4.15.1** Connections to existing reclaimed water lines shall be where shown on the plans and shall be done as detailed on the plans or as directed by the **CITY ENGINEER** or **UTILITY DIRECTOR**. Connection cannot occur until clearance has been obtained by the **CITY ENGINEER**. Connection of new to existing reclaimed mains shall be performed in the normal accepted method for connecting mains and shall be done without unduly disrupting service. All connections regardless of how done are subject to the approval of the **CITY ENGINEER** and **UTILITY DIRECTOR** as to method, time, and location. To ensure adequate backflow prevention and accountability of water use, the **CONTRACTOR** shall install a temporary jumper connection as specified in Standard Details 508-5.1A and 508-5.1B.

**501.4.15.2** Where proposed lines are connected to existing lines, the **CONTRACTOR** shall take appropriate action to insure that the existing lines do not interfere with the disinfection or pressure testing portions of the work. Failure to do so will not relieve the **CONTRACTOR** of the responsibility of properly disinfecting and pressure-testing the entire system installed. The **CONTRACTOR** shall bear full responsibility for his action or inaction in this matter and shall not claim damages, injuries or additional compensation for his action or inaction.

**501.4.15.3** Where new reclaimed water services are to replace existing water services, the entire existing water service shall be removed to the main except for the valve or corporation stop controlling the service. This shall include the pipe and gooseneck assembly. Refer to Section 501.4.7.3 of these specifications for additional requirements.

**501.4.15.4** At least forty-eight (48) hours prior to excavating for the actual connection operation, the **CONTRACTOR** shall excavate and expose the main to be cut out at the proposed location and shall so advise the Project Inspector so that the Project Inspector may inspect the exposed area and verify, if appropriate, to the **PROJECT ENGINEER** that no conditions are present that would hamper the connection operation. The method of connecting shall be subject to the approval of the **UTILITY DIRECTOR**.

**501.4.15.5** Water from existing lines cut either by accident or during connection to proposed lines shall not be disposed of in a manner that would be injurious to residents, property or structures.

#### **501.4.16** Open Cut Pavement Crossings

**501.4.16.1** Bases, Sidewalk, Curb and Driveway Repairs – The **CONTRACTOR** shall replace any and all bases, sidewalks, curbs and gutter, and driveways with materials and workmanship sufficient to give an equal and similar surface to the disturbed areas as existed before construction with minimum standards as established elsewhere in the Specifications.

**501.4.16.2** Pavement removal and replacement shall be in accordance with GDOT Standard Specifications Construction of Transportation Systems, and Standard Details 478-6-1A and 478-6.1B of this manual.

#### **501.4.17** Cleaning and Flushing

**501.4.17.1** Prior to the pressure and leakage tests, all piping shall be thoroughly cleaned of all dirt, dust, oil, grease and other foreign matter. This work shall be done with care to avoid damage to any inside coating.

**501.4.17.2** All lines shall be thoroughly flushed with clean water to clear the lines of all foreign matter.

### **501.5** INSPECTION AND TESTING

#### **501.5.1** General

All pipe, fittings, valves, and other items shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

#### **501.5.2** Field Testing

**501.5.2.1** In this section, the terms "piping" and "pipelines" shall include the pipe, fittings, joints, valves, hydrants and all other appurtenances necessary for the complete work.

**501.5.2.2** Except as otherwise directed, all pipelines shall be tested. Pipelines laid in excavation or bedded in concrete shall be tested prior to the backfilling of the excavation or placing of the concrete, and exposed piping shall be tested prior to field painting.

**501.5.2.3** All piping to operate under liquid pressure shall be tested in sections of approved length. For these tests the **CONTRACTOR** shall furnish clean water, suitable temporary testing plugs or caps, and other necessary equipment and all labor required, without additional compensation. The **CONTRACTOR** shall furnish suitable pressure gauges, pumps and measuring tank.

**501.5.2.4** Water for testing and flushing shall be furnished by the **CITY** unless otherwise specified by the **CITY ENGINEER** and **UTILITY DIRECTOR**. The **CONTRACTOR** shall make suitable arrangements with the City Utilities Department for the monitoring of water consumption and locations to which water

may be made available. Water charges shall be in accordance with the Contract Documents.

**501.5.2.5** Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality and all air shall be expelled from the pipe. If hydrants, blowoffs, or other outlets are not available at high points for releasing air, the **CONTRACTOR** shall make the necessary taps at such points, and shall plug said holes after completion of the test.

**501.5.2.6** All piping shall be subjected to hydrostatic testing in accordance with Section 4 “Hydrostatic Testing” of AWWA C-600-latest. Pressure tests shall be at 150 psi, minimum, for a minimum of two (2) hours duration. No pipe installation will be accepted if the leakage is greater than that determined by the following formula or 5 psi:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

Where:

L = allowable leakage, in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of the pipe, in inches

P = average test pressure during the leakage test, in pounds per square inch (gauge)

**501.5.2.7** It is the intent of this section to insure that all parts of the work including but not being limited to pipe, fittings, joints, valves, hydrants, and any other appurtenances are subjected to testing as described herein. To achieve this, all methods of testing shall be approved by the **CITY ENGINEER** and **UTILITY DIRECTOR**.

## **501.6 ABANDONING RECLAIMED WATER MAINS**

**501.6.1** When reclaimed water mains are to be abandoned and called for on the plans to be left in place, the **CONTRACTOR** shall cut the water main as required to make connections or install plugs. That portion of the pipe to be abandoned and left in place shall be plugged at locations where the pipe was cut or punctured. Plugging shall be done by grouting the end or punctured area to the satisfaction of the **UTILITY DIRECTOR**.

**501.6.2** Reclaimed water mains to be abandoned and removed shall be cut or disconnected as required.

## **501.8 ASBUILTS**

After all work has been completed on the water main system, the entire project shall be asbuilt in accordance with Section 506 of this manual. This shall include asbuilts of construction plans and preparations of valve tie sheets.

# **DIVISION 500**

## **SECTION 505**

### **RECLAIMED WATER SYSTEM**

### **DESIGN, PROCEDURES AND POLICIES**

**SECTION 505**  
**RECLAIMED WATER SYSTEM DESIGN, PROCEDURES AND POLICIES**

**505.1 GENERAL**

**505.1.1** This section has been provided to give Developers and Engineers a guideline in the design of reclaimed water mains and related systems and appurtenances which will eventually become the ownership of the **CITY**. The guidelines set forth hereinafter are intended to be the policy of the **CITY** with regards to certain criteria the **CITY** feels is necessary in the expansion of its water distribution system. Certain items in Sections of Division 500 or as particularly specified in the City of Valdosta Ordinances, or policies shall govern over the guidelines specified herein.

**505.1.2** Reference to materials under this section are used in general. Refer to Section 509 of this manual for particular sizes, manufacturers, and model numbers.

**505.2 DESIGN OF RECLAIMED WATER SYSTEM**

**505.2.1 RECLAIMED WATER MAINS**

**505.2.1.1 Pipe Sizes**

**505.2.1.1.1** Reclaimed water main pipe diameters shall be 6", 8", 12", 16", 18", 20", 24", 30", or 36" only. Other size pipe diameters shall not be allowed except that where new water mains are to be connected to existing water mains which are of a lesser diameter (i.e., an 8" main on a 6" main) and the opposite end of the water main cannot be connected to an existing main that has a pipe diameter equal to or larger than the new main, then the pipe diameter of the new main may be the same diameter as the existing main but shall be subject to the approval of the **UTILITY DIRECTOR**.

**505.2.1.1.2** All reclaimed water mains shall be polyvinylchloride (PVC) or ductile iron pipe (DIP) based on pressure. If PVC and ductile iron pipe are the same price, DIP will be used. All PVC pipe shall be reclaimed water purple, have identifying tape and locating wires on top and bottom or if a single wire is used per specification 479-08-04-01 it should be installed above the pipe. PVC pipe shall meet requirements of ANSI/AWWA C-900, DR14 and DR18.

**505.2.1.1.3** Minimum size mains where fire hydrants or fire systems are to be installed shall be eight inches (8"). All hydrant connections off the water mains shall be six inches (6") and DIP.

**505.2.1.1.4** Sizing of reclaimed water mains shall be in accordance with the City's master distribution plans.

- 505.2.1.1.5** Fittings shall be DIP fittings for DIP and PVC installations. Mega-lugs can be used on DIP and PVC, if they are lower cost than concrete thrust blocks or if concrete thrust blocks can't be used. Mega-lugs on PVC have to be non-penetrating mega-lugs, specifically designed for PVC.
- 505.2.1.1.6** For PVC reclaimed water mains, DIP tees and valves will be installed at any potential future connection points where the future connection is 6" or larger in diameter.
- 505.2.1.1.7** Taps on PVC reclaimed water mains shall be full bodied tapping sleeves.
- 505.2.1.1.8** Locating wire(s) shall be installed on all PVC and HDPE reclaimed water mains.
- 505.2.1.1.9** Provide design calculations showing the pressures designed for the reclaimed water system. The working pressures within the system shall not exceed the pressure class of the pipe with a 1.5 safety factor. PVC C-900, DR-14 is rated at 305 psi, PVC C-900, DR-18 is rated at 235 psi.
- 505.2.1.1.10** CITY will maintain all reclaimed water mains to the point of metering.

#### **505.2.1.2** Locations

- 505.2.1.2.1** Water lines to be constructed in easements shall be centered within the boundaries of the easement. If trees or other structures should interfere with the alignment of the reclaimed water main, the reclaimed water main shall be adjusted towards the right-of-way line. Permanent easements shall be provided where the adjustment is required beyond the right-of-way limits. Minimum easement width shall be 20'.
- 505.2.1.2.2** Minimum depths shall be 48" in all road rights-of-way and easements. Minimum depths for reclaimed water mains shall be 36" in residential and conflict areas. The depth of cover shall be measured from the top of the water main to the finished grade or the centerline of the roadway directly above the pipe.
- 505.2.1.2.3** Minimum horizontal clearance between parallel reclaimed water mains and gravity sanitary sewer mains shall be six feet (6'), (10' preferred.) See Detail 478-1.4A.
- 505.2.1.2.4** Minimum horizontal clearance between parallel reclaimed water mains and storm sewer mains shall be three feet (3'). See Detail 478-1.4A.
- 505.2.1.2.5** Minimum horizontal clearance between parallel reclaimed water mains and sanitary sewer force mains shall be six feet (6') (10' preferred.) See Detail 478-1.4A.

- 505.2.1.2.6** Minimum horizontal clearance between parallel water mains and reclaimed water mains shall be three feet (3'). See Detail 478-1.4A.
- 505.2.1.2.7** Minimum vertical clearance between reclaimed water mains and gravity sanitary sewer mains crossing each other shall be six inches (6") (12" preferred.) See Detail 478-1.4A
- 505.2.1.2.8** Minimum vertical clearance between reclaimed water mains and storm sewer mains crossing each other shall be six inches (6") (12" preferred.) See Detail 478-1.4A.
- 505.2.1.2.9** Minimum vertical clearance between reclaimed water mains and sanitary sewer force mains crossing each other shall be 12". See Detail 478-1.4A.
- 505.2.1.2.10** Minimum vertical clearance between water mains and reclaimed water mains crossing each other shall be 12". See Detail 478-1.4A.
- 505.2.1.2.11** Reclaimed water lines, regardless of whether they are City or Developer owned or maintained, shall be constructed to City Standards up to the point of metering.
- 505.2.1.2.12** All reclaimed water lines located on private property shall be owned and maintained by the property owner, except where it is to the advantage of the **CITY** to own and maintain the reclaimed water line, in which case, such reclaimed water lines shall be within a legally described easement dedicated to the **CITY**. Minimum easement width shall be 20 feet.
- 505.2.1.2.13** Reclaimed water mains shall not be located within six feet (6') of the center of trees.

**505.2.1.3** Termination of Water Mains

- 505.2.1.3.1** Isolation valves shall be installed on reclaimed water mains which are plugged for future extension.
- 505.2.1.3.2** Where reclaimed water mains are plugged and no future extension is planned, a permanent blow-off assembly shall be installed for flushing of the reclaimed water main. Fire hydrants or permanent blow-off assemblies shall be provided for this purpose.
- 505.2.1.3.3** Where reclaimed water mains are stubbed out for future extension and the distance from the isolation valve to the plug is less than 40' a Construction Blow-off Assembly (Standard Detail 508-3.3C) shall be installed.
- 505.2.1.3.4** Where reclaimed water mains are stubbed out for future extension and the distance from the isolation valve to the plug is 40' or greater a Temporary Blow-off Assembly (Standard Detail 508-3.3A) shall be installed.

## **505.2.2 RECLAIMED WATER VALVES**

- 505.2.2.1** Reclaimed water valves two inches (2") through ten inches (10") shall be gate valves. Valves twelve inches (12") and larger shall be butterfly valves.
- 505.2.2.2** Valves shall be spaced at intervals not to exceed 1,000', or as approved by the **CITY ENGINEER** and **UTILITY DIRECTOR**.
- 505.2.2.3** Reclaimed water valves shall be placed on either side of the pavement where reclaimed water mains cross highways consisting of four or more lanes of traffic.
- 505.2.2.4** Reclaimed water valves shall be placed at all tees where branch lines are to be installed to provide maximum control of the distribution system. Valves shall be installed adjacent to tees except where valve boxes would fall in a curb face the valve may be adjusted away from the tee, subject to approval of the **CITY ENGINEER** and **UTILITY DIRECTOR**.
- 505.2.2.5** Reclaimed water valves shall be placed on all services two inches (2") or greater. Valves shall be located at the tee.

## **505.2.3 FIRE SERVICES**

- 505.2.3.1** The use of reclaimed water for fire service must be approved prior to use. Reclaimed water fire hydrants shall be spaced 500' apart plus or  $\pm$  150'. Hydrants shall be spaced so that the farthest corner of any property or building is no more than 500' from a hydrant as a fire hose would be laid.
- 505.2.3.2** A minimum distance of three feet (3') shall be maintained from any obstruction such as fences, buildings, trees, etc. In no case shall the distance from the right-of-way line to the fire hydrant be less than three feet (3') unless an easement is provided to insure setback requirements.
- 505.2.3.3** Fire hydrants shall be factory painted purple signifying reclaimed water.
- 505.2.3.4** Where fire hydrants or fire sprinkler systems are to be installed on private property, fire flow assemblies shall be installed in the fire lines at the right-of-way line on the property owner's side.
- 505.2.3.5** A Fire Flow Assembly shall be installed where one (1) line is run into a property and at some point downstream from the assembly and along the main, separate reclaimed water mains are branched off.

## **505.2.4 RECLAIMED WATER SERVICES**

- 505.2.4.1** Reclaimed water services shall be installed at property corners and may be either single or double type services.

- 505.2.4.2** Minimum size service pipe for three or more meters on one service connection shall be two inches (2").
- 505.2.4.3** Meters shall be installed as specified in Standard Detail 508-2.
- 505.2.4.4** For commercial subdivisions, the water service pipe, from the main to the metered location, shall be two inches (2") minimum.
- 505.2.4.5** Reclaimed water meters shall be located at the right of way line and on the property owner's side of the right of way line, six feet (6') from water meters.
- 505.2.4.6** Where the service main is two inches or above and on which a two inch (2") or above Gate Valve and Valve Box is installed within the right of way, the developer shall furnish to the **CITY** a "Valve Tie Sheet" as specified in Section 506.3 of this manual.

### **505.2.5 SITE PLANS**

The following information is required on site plans prior to approval.

- 505.2.5.1** The location of all existing and new reclaimed water mains and services relative to this site are to be shown. Indicate the size and pipe material.
- 505.2.5.2** The location and size of reclaimed water meters (existing and proposed) shall be shown.
- 505.2.5.3** The size and type of service pipe from the main to the meter and meter to the building shall be shown.
- 505.2.5.4** Maintain proper separation between water and sewer lines as specified in Paragraph 505.2.1.2 above.
- 505.2.5.5** Reclaimed water mains, meters, valves, hydrants, etc., shall be clearly identified as existing or proposed.
- 505.2.5.6** Reclaimed water meters shall not be installed in sidewalks. Where existing meters fall within the area of new sidewalk construction, the meter shall be moved to the property owner's side of the right of way line.
- 505.2.5.7** Under general notes or site information show the average daily reclaimed water demand anticipated.
- 505.2.5.8** Fire hydrants shall be factory painted "Purple" as specified in Section 505.2.3.4 above.
- 505.2.5.9** Reclaimed water services over two inches (2") are to be installed by developer to **CITY** standards. Meter, vault and appurtenant equipment are to be furnished and installed by Developer.

**505.2.5.10** Where existing water main easements fall within or are related to the development, the Official Records (OR) Book and Page shall be shown.

**505.2.5.11** Where a tap, two inch (2") or larger, is made into a **CITY** reclaimed water main the valves(s) shall be referenced in accordance with Section 506.3 of this manual, and a copy of its valve tie sheet shall be delivered to **CITY ENGINEER** and **UTILITY DIRECTOR**.

**505.2.5.12** Sites with multiple units shall have individual meters installed to each unit. Note should be shown that each meter box shall clearly identify what unit the meter serves.

**505.3** **CONSTRUCTION OF RECLAIMED WATER SYSTEM** – Install in accordance with Section 501 of this manual.

#### **505.4** **POLICIES**

##### **505.4.1** **EXTENDING CITY RECLAIMED WATER**

**505.4.1.1** The City of Valdosta will be developing a master plan for the extension of the reclaimed water system. Any extensions, either constructed by the **CITY** or by private developers, will have to adhere to the plan.

**505.4.1.2** The **CITY** will require that any land or development receiving reclaimed water services from the **CITY** will annex into the **CITY** if or when it is contiguous to the **CITY**. Property owners will be required to execute the appropriate documents for annexation prior to connection.

**505.4.1.3** All new residential, commercial, or industrial structures with needs for reclaimed water in the **CITY** shall connect to the **CITY** water system if available within (500’).

**505.4.1.4** Where reclaimed water is required to be extended in order for a development to adhere to the policies set for herein, it is the policy of the **CITY** that the applicant requiring the extension provide a request to the office of the **UTILITY DIRECTOR** for the extension. Requests to extend the **CITY** reclaimed water must be in the form of either a written request. Written requests shall contain the following information:

- A) Owner of the property
- B) Owner's address
- C) Property Appraiser's tax number
- D) Sketch, plan or map showing the location of the property.
- E) Legal description of the property

- 505.4.1.5** All extensions shall be in accordance with the requirements and specifications of this City of Valdosta Volume I, Standard Specifications for Water and Sewer Construction. The cost of the extension shall include but not be limited to administration, engineering, surveying, inspection, testing, permits, pipes, fire hydrants, valves, fittings, appurtenances, construction, financing, and other costs relating to the construction of the extension. The extension shall be designed in accordance with the provisions of this section.
- 505.4.1.6** The minimum size reclaimed water main for distribution of any nature shall be two inches (2"). Standard sizes of reclaimed water mains shall be 2", 4", 6", 8", 12", 16", 18", 20" and 24". The sizes and locations of reclaimed water mains shall be determined by the **UTILITY DIRECTOR** who shall be responsible for evaluating the needs of the **CITY** as expressed in general terms by the City's proposed Reclaimed Water Master Plan and the needs of a specific area to be served by any proposed extension.
- 505.4.1.8** For all extensions, any over-sizing required by the applicant and specific items of work required by the applicant shall be paid for by the applicant with no reimbursement.
- 505.4.1.9** No extension will be made outside the **CITY** limits unless the applicant agrees to annex all property to be served or if the applicant's property is not annexable, agrees by appropriate document to annex into the **CITY** upon the property becoming annexable, and is approved by City Council.
- 505.4.1.14** Construction of the extension shall be in accordance with plans and specifications approved by the **CITY ENGINEER** and **UTILITY DIRECTOR** and may be by contract awarded by the **CITY**, by **CITY** forces, or by the applicant with the approval of the City Council, all as addressed by the agreement between the **CITY** and the applicant.

**DIVISION 500**

**SECTION 506**

**RECLAIMED WATER  
SYSTEM**

**ASBUILTS**

**SECTION 506**  
**RECLAIMED WATER SYSTEM ASBUILTS**

**506.1 GENERAL**

- 506.1.1** All as-builts for projects are required to be on at least 24" x 36" paper, and shall bear the name, address, and telephone number of the firm preparing the drawing and the date the as-built data is added to the original via the revision block. 3-sets of plans and one electronic copy of the plans are required to be submitted. The electronic AutoCAD drawing files shall be referenced to Georgia State Plane Coordinates, West Zone (NAD 83, 2007 adjustment) and NAVD 88.
- 506.1.2** Surveyor's statement (with seal and with an original signature on each sheet) shall verify that as-built drawings reflect the true conditions in the field or Engineer's statement (with seal and an original signature on each sheet) shall state that the project will function as was originally intended on the approved construction plans.
- 506.1.3** Contractors' statement (with an original signature on each sheet) shall verify that all construction specifications and product qualities have been met or exceeded.
- 506.1.4** "AS-BUILT DRAWING" or "RECORD DRAWING", the name of the project and the date shall be clearly labeled on each sheet.
- 506.1.5** Street names shall be on all streets. All easements and right-of-ways shall be shown and clearly labeled.
- 506.1.6** If the utility system is to be private (not to be dedicated to City), then so state on each sheet.
- 506.1.7** The location and elevation of the benchmark referenced will be shown on the drawing. If the referenced benchmark is not within the project, then a complete description of its location will be provided to assist in future locating.
- 506.1.8** The locations and description of any utility lines and other installations of any kind or other description known to exist within the construction area. The location includes dimensions to permanent features. The construction area is defined as the area on site that is disturbed.
- 506.1.9** The locations and dimensions of any changes to buildings and structures.
- 506.1.10** Correct grade and alignment of roads.
- 506.1.11** Changes in details of design or additional information such as approved placement details, pipe sizes, material changes, etc.

## **506.2 ASBUILT PLANS**

### **506.2.1 General**

The following information is required on all as-built drawings. The **CONTRACTOR** shall note that additional information may be required by the **CITY ENGINEER** when deemed necessary.

### **506.2.2 Public Projects**

- 506.2.2.1** Locate valves, fittings, and services that are located within the City right-of-way or easement in two directions horizontally. All fire lines, fire hydrants, and fire appurtenances shall be located. Swing ties should be made from objects that are permanent in nature and visible on the finished surface.
- 506.2.2.2** On new construction, lot lines may be used to locate reuse water services. Locations shall be perpendicular to the right-of-way and parallel to the water main. Radial ties are not acceptable.
- 506.2.2.3** Permanent structures that are properly located on the drawings may also be used.
- 506.2.2.4** All horizontal distances shall be shown to the nearest tenth of a foot (i.e., 56.3'). All vertical distances shall be shown to the nearest tenth of a foot (i.e., 217.6').
- 506.2.2.5** Show all sizes and types of valves and pipes.
- 506.2.2.6** Special detail drawings may be required where installations are not shown on approved construction drawings for whatever reason or where required for clarity.
- 506.2.2.7** Show location and elevations on pipes and fittings where changes in direction occur and at a maximum of every 100'.
- 506.2.2.8** Typical reuse water service installation details with deviations from original plans shall be noted on as-built drawings.

### **506.2.3 Private Projects**

- 506.2.3.1** Locate valves, fittings, and services that are located within the City right-of-way or easement in two directions horizontally. All fire hydrants, fire lines, and fire appurtenances shall be located. Fire line location shall be shown at a maximum of every 100' or where there is a change in direction. Swing ties should be made from objects that are permanent in nature and visible on the finished surface.
- 506.2.3.2** On new construction, lot lines may be used to locate reuse water services. Locations shall be perpendicular to the right-of-way and parallel to the water main. Radial ties are not acceptable.
- 506.2.3.3** Permanent structures that are properly located on the drawings may also be used.

- 506.2.3.4 All horizontal distances shall be shown to the nearest tenth of a foot (i.e., 56.3'). All vertical distances shall be shown to the nearest tenth of a foot (i.e., 217.6').
- 506.2.3.5 Show all sizes and types of valves and pipes.
- 506.2.3.6 Special detail drawings may be required where installations are not shown on approved construction drawings for whatever reason or where required for clarity.
- 506.2.3.7 Show location and elevations on pipes and fittings located within the City right-of-way or easement where changes in direction occur and at a maximum of every 100'.
- 506.2.3.8 Typical reuse water service installation details with deviations from original plans shall be noted on as-built drawings.

### 506.3 VALVE TIE DATA

- 486.3.1.1 All in-line valves shall be tied to three (3) reference points, fire hydrants shall be tied to two (2) reference points.
- 486.3.1.2 All distances shall be measured to the nearest tenth of a foot and shall be measured from the center of the valve cover to the center of circular reference points and to the nearest point of other reference points.
- 486.3.1.3 All reference points shall be within 100'' of the valve, except when unable to give proper references. A break line may be used as needed.
- 486.3.1.4 All valves within 100' of an intersection shall be carried on the same sheet.
- 486.3.1.5 The perpendicular distance between all in-line valves and centerline of the paved road or centerline of right-of-way/easement for unpaved roads shall be shown and drawn to scale. (This is not to be considered as one of the points).
- 486.3.1.6 All right-of-way or easement widths shall be indicated on each tie sheet and the reuse water main shall have reference points to each.
- 486.3.1.7 All reducers and bends shall be shown in their relative position. References to reducers and bends shall be shown on the as-built plan sheet.

### 506.3.3 Acceptable Tie Point Objects (Reference Points)

- 506.3.3.1 Selection of reference points should be based on: 1) distance between the valve and the reference point; 2) order of the reference point in the tabulation below; 3) field conditions; and 4) the judgment of the registered mapper and surveyor or ultimately the judgement of the **CITY ENGINEER**.
- 506.3.3.2 Acceptable Reference Points in order of preference:

- 506.3.3.2.1 Manholes - indicate in parenthesis: (SAN) for sanitary, (STM) for storm, and (TEL) for telephone.
- 506.3.3.2.2 Concrete utility pole (Indicate pole number in parenthesis).
- 506.3.3.2.3 Fire Hydrant (center of operating nut).
- 506.3.3.2.4 Building Corner. (The shape, type, and address of the building shall be shown).
- 506.3.3.2.5 Wood Utility Pole - (Indicate pole number in parenthesis).
- 506.3.3.2.6 "X" cut in curb. Cut shall be at least 3" X 3" and ¼" deep and located on the curbs upper vertical face. (Miami type curb shall have the cut made on the customer's side of the curb). Paint the "X" in blue paint.
- 506.3.3.2.7 Railroad spike in tree (min. 12" dia.) within right-of-way placed two feet (2') above ground extending two inches (2") and on side of tree facing road.
- 506.3.3.2.8 Intersection of centerline of the street, or street and driveway - The street address of driveway must be shown. (A railroad spike shall be placed at the point of intersection).
- 506.3.3.2.9 Concrete or metal culvert ends - (The culvert shall be accurately sketched and specified).
- 506.3.3.2.10 Reuse Water Meter Box - (Indicate the street address of the buildings served, in parenthesis).
- 506.3.3.2.11 Existing concrete monuments.
- 506.3.3.2.12 Street Sign - (Indicate type of sign in parenthesis).
- 506.3.3.1.13 Another valve.
- 506.3.3.2.14 Any of the previous reference points between 100' and 200' from a valve.

#### **506.4 PROCEDURE FOR SUBMITTING ASBUILTS**

- 506.4.1 Original Submittal – A total of three (3) copies of all required as-built material including valve ties shall be submitted to the **CITY ENGINEER**. No originals or certified copies shall be submitted at this time. Submittals must be furnished with a cover sheet or letter of transmittal. As-builts submitted without cover sheets will not be accepted.
- 506.4.2 Review – As-builts submitted shall be reviewed for content and compliance to as-built requirements. If the as-builts are found to be incomplete, one set of as-builts shall be returned with comments marked in red. The submittee shall correct the as-builts as indicated on the drawings. Resubmit as described in Paragraph 506.4.3 below. If the information is correct, the submittee will be notified and the final as-builts shall then be delivered to the **CITY ENGINEER** as described in Paragraph 506.4.4 below.

**506.4.3** Re-submittal - After all corrections, additions, or deletions have been made, the as-builts shall then be resubmitted. Three (3) sets of those items that were returned for corrections along with the red lined set shall be re-submitted. **Re-submittal without the red lined set will be refused.** No re-submittals will be accepted without a cover sheet. No originals or certified copies shall be submitted at this time. Review of resubmitted as-builts shall be as described in Paragraph 506.4.2 above.

**506.4.4** Final Submittal - After all as-builts have been reviewed and comply with all as-built requirements, the **CITY ENGINEER** shall notify the submittee to submit final as-builts. Final as-builts shall include a cover letter, two copies of the as-builts signed, sealed and dated by a professional mapper and surveyor, and one CD or DVD with one reproducible original submitted in a form as described in 506.1.1. The submittee shall note that only one copy shall be required to be signed and sealed.

**DIVISION 500**

**SECTION 507**

**RECLAIMED WATER  
SYSTEM**

**MEASUREMENT  
AND  
PAYMENT**

**SECTION 507**  
**RECLAIMED WATER SYSTEM MEASUREMENT AND PAYMENT**

**507.1 GENERAL**

- 507.1.1** All measurements and payments shall be based on completed work performed in strict accordance with the drawings and specifications, and in accordance with the unit and lump sum prices in the Proposal.
- 507.1.2** Each unit or lump sum price stated in the proposal shall constitute full compensation for each complete item of work and shall be installed prices, complete.
- 507.1.3** The **CONTRACTOR** shall be responsible for any debris and foreign matter which is allowed to enter the system as a result of construction and shall be solely responsible for any damage resulting therefrom.
- 507.1.4** Whenever any authorized change or combination of changes in the plans results in an increase or decrease in the original contract quantities, and the work added or eliminated is of the same general character as that shown on the original plans, the **CONTRACTOR** shall accept payment in full at the original contract unit prices for actual quantities of work done, and no allowance will be made for any loss of anticipated profits because of increases or decreases in quantities; providing, however, that increased or decreased work covered by a supplemental agreement shall be paid for as stipulated in such agreement.
- 507.1.5** The **CITY ENGINEER** and **UTILITY DIRECTOR** shall have the right to make alterations in the plans or character of the work as may be considered necessary or desirable during the progress of the work for satisfactory completion of the proposed construction, provided that no alteration shall be made which will result in a substantial change in the general plan or character of the work, such as to evade the competitive bidding statute. Alterations provided for herein shall not be considered as a waiver of any conditions of the contract or the bond, nor to invalidate any of the provisions thereof.
- 507.1.6** These specifications, the plans, special provisions, and all supplementary documents are integral parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In addition to the work and materials specifically called for in the specifications as being included in any specific pay item, additional incidental work, not specifically mentioned, will be included in such pay items when so shown in the plans, or if indicated, or obvious and apparent, as being necessary for the proper completion of the work under such pay item and not stipulated as being covered under other pay items. No additional compensation shall be allowed for such incidental work. In case of discrepancy, computed dimensions shall govern overscaled dimensions, plans shall govern over standard specifications, and special provisions shall govern over both standard specifications and plans unless otherwise specified by the **CITY ENGINEER** and **UTILITY DIRECTOR**.
- 507.1.7** The **CONTRACTOR** is warned that some abandonments of portions of the reclaimed water system, as well as connections, replacements, extensions thereto and thereof

may necessitate work being done after or before normal work hours, said decision resting solely with the **CITY ENGINEER** and **UTILITY DIRECTOR**. Normally such work will be required only to maintain service to existing customers or to minimize inconvenience to those customers or members of the public. However, this work shall be considered incidental to the construction and no additional compensation shall be allowed therefore.

- 507.1.8** Unless otherwise provided in the specifications for the particular items involved, all measurements shall be taken from “finished grades and elevations” for vertical measurements, and from end of pipe to end of pipe horizontally for lineal measurements. The method or combination of methods or measurements shall be those which will reflect, with reasonable accuracy, the actual areas of the finished work as determined by the **CITY ENGINEER** and **UTILITY DIRECTOR**.
- 507.1.9** Unless provided by specific bid items in the Schedule of Prices Bid, compensation for any and all clearing and grubbing which may be required for the work shall be deemed to have been included in the payments for bid items to which said clearing and grubbing is incidental and no additional compensation shall be allowed therefore.
- 507.1.10** The **CONTRACTOR** shall not be allowed additional payment or compensation for removing and replacing, relocating, or otherwise protecting or adjusting existing culverts or other existing storm water facilities which may be affected by the construction. The cost thereof shall be included in the cost of bid items to which they are incidental or appurtenant.
- 507.1.11** Except those items outlined in the Schedule of Prices Bid, the **CONTRACTOR** shall not be allowed additional payment or compensation for removing and replacing, shoring or bracing, relocating, or otherwise protecting or adjusting any and all utilities which may be affected by the construction. Specifically, the **CONTRACTOR** shall adjust all valve boxes and covers to required grades. All methods of adjusting utilities shall be subject to the approval of the **CITY ENGINEER** and **UTILITY DIRECTOR**. The cost of items described herein shall be included in the cost of bid items to which they are incidental or appurtenant.
- 507.1.12** It is the intent of this contract that all pavement replacement including trench width, resurfacing, and full width be done at the same time.
- 507.1.13** Pipe which has not been properly laid, bedded, jointed, or backfilled shall not be included for payment in any pay estimate.
- 507.1.14** The term “finished grade”, as used herein, shall mean the final elevation of the accepted work as approved by the **CITY ENGINEER** and in **GDOT** right-of-way, shall be the elevation required and approved by the **GDOT** to conform to its work as proposed or later modified. The **CONTRACTOR** will be responsible for determining the finished grade at any point as required by the **CITY ENGINEER** or **GDOT**.
- 507.1.15** No additional payment shall be made for the furnishing and installing of locating wire(s). The cost thereof shall be included in the unit price for the particular pipe installation for which it is called.

**507.2 DETAILED MEASUREMENT AND PAYMENT**

**507.2.1** The following list of pay items are standard items used by the **CITY** for reclaimed water construction. This list includes pay item numbers and the detailed measurement and payment relating to those items. To determine measurement and payment for items not listed below, refer to other sections of the Standard Specifications or Contract Documents of the project.

**507.2.2** **Reserved**

**507.2.3** **Standard Pay Items**

**507 RECLAIMED WATER SYSTEM**

**507-01 RECLAIMED WATER PIPING**

507-01.01 Reclaimed Water PVC Piping

507-01.01.01	2" PVC Reuse Water Main	LF
507-01.01.02	4" PVC Reuse Water Main	LF
507-01.01.03	6" PVC Reuse Water Main	LF
507-01.01.04	8" PVC Reuse Water Main	LF
507-01.01.05	10" PVC Reuse Water Main	LF
507-01.01.06	12" PVC Reuse Water Main	LF

507-01.02 Reclaimed Water DIP Piping

507-01.02.01	4" DIP Reuse Water Main	LF
507-01.02.02	6" DIP Reuse Water Main	LF
507-01.02.03	8" DIP Reuse Water Main	LF
507-01.02.04	10" DIP Reuse Water Main	LF
507-01.02.05	12" DIP Reuse Water Main	LF
507-01.02.06	16" DIP Reuse Water Main	LF
507-01.02.07	18" DIP Reuse Water Main	LF
507-01.02.08	20" DIP Reuse Water Main	LF
507-01.02.09	24" DIP Reuse Water Main	LF

507-01.04 PVC Fittings

507-01.04.01	1" PVC Fittings	EA
507-01.04.02	2" PVC Fittings	EA
507-01.04.03	4" PVC fittings	EA
507-01.04.04	6" PVC Fittings	EA
507-01.04.05	8" PVC Fittings	EA
507-01.04.06	Reserved	
507-01.05.01	PVC Flanged Piping & Fittings	LS

Measurement of reclaimed water mains for payment shall be in linear feet of actual pipe installed end to end.

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, pipe installation, and other items required to complete the installation.

507-01.06 Compact DIP Fittings

507-01.06.01	Reserved	
507-01.06.02	Compact DIP Fittings, 6"	TON
507-01.06.03	Compact DIP Fittings, 8"	TON
507-01.06.04	Reserved	
507-01.06.05	Compact DIP Fittings, 12"	TON
507-01.06.06	Compact DIP Fittings, 14"	TON
507-01.06.07	Compact DIP Fittings, 16"	TON
507-01.06.08	Compact DIP Fittings, 18"	TON
507-01.06.10	DIP Flanged Piping & Fittings	LS
507-01.07.01	4" DIP MJ 22 ½ ° Bend	EA
507-01.07.02	4" DIP MJ 45° Bend	EA
507-01.07.03	4" DIP MJ 90° Bend	EA
507-01.08.01	6" DIP MJ 22 ½ ° Bend	EA
507-01.08.02	6" DIP MJ 45° Bend	EA
507-01.08.03	6" DIP MJ 90° Bend	EA
507-01.08.04	6" DIP MJ Tee	EA
507-01.08.05	6" DIP MJ Plug	EA
507-01.09.01	8" DIP MJ 22 ½ ° Bend	EA
507-01.09.02	8" DIP MJ 45° Bend	EA
507-01.09.03	8" DIP MJ 90° Bend	EA
507-01.09.04	8" DIP MJ Tee	EA
507-01.09.05	8" DIP MJ Plug	EA
507-01.10.01	Reserved	
507-01.11.01	12" DIP MJ 22 ½ ° Bend	EA
507-01.11.02	12" DIP MJ 45° Bend	EA
507-01.11.03	12" DIP MJ 90° Bend	EA
507-01.11.04	12" DIP MJ Tee	EA
507-01.11.05	12" DIP MJ Plug	EA
507-01.12.01	14" DIP MJ 22 ½ ° Bend	EA
507-01.12.02	14" DIP MJ 45° Bend	EA
507-01.12.03	14" DIP MJ 90° Bend	EA
507-01.12.04	14" DIP MJ Tee	EA
507-01.12.05	14" DIP MJ Plug	EA
507-01.13.01	16" DIP MJ 22 ½ ° Bend	EA
507-01.13.02	16" DIP MJ 45° Bend	EA
507-01.13.03	16" DIP MJ 90° Bend	EA
507-01.13.04	16" DIP MJ Tee	EA
507-01.13.05	16" DIP MJ Plug	EA
507-01.14.01	Coated Steel Pipe Supports	EA
507-01.14.02	Stainless Steel Pipe Supports	EA
507-01.14.03	Concrete Pipe Supports	EA

507-01.15.01	Standard DIP Fittings, 18"	TON
507-01.15.02	Reserved	
507-01.15.03	Standard DIP Fittings, 24"	TON
507-01.15.04	Reserved	
507-01.16.01	18" DIP MJ 22 ½ ° Bend	EA
507-01.16.02	18" DIP MJ 45° Bend	EA
507-01.16.03	18" DIP MJ 90° Bend	EA
507-01.16.04	18" DIP MJ Tee	EA
507-01.16.05	18" DIP MJ Plug	EA
507-01.17.01	20" DIP MJ 22 ½ ° Bend	EA
507-01.17.02	20" DIP MJ 45° Bend	EA
507-01.17.03	20" DIP MJ 90° Bend	EA
507-01.17.04	20" DIP MJ Tee	EA
507-01.17.05	20" DIP MJ Plug	EA
507-01.18.01	24" DIP MJ 22 ½ ° Bend	EA
507-01.18.02	24" DIP MJ 45° Bend	EA
507-01.18.03	24" DIP MJ 90° Bend	EA
507-01.18.04	24" DIP MJ Tee	EA
507-01.18.05	24" DIP MJ Plug	EA

Payment for these bid items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, fitting and accessories installation, and other items required to complete the installation.

## **507-02 WATER VALVES**

507-02.01.01	2" Gate Valve and Valve Box	EA
507-02.01.02	4" Gate Valve and Valve Box	EA
507-02.01.03	6" Gate Valve and Valve Box	EA
507-02.01.04	8" Gate Valve and Valve Box	EA
507-02.01.05	Reserved	
507-02.02.01	Reserved	
507-02.03.01	4" Flanged Gate Valve	EA
507-02.03.02	6" Flanged Gate Valve	EA
507-02.03.03	8" Flanged Gate Valve	EA
507-02.04.01	12" Butterfly Valve and Valve Box	EA
507-02.04.02	14" Butterfly Valve and Valve Box	EA
507-02.04.03	16" Butterfly Valve and Valve Box	EA
507-02.04.04	18" Butterfly Valve and Valve Box	EA
507-02.04.05	20" Butterfly Valve and Valve Box	EA
507-02.04.06	24" Butterfly Valve and Valve Box	EA
507-02.05.01	Remove & Replace 12" Butterfly Valve	EA
507-02.06.01	12" Flanged Butterfly Valve	EA
507-02.06.02	Reserved	
507-02.06.03	16" Flanged Butterfly Valve	EA
507-02.06.04	18" Flanged Butterfly Valve	EA
507-02.07.01	4" Flanged Check Valve	EA
507-02.07.02	6" Flanged Check Valve	EA

507-02.07.03	8" Flanged Check Valve	EA
507-02.07.04	10" Flanged Check Valve	EA
507-02.07.05	12" Flanged Check Valve	EA
507-02.08.01	4" Flanged Magmeter	EA
507-02.08.02	6" Flanged Magmeter	EA
507-02.08.03	8" Flanged Magmeter	EA
507-02.08.04	10" Flanged Magmeter	EA
507-02.08.05	12" Flanged Magmeter	EA
507-02.09.01	Air Release Valve Assembly – Type A	EA
507-02.09.02	Air Release Valve Assembly – Type B	EA
507-02.09.03	Air Release Valve Assembly – Type C	EA

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, valve and accessories installation, and other items required to complete the installation.

### **507-03 FIRE HYDRANTS**

507-03.01.01	Fire Hydrant Assembly on 8" Main, Type A	EA
507-03.01.02	Reserved	
507-03.01.03	Fire Hydrant Assembly on 12" Main, Type A	EA
507-03.01.04	Reserved	
507-03.01.05	Fire Hydrant Assembly on 16" Main, Type A	EA
507-03.01.06	Fire Hydrant Assembly on 18" Main, Type A	EA
507-03.01.07	Fire Hydrant Assembly on 20" Main, Type A	EA
507-03.01.08	Fire Hydrant Assembly on 24" Main, Type A	EA
507-03.02.01	Fire Hydrant Assembly on 8" Main, Type B	EA
507-03.02.02	Reserved	
507-03.02.03	Fire Hydrant Assembly on 12" Main, Type B	EA
507-03.02.04	Reserved	
507-03.03.01	Fire Hydrant Assembly on 8" Main, Type C	EA
507-03.03.02	Reserved	
507-03.03.03	Fire Hydrant Assembly on 12" Main, Type C	EA
507-03.03.04	Reserved	
507-03.04.01	Fire Hydrant Assembly on 8" Main, Type D	EA
507-03.04.03	Fire Hydrant Assembly on 12" Main, Type D	EA
507-03.05.01	Fire Hydrant Extension	EA
507-03.05.02	Reserved	

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, hydrant installation, and other items required to complete the project.

### **507-04 RECLAIMED WATER SERVICES**

507-04.01.01	¾" Single Reclaimed Water Service – Short Side	EA
507-04.01.02	¾" Single Reclaimed Water Service – Long Side	EA

507-04.02.01	1" Single Reclaimed Water Service – Short Side	EA
507-04.02.02	1" Single Reclaimed Water Service – Long Side	EA
507-04.03.01	2" Single Reclaimed Water Service – Short Side	EA
507-04.03.02	2" Single Reclaimed Water Service – Long Side	EA
507-04.07.03	Reset Existing Gulf Boxes	EA
507-04.07.04	Reserved	

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, service installation, and other items required to complete the installation.

#### **507-05 WATER TAPS ON EXISTING RECLAIMED WATER MAINS**

507-05.01.01	Reserved	
507-05.01.02	2" Tap on Existing 6" Reclaimed Water Main w/Valve	EA
507-05.01.03	2" Tap on Existing 8" Reclaimed Water Main w/Valve	EA
507-05.01.04	Reserved	
507-05.01.05	2" Tap on Existing 12" Reclaimed Water Main w/Valve	EA
507-05.04.01	Reserved	
507-05.04.02	6" Tap on Existing 6" Reclaimed Water Main w/Valve	EA
507-05.04.03	6" Tap on Existing 8" Reclaimed Water Main w/Valve	EA
507-05.04.04	Reserved	
507-05.04.05	6" Tap on Existing 12" Reclaimed Water Main w/Valve	EA
507-05.04.06	Reserved	
507-05.05.01	8" Tap on Existing 8" Reclaimed Water Main w/Valve	EA
507-05.05.02	Reserved	
507-05.05.03	8" Tap on Existing 12" Reclaimed Water Main w/Valve	EA
507-05.05.04	Reserved	
507-05.06.01	10" Tap on Existing 10" Reclaimed Water Main w/Valve	EA
507-05.06.02	10" Tap on Existing 12" Reclaimed Water Main w/Valve	EA
507-05.06.03	Reserved	
507-05.07.01	12" Tap on Existing 12" Reclaimed Water Main w/Valve	EA
507-05.07.02	Reserved	

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, tap installation, and other items required to complete the installation.

#### **507-06 BORING AND JACKING**

507-06.01.01	Bore and Jack 18" Steel Casing w/8" DIP	LF
507-06.01.02	Bore and Jack 18" Steel Casing w/8" PVC	LF
507-06.02.01	Reserved	
507-06.02.02	Reserved	
507-06.02.03	Bore and Jack 24" Steel Casing w/12" DIP	LF
507-06.02.04	Bore and Jack 24" Steel Casing w/12" PVC	LF
507-06.03.01	Reserved	

507-06.03.02	Reserved	
507-06.03.03	Bore and Jack 30" Steel Casing w/16" DIP	LF
507-06.03.04	Reserved	
507-06.03.05	Reserved	
507-06.03.06	Reserved	
507-06.04.01	Reserved	
507-06.04.02	Reserved	
507-06.04.03	Bore and Jack 36" Steel Casing w/18" DIP	LF
507-06.04.04	Reserved	
507-06.04.06	Reserved	
507-06.05.02	Reserved	
507-06.05.03	Bore and Jack 48" Steel Casing w/24" DIP	LF
507-06.05.04	Reserved	
507-06.10.01	2" Casing	LF
507-06.10.02	4" Casing	LF
507-06.10.03	6" Casing	LF
507-06.10.04	8" Casing	LF

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, casing installation, pipe installation, and other items required to complete the bore and jack installation.

**507-07 RECLAIMED WATER MAIN UNDER PAVEMENT**

507-07.01.01	Push 1" PVC Reclaimed Water Main Under Asphalt	LF
507-07.01.02	Push 2" PVC Reclaimed Water Main Under Asphalt	LF
507-07.02.01	Missile 1" Reclaimed Water Main	LF
507-07.02.02	Missile 1" Reclaimed Water Main w/Casing	LF
507-07.02.03	Missile 2" Reclaimed Water Main	LF
507-07.02.04	Missile 2" Reclaimed Water Main w/Casing	LF

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, directional bore, pipe installation, and other items required to complete the installation.

**507-09 BLOW-OFF ASSEMBLIES**

507-09.01.01	Reserved	
507-09.01.02	Reserved	
507-09.01.03	Temporary Blow-off Assembly on 6" Main	EA
507-09.01.04	Temporary Blow-off Assembly on 8" Main	EA
507-09.01.05	Reserved	
507-09.01.06	Temporary Blow-off Assembly on 12" Main	EA
507-09.01.07	Reserved	
507-09.01.08	Temporary Blow-off Assembly on 16" Main	EA
507-09.01.09	Temporary Blow-off Assembly on 18" Main	EA
507-09.03.01	Blow-off Assembly on 2" Main	EA

507-09.03.02	Reserved	
507-09.03.03	Blow-off Assembly on 6" Main	EA
507-09.03.04	Blow-off Assembly on 8" Main	EA
507-09.03.05	Reserved	
507-09.03.06	Blow-off Assembly on 12" Main	EA
507-09.03.07	Reserved	
507-09.03.08	Blow-off Assembly on 16" Main	EA
507-09.03.09	Blow-off Assembly on 18" Main	EA
507-09.03.10	Reserved	
507-09.03.11	Blow-off Assembly on 24" Main	EA

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, blow-off assembly installation, and other items required to complete the installation.

### **507-11 RECLAIMED WATER MAIN CONNECTIONS**

507-11.01.01	Connect New 2" Main to Existing 2" Main	EA
507-11.01.02	Reserved	
507-11.01.03	Connect New 2" Main to Existing 6" Main	EA
507-11.01.04	Connect New 2" Main to Existing 8" Main	EA
507-11.01.05	Reserved	
507-11.01.06	Connect New 2" Main to Existing 12" Main	EA
507-11.02.01	Connect New 4" Main to Existing 4" Main	EA
507-11.02.02	Connect New 4" Main to Existing 6" Main	EA
507-11.02.03	Connect New 4" Main to Existing 8" Main	EA
507-11.02.04	Reserved	
507-11.02.05	Connect New 4" Main to Existing 12" Main	EA
507-11.03.01	Connect New 6" Main to Existing 6" Main	EA
507-11.03.02	Connect New 6" Main to Existing 8" Main	EA
507-11.03.03	Reserved	
507-11.03.04	Connect New 6" Main to Existing 12" Main	EA
507-11.04.01	Connect New 8" Main to Existing 6" Main	EA
507-11.04.02	Connect New 8" Main to Existing 8" Main	EA
507-11.04.03	Reserved	
507-11.04.04	Connect New 8" Main to Existing 12" Main	EA
507-11.04.05	Reserved	
507-11.04.06	Connect New 8" Main to Existing 16" Main	EA
507-11.04.07	Connect New 8" Main to Existing 18" Main	EA
507-11.04.08	Reserved	
507-11.04.09	Connect New 8" Main to Existing 24" Main	EA
507-11.05.01	Connect New 10" Main to Existing 6" Main	EA
507-11.05.02	Connect New 10" Main to Existing 8" Main	EA
507-11.05.03	Reserved	
507-11.05.04	Connect New 10" Main to Existing 12" Main	EA
507-11.05.05	Reserved	
507-11.05.06	Connect New 10" Main to Existing 16" Main	EA
507-11.05.07	Connect New 10" Main to Existing 18" Main	EA

507-11.05.08	Reserved	
507-11.05.09	Connect New 10" Main to Existing 24" Main	EA
507-11.06.01	Connect New 12" Main to Existing 6" Main	EA
507-11.06.02	Connect New 12" Main to Existing 8" Main	EA
507-11.06.03	Reserved	
507-11.06.04	Connect New 12" Main to Existing 12" Main	EA
507-11.06.05	Reserved	
507-11.06.06	Reserved	
507-11.06.07	Connect New 12" Main to Existing 18" Main	EA

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, cutting of pipe, connections, accessories, and other items required to complete the installation.

### **507-12 ADJUSTMENTS**

507-12.01.01	Adjust Existing Reclaimed Water Valve Box	EA
507-12.01.02	Reserved	
507-12.02.01	Adjust Existing Reclaimed Water Meter Box	EA
507-12.02.02	Reserved	
507-12.03.01	Adjust Existing Fire Hydrant	EA

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all material costs, excavation, backfill, installation of adjustments, and other items required to complete the project.

### **507-13 TESTING**

507-13.01.01	Piping and Valve Disinfection	LS
507-13.02.01	Hydrostatic Testing	LS

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, test equipment, and other items required to complete the project.

### **507-14 JUMPER CONNECTION**

507-14.01.01	Temporary Jumper Connection	EA
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Payment for this pay item shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, backflow prevention equipment, piping, valves, and other items required to complete temporary assembly installation.

**507-20 ABANDONMENTS**

507-20.01.01	Abandon 2" Reclaimed Water Main	LS
507-20.01.02	Abandon 4" Reclaimed Water Main	LS
507-20.01.03	Abandon 6" Reclaimed Water Main	LS
507-20.01.04	Abandon 8" Reclaimed Water Main	LS
507-20.01.05	Abandon 10" Reclaimed Water Main	LS
507-20.01.06	Abandon 12" Reclaimed Water Main	LS

Payment for these pay items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Payment shall include all costs for excavation, backfilling, dewatering, cutting of pipe, removal of pipe, caps, plugs, and other items required to complete the project.

**DIVISION 500**

**SECTION 508**

**RECLAIMED  
WATER SYSTEM**

**STANDARD DETAILS**

## **SECTION 508**

### **RECLAIMED WATER SYSTEM STANDARD DETAILS**

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B. Single 1" Water Service, Residential Installation

C. Single 1" Water Service, Commercial Installation

D. Single 1 ½" and 2" Water Service

##### **508-3 WATER MAIN TAPS & BLOWOFFS**

508-3.1 Reserved

508-3.2 Water Main Taps

A. Water Main Tap for 2" Water Main

B. Water Main Tap for Water Mains 3" and Above

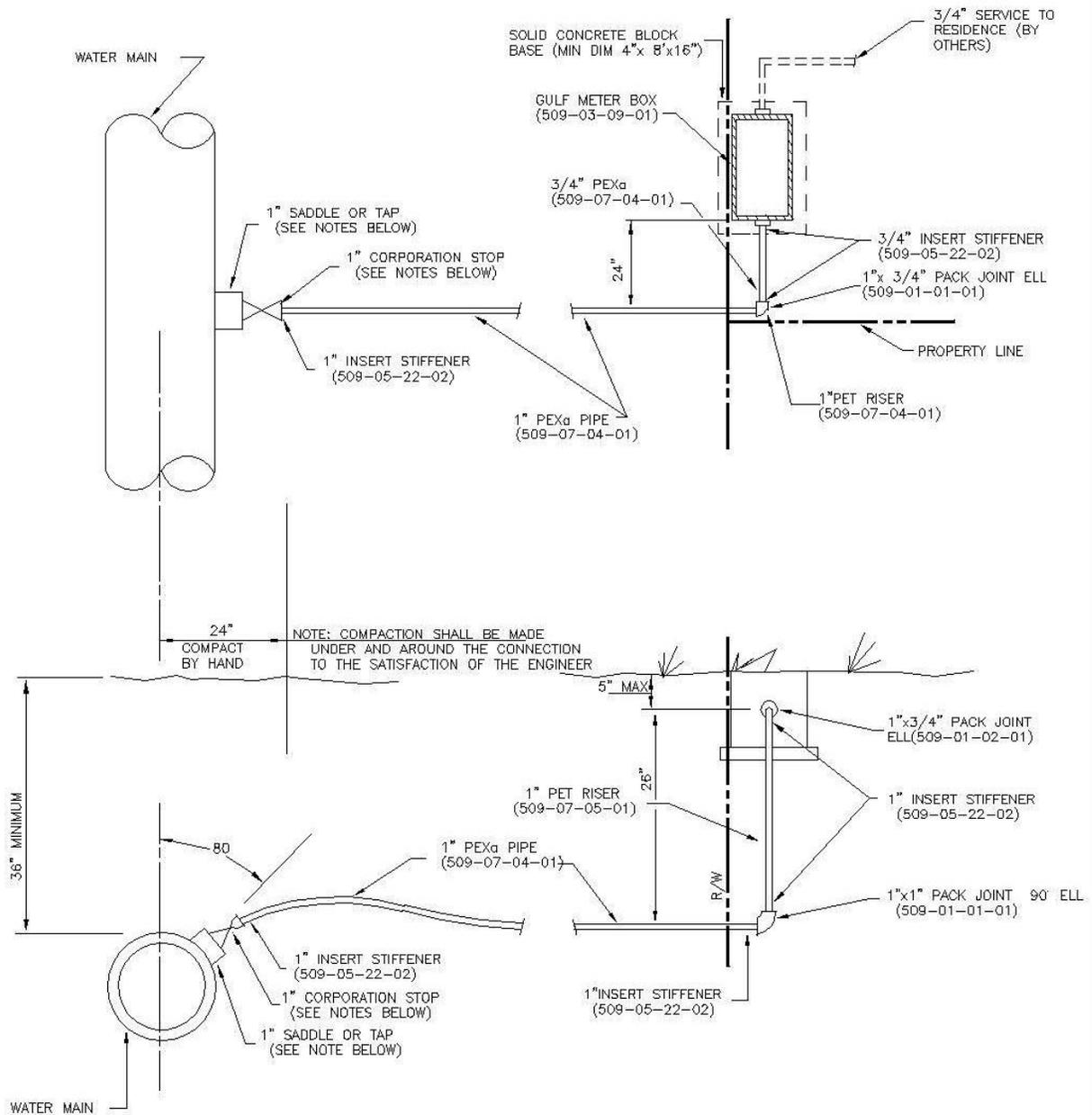
508-3.3 Reclaimed Water Main Blowoff Assembly

A. Temporary Blowoff Assembly

B. Permanent Blowoff Assembly

C. Construction Blowoff Assembly

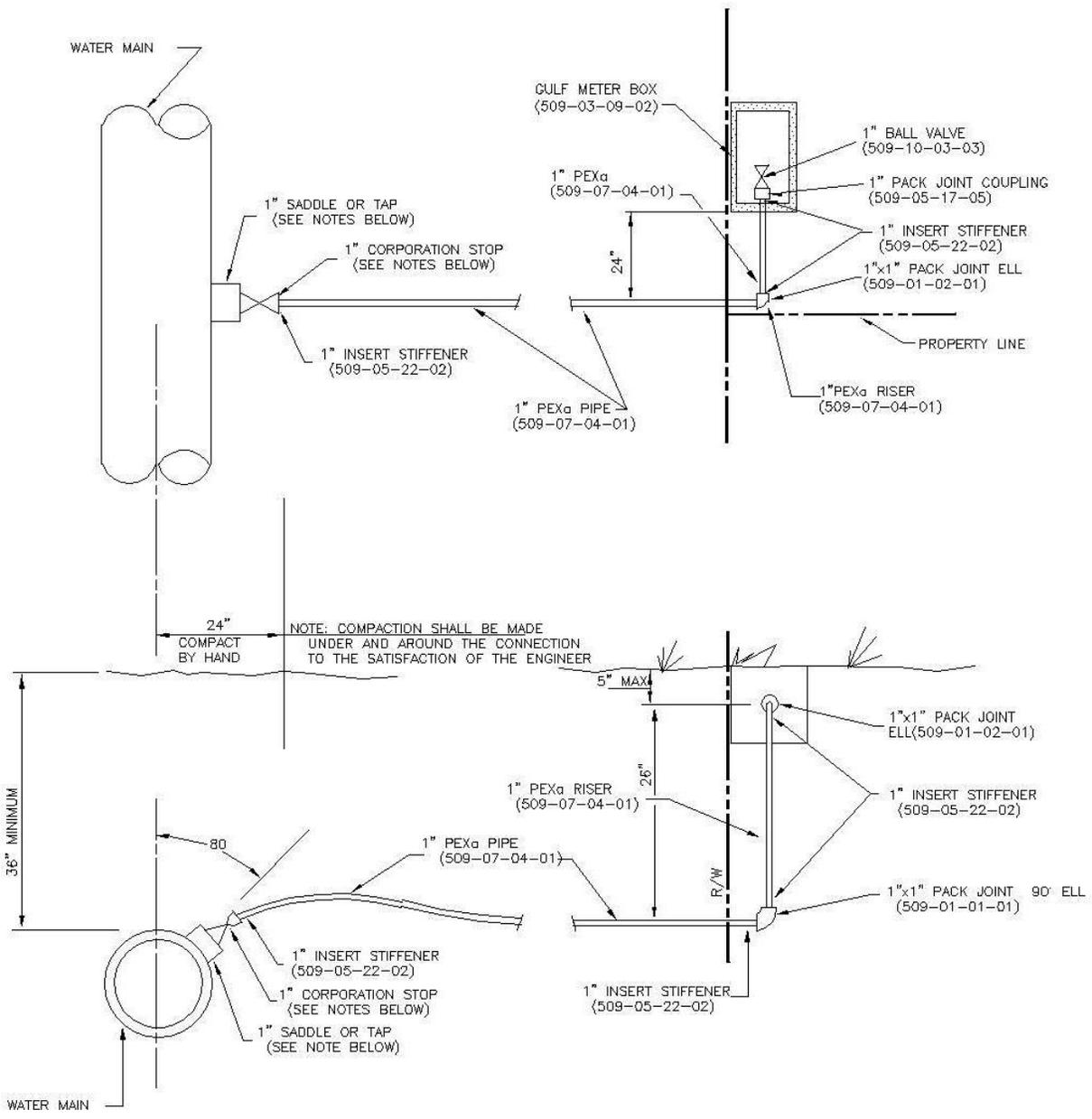




### NOTES

- METER BOXES SET IN PAVEMENT SHALL BE POLYMER CONCRETE (509-03-09-02) WITH COVER AND METER READERS LID.
- WATER SERVICE TO BE INSTALLED WITH SOLID COPPER LOCATING WIRE. SEE STANDARD DETAIL 478-7.1 FOR LOCATING WIRE INSTALLATION.
- ON NEW 2" PVC WATER MAINS, A 2" x 1" TAPPING SADDLE (509-05-02-01) AND 1" CORPORATION STOP (509-10-02-01) SHALL BE USED WHEN INSTALLING SERVICE CONNECTIONS.
- ON EXISTING 2" GALVANIZED WATER MAINS, A SERVICE CLAMP (509-09-02-01) AND 1" CORPORATION STOP (509-10-02-02) SHALL BE USED WHEN INSTALLING SERVICE CONNECTIONS.
- ON NEW OR EXISTING WATER MAINS WITH A DIAMETER OF 6" OR LARGER, A 1" TAP SHALL BE MADE INTO THE MAIN AND A 1" CORPORATION STOP (509-10-02-02) SHALL BE USED WHEN INSTALLING SERVICE CONNECTIONS. A SADDLE (509-05-02-01) MAY BE USED IN LIEU OF TAP AS APPROVED BY ENGINEER.
- THE BRASS EXPANSION CONNECTION SUPPLIED WITH THE METER BOX SHALL BE DELIVERED TO THE ENGINEERING INSPECTOR AT THE TIME OF FINAL INSPECTION.
- LONG SERVICES UNDER PAVEMENT REQUIRE 2" CASING OF PVC, HDPE OR STEEL.

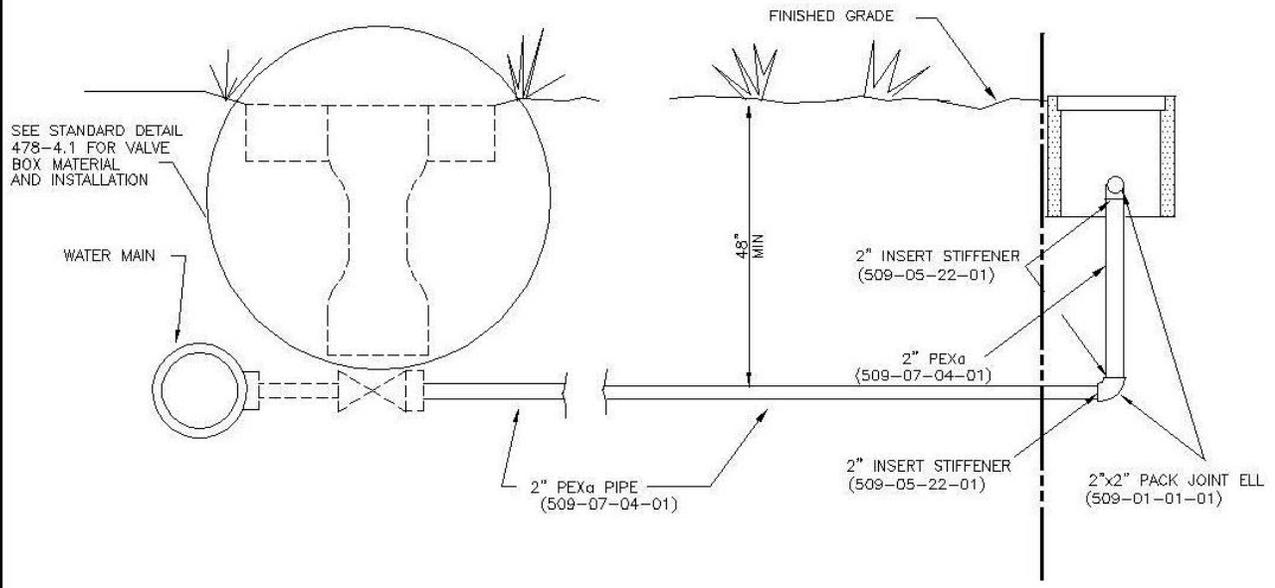
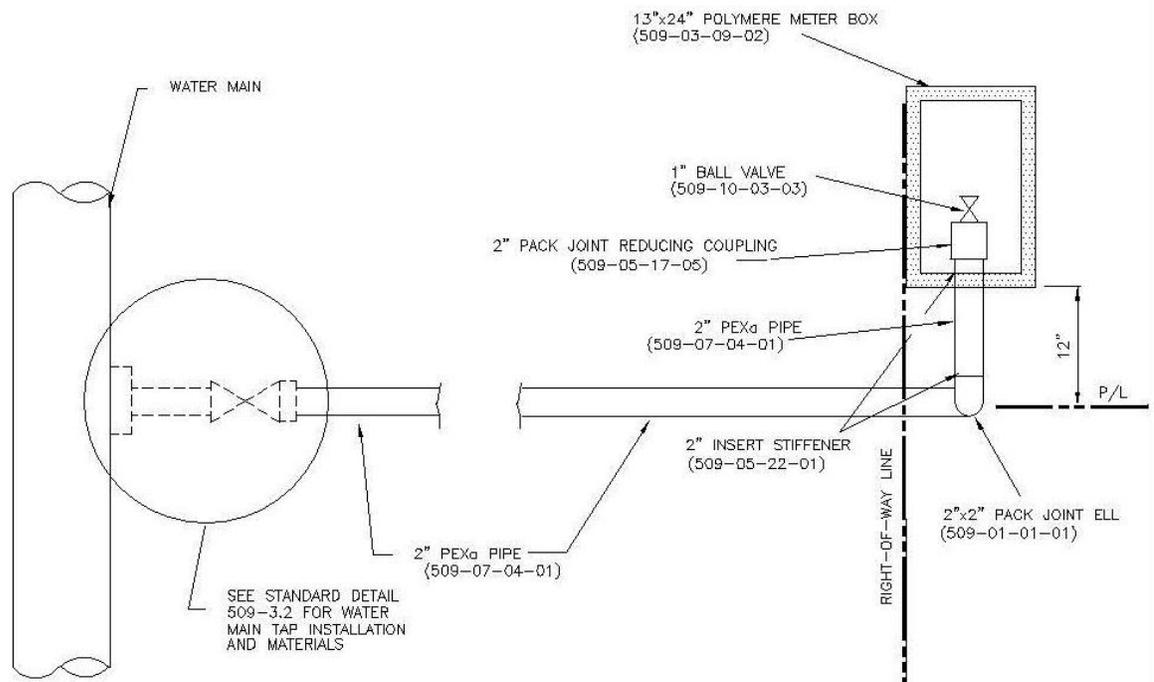
SPECIFICATION		DATE REVISED:	SECTION
			SHT. 1 OF 1
CITY OF VALDOSTA	CITY OF VALDOSTA STANDARD DETAIL	WATER SERVICE SINGLE 3/4" WATER SERVICE	A 508-2.1



**NOTES**

1. METER BOXES SET IN PAVEMENT SHALL BE POLYMER CONCRETE (509-03-09-02) WITH COVER AND METER READERS LID.
2. WATER SERVICE TO BE INSTALLED WITH SOLID COPPER LOCATING WIRE. SEE STANDARD DETAIL 478-7.1 FOR LOCATING WIRE INSTALLATION.
3. ON NEW 2" PVC WATER MAINS, A 2" x 1" TAPPING SADDLE (509-05-02-01) AND 1" CORPORATION STOP (509-10-02-01) SHALL BE USED WHEN INSTALLING SERVICE CONNECTIONS.
4. ON EXISTING 2" GALVANIZED WATER MAINS, A SERVICE CLAMP (509-09-02-01) AND 1" CORPORATION STOP (509-10-02-02) SHALL BE USED WHEN INSTALLING SERVICE CONNECTIONS.
5. ON NEW OR EXISTING WATER MAINS WITH A DIAMETER LARGER THAN 2", A 1" TAP SHALL BE MADE INTO THE MAIN AND A 1" CORPORATION STOP (509-10-02-02) SHALL BE USED WHEN INSTALLING SERVICE CONNECTIONS. A SADDLE (509-05-02-01) MAY BE USED IN LIEU OF TAP AS APPROVED BY THE DIRECTOR OF UTILITIES.
7. LONG SERVICES UNDER PAVEMENT REQUIRE 2" CASING OF PVC, HDPE OR STEEL.

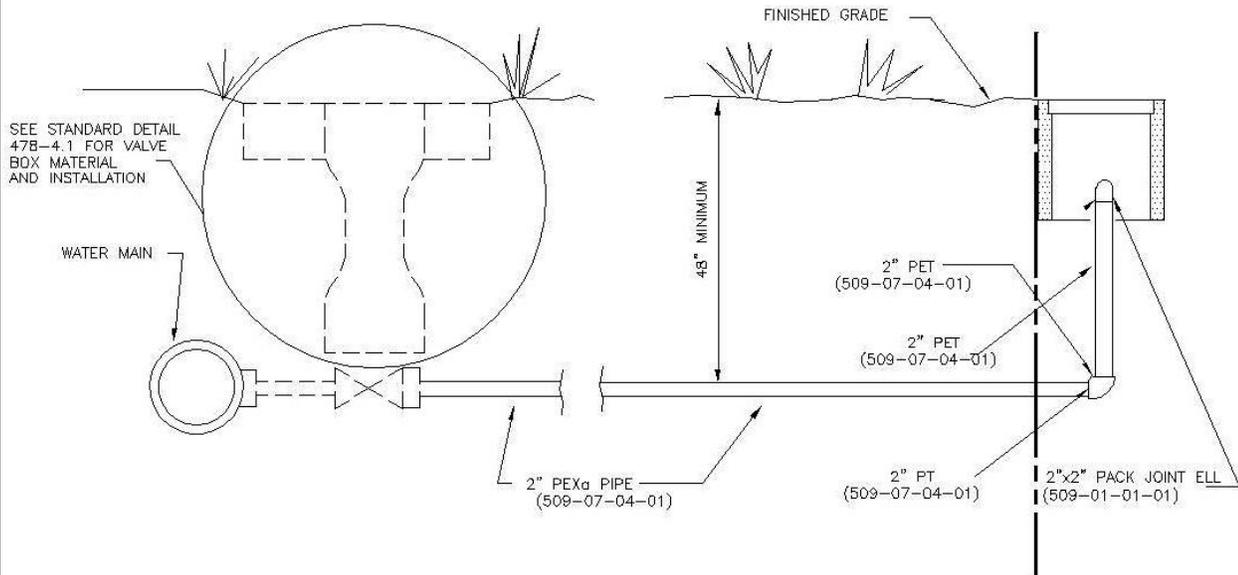
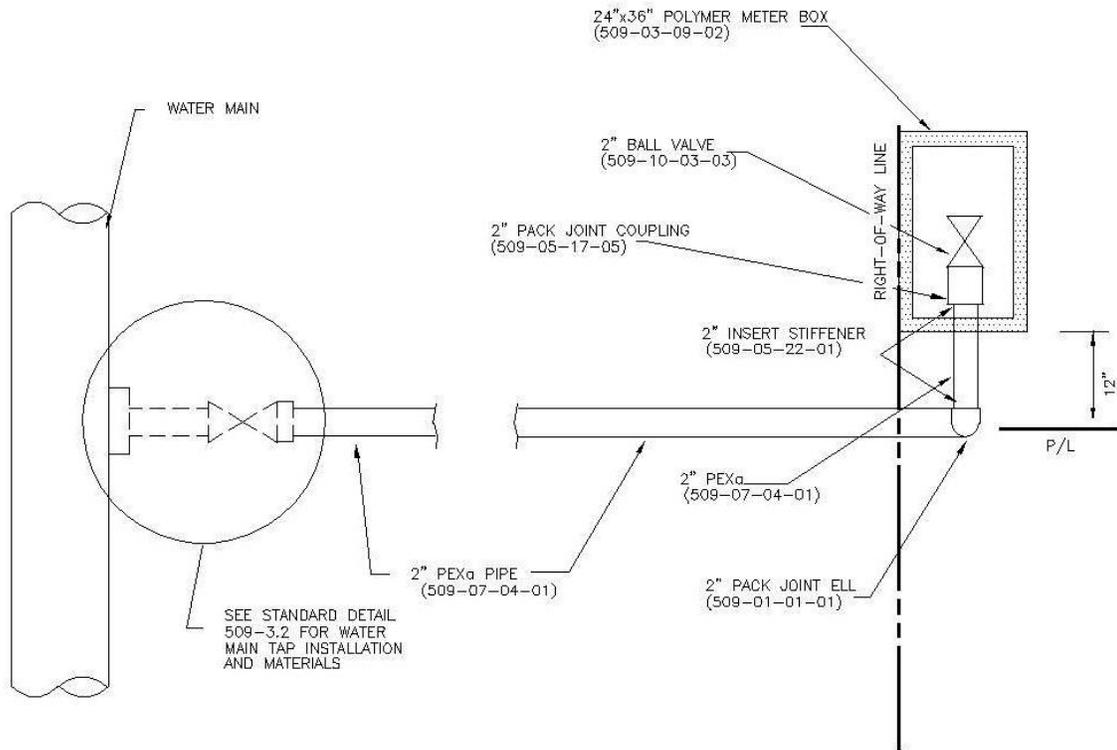
SPECIFICATION						DATE REVISED:		SECTION	
								SHT. 1 OF 1	
CITY OF VALDOSTA		CITY OF VALDOSTA STANDARD DETAIL		WATER SERVICE				C	
				SINGLE 1" WATER SERVICE RESIDENTIAL INSTALLATION				508-2.1	



**NOTES**

1. WATER SERVICE TO BE INSTALLED WITH A SOLID COPPER LOCATING WIRE SEE STANDARD DETAIL 478-7.1 FOR LOCATING WIRE INSTALLATION.
2. LONG SERVICES UNDER PAVEMENT REQUIRE 4" CASING OF PVC, HDPE OR STEEL.

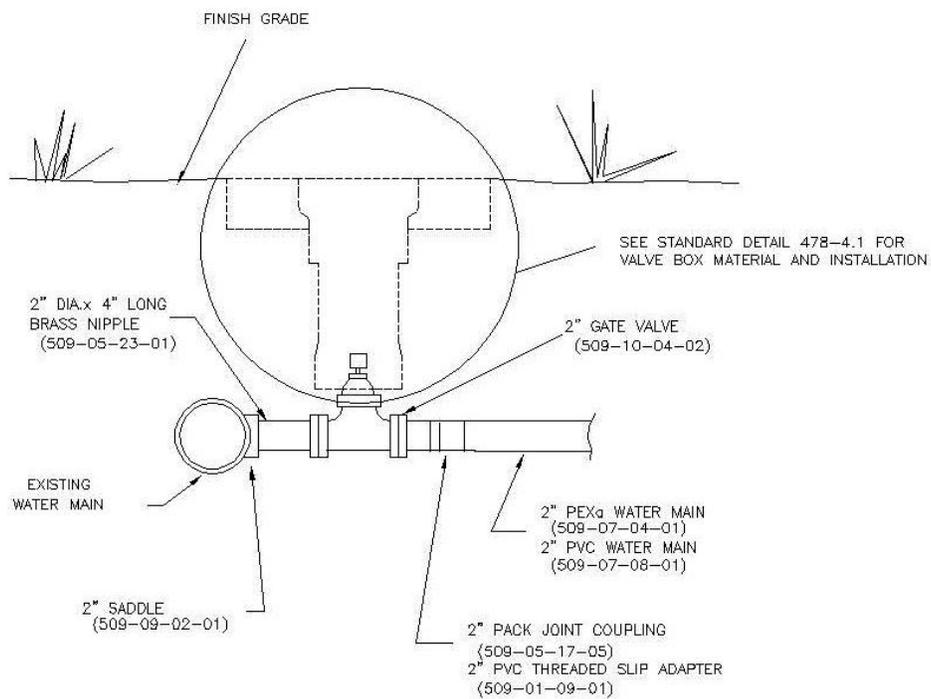
SPECIFICATION		DATE REVISED:	SECTION
CITY OF VALDOSTA	CITY OF VALDOSTA STANDARD DETAIL	WATER SERVICE	SHT. 1 OF 1
SINGLE 1" WATER SERVICE COMMERCIAL INSTALLATION			E
			508-2.1



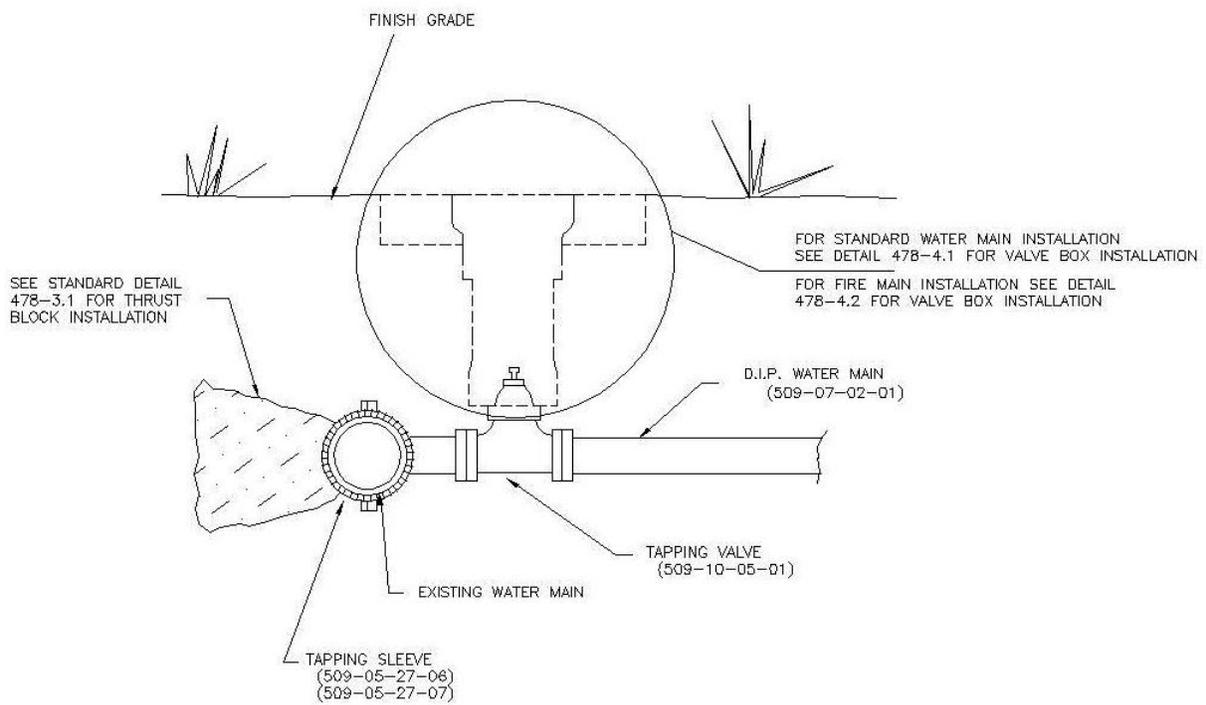
**NOTES**

1. WATER SERVICE TO BE INSTALLED WITH A SOLID COPPER LOCATING WIRE SEE STANDARD DETAIL 478-7.1 FOR LOCATING WIRE INSTALLATION.
2. LONG SERVICES UNDER PAVEMENT REQUIRE 4" CASING OF PVC, HDPE OR STEEL.

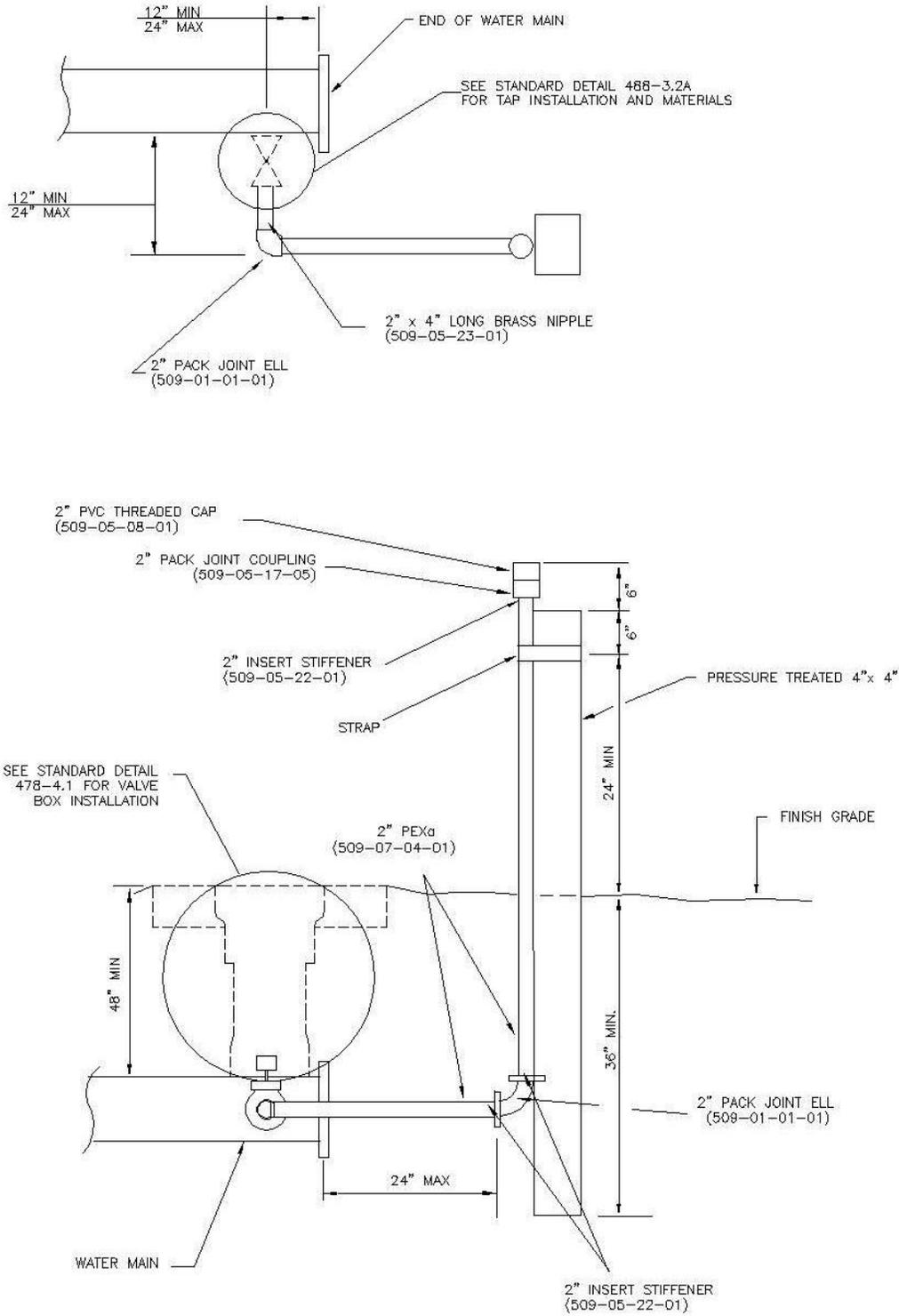
SPECIFICATION		DATE REVISED:	SECTION
			SHT. 1 OF 1
CITY OF VALDOSTA	CITY OF VALDOSTA STANDARD DETAIL	WATER SERVICE SINGLE 1-1/2" & 2" WATER SERVICE	
			G
			508-2.1



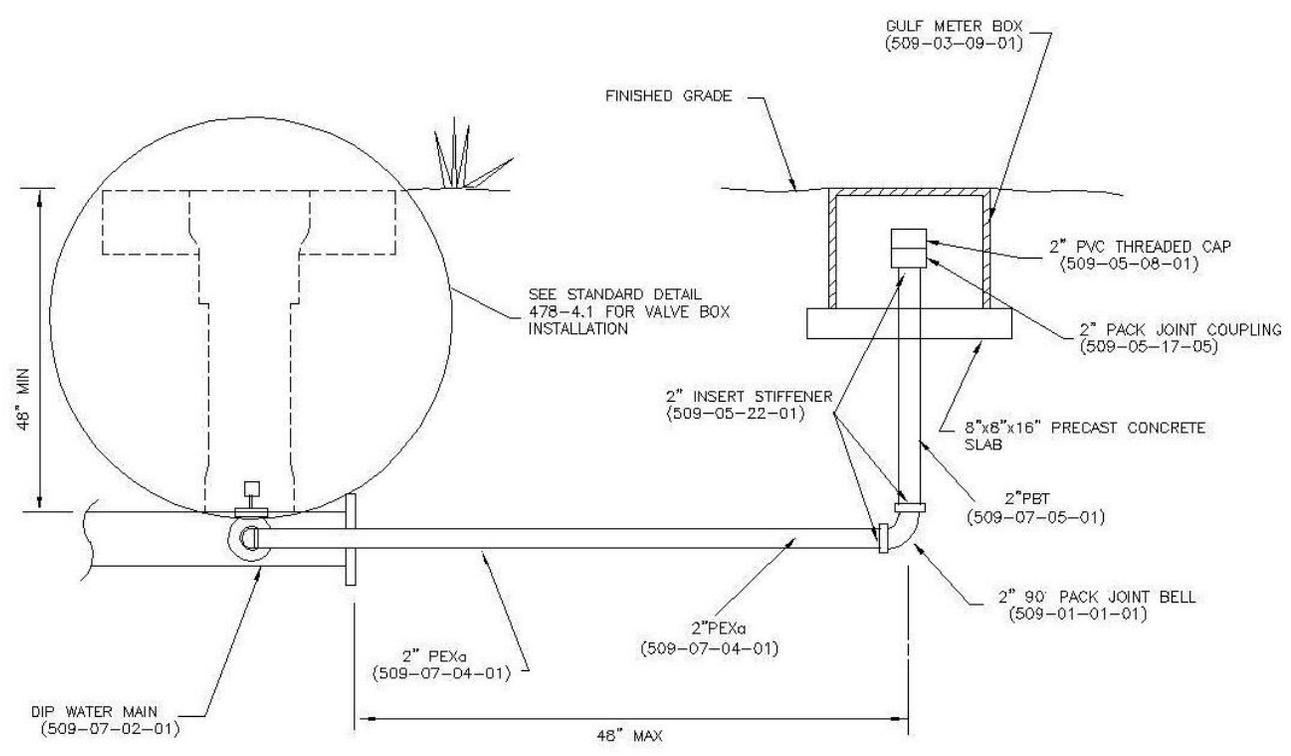
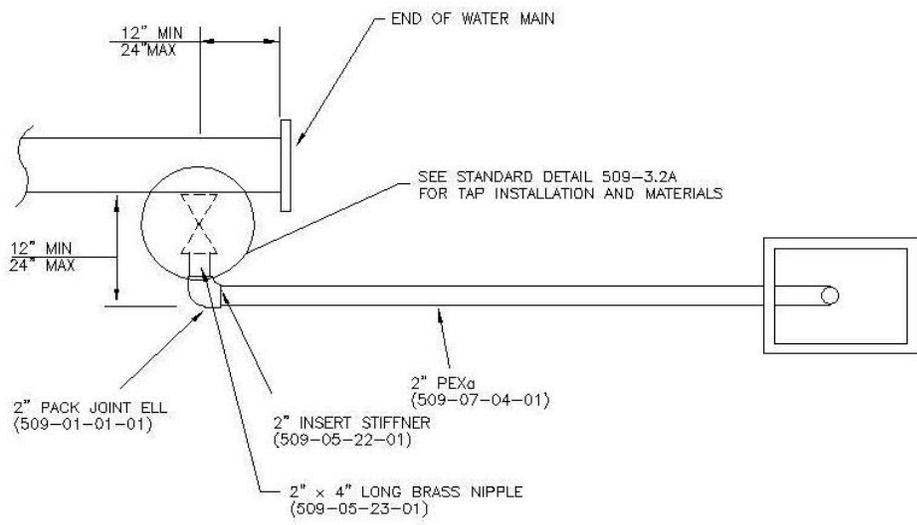
SPECIFICATION										DATE REVISED:					SECTION	
															SHT. 1 OF 1	
CITY OF VALDOSTA		CITY OF VALDOSTA STANDARD DETAIL				WATER MAIN TAP 2" PVC/PET TO EXISTING MAIN								A		
														508-3.2		



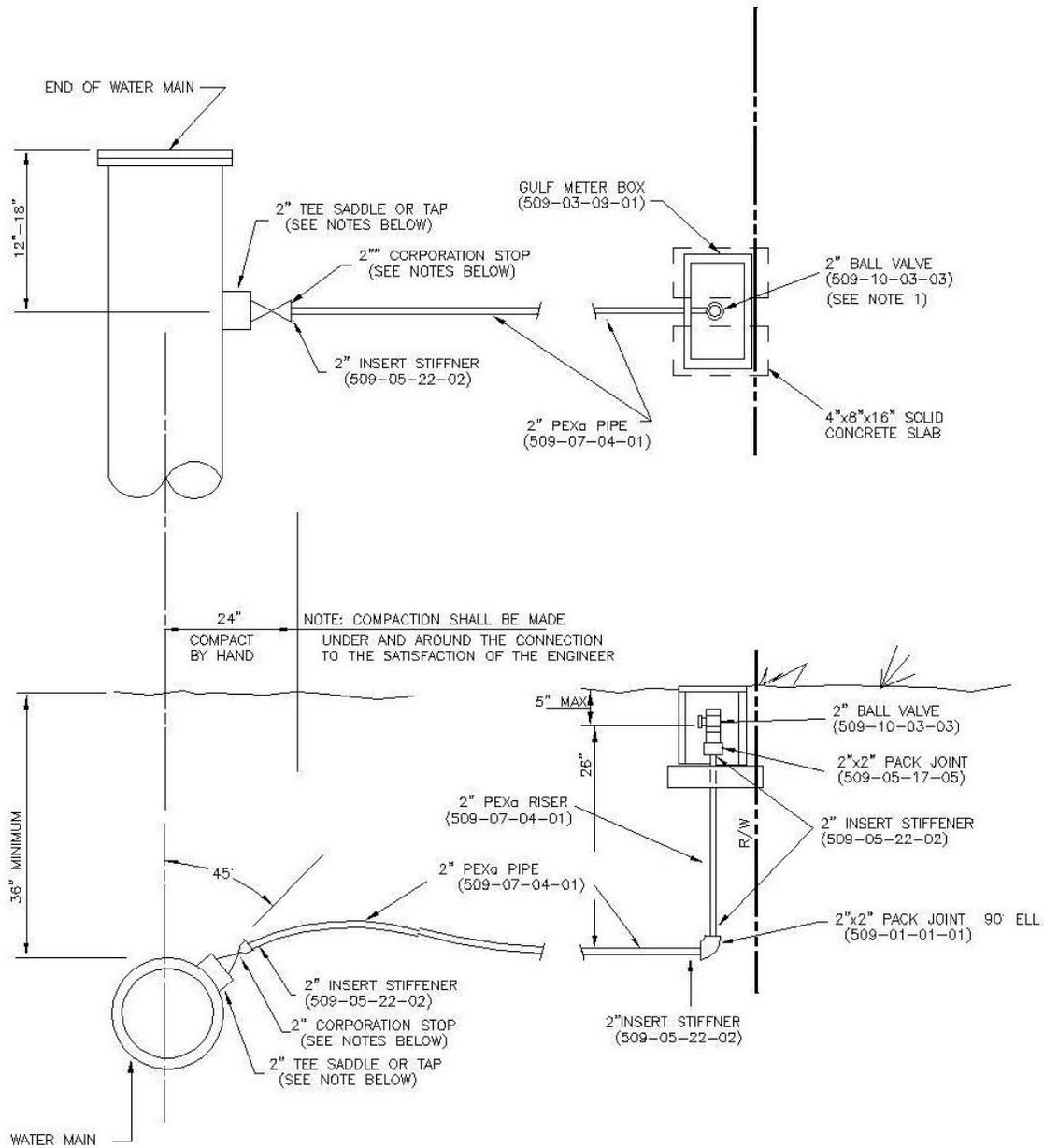
SPECIFICATION										DATE REVISED:										SECTION	
																				SHT. 1 OF 1	
CITY OF VALDOSTA					CITY OF VALDOSTA STANDARD DETAIL					WATER MAIN TAP 3" AND ABOVE										B	
																				508-3.2	



SPECIFICATION										DATE REVISED:					SECTION		
															SHT. 1 OF 1		
CITY OF VALDOSTA					CITY OF VALDOSTA STANDARD DETAIL					TEMPORARY BLOWOFF ASSEMBLY					A		
															508-3.3		



SPECIFICATION										DATE REVISED:					SECTION	
															SHT. 1 OF 1	
CITY OF VALDOSTA			CITY OF VALDOSTA STANDARD DETAIL			PERMANENT BLOWOFF ASSEMBLY					B					
											508-3.3					



**NOTES**

1. BALL TO BE FURNISHED WITH LOCKING DEVICE.
2. POLYETHYLENE PIPE TO BE INSTALLED WITH SOLID COPPER LOCATING WIRE.
3. ON NEW 2" PVC WATER MAINS, A 2" x 2" TAPPING SADDLE (509-05-02-01) , 2" POLYETHYLENE PIPE, 2" CORPORATION STOP (509-10-02-01), AND 1" BALL VALVE SHALL BE USED WHEN INSTALLING BLOWOFF ASSEMBLY.
4. ON NEW OR EXISTING WATER MAINS WITH A DIAMETER LARGER THAN 2", A 2" TAP SHALL BE MADE INTO THE MAIN AND A 2" CORPORATION STOPS (509-10-02-02) SHALL BE USED WHEN INSTALLING BLOWOFF ASSEMBLY. A SADDLE (509-09-02-01) MAY BE USED IN LIEU OF TAP AS APPROVED BY ENGINEER.

SPECIFICATION						DATE REVISED:		SECTION	
								SHT 1 OF 1	
CITY OF VALDOSTA		CITY OF VALDOSTA STANDARD DETAIL		CONSTRUCTION BLOWOFF ASSEMBLY				C	
								508-3.3	

# **DIVISION 500**

## **SECTION 509**

### **RECLAIMED WATER SYSTEM**

#### **STANDARD MATERIALS SPECIFICATIONS**

## **SECTION 509**

### **RECLAIMED WATER SYSTEM STANDARD MATERIALS SPECIFICATIONS**

Following is a list of standard materials to be used in the installation of the reclaimed water main system. Shop drawings are to be submitted. Materials requiring the traditional “Shop Drawing Submittal” are identified by the words “Shop Drawing Required” at the bottom of the specification sheet. All materials must be submitted on Form WSCM001. A copy of Form WSCM001 is provided in the Appendix section of this manual.

The Material Specification Number for each item is located in the upper right hand corner of the specification sheet.

### **LIST OF RECLAIMED WATER MAIN STANDARD MATERIALS**

#### **509-01 ADAPTOR COUPLING**

509-01-01-01	Coupling, Brass Adaptor Elbow
509-01-02-01	Coupling, Brass Adaptor Reducing
509-01-03-01	Coupling, Ductile Iron Pipe
509-01-03-02	Coupling, Ductile Iron Pipe, Restrained
509-01-04-01	Coupling, Brass Adaptor Corporation Elbow
507-01-06-01	Coupling, Repair, Stainless Steel
509-01-09-01	Coupling, PVC Adaptor

#### **509-02 RESERVED**

#### **509-03 BOXES & LIDS**

509-03-03-02	Lid, Gulf Meter Box
509-03-09-01	Box, Gulf Meter
509-03-09-02	Box, Polymer Meter
(See 479-03)	Valve Box

#### **509-04 FIRE ASSEMBLIES**

509-04-01-01	Hydrant, Fire
509-04-99-01	Detector Check Assembly, Single
509-04-99-02	Detector Check Assembly, Double
509-04-99-06	Check Assembly, Double
509-04-99-10	Out of Service Marker

#### **509-05 FITTINGS**

509-05-01-01	Bend, 11 ¼° Ductile Iron, Mechanical Joint
509-05-01-02	Bend, 22 ½° Ductile Iron, Mechanical Joint
509-05-01-03	Bend, 45° Ductile Iron, Mechanical Joint
509-05-01-04	Bend, 90° Ductile Iron, Mechanical Joint
509-05-03-02	Bend, PVC

509-05-06-01	Bushing, Brass
509-05-07-01	Cap, Ductile Iron, Mechanical Joint
509-05-08-01	Cap, Threaded PVC
509-05-17-03	Coupling, Brass
509-05-17-05	Coupling, Pack Joint
509-05-21-01	Elbow, 90°, Brass
509-05-22-02	Insert, Plastic PB
507-05-22-03	Insert, Plastic
509-05-23-01	Nipple, Brass
509-05-25-03	Plug, Solid, Ductile Iron, Mechanical Joint
509-05-25-04	Plug, Tapped, Ductile Iron, Mechanical Joint
509-05-25-05	Plug, Brass
509-05-26-01	Reducer, Ductile Iron, Mechanical Joint
509-05-27-02	Sleeve, Compression
509-05-27-06	Sleeve, Tapping, Steel
509-05-27-07	Sleeve, Tapping, Stainless Steel
509-05-30-01	Tee, Brass Compression Packjoint
509-05-30-02	Tee, Ductile Iron, Mechanical Joint
509-05-30-06	Tee, PVC
509-05-99-01	Bend, 11 ¼° Ductile Iron, Flanged
509-05-99-02	Bend, 22 ½° Ductile Iron, Flanged
509-05-99-03	Bend, 45° Ductile Iron, Flanged
509-05-99-04	Bend, 90° Ductile Iron, Flanged
509-05-99-13	Tee, Ductile Iron, Flanged
509-05-99-20	Restrained Fitting, Mega-Lug, DIP

#### **509-06 METERS**

509-06-01-02	Meter, Reclaimed Water Positive Displacement, Bronze
509-06-01-04	Meter, Turbine Reclaimed Water
509-06-99-01	Meter, Reclaimed Water Compound Type
509-06-99-02	Meter, Propeller

#### **509-07 PIPE**

509-07-02-01	Pipe, Ductile Iron, Pushon
509-07-02-02	Restrained Joint, Ductile Iron Pipe
509-07-03-01	Pipe, Galvanized Steel
509-07-04-01	Pipe, Polyethylene
509-07-05-01	Pipe, HDPE, Fusion
509-07-08-01	Pipe, PVC, Pushon
509-07-08-02	Pipe, PVC, Solvent Weld, Schedule 80
509-07-08-03	Restrained Joint Pipe, PVC
509-07-08-04	Pipe, PVC, Fusion

#### **509-08 RESERVED**

#### **509-09 RESERVED**

**509-10 VALVES**

509-10-01-01	Butterfly Valve, Mechanical Joint
509-10-01-02	Butterfly Valve, Flanged
509-10-02-01	Corporation Stop
509-10-02-02	Corporation Stop, PE
509-10-02-03	Curb Ball Valve
509-10-04-02	Gate Valve, Resilient Seat, Threaded, Bronze Stem
509-10-04-03	Gate Valve, Resilient Seat, NRS, Mechanical Joint, Bronze Stem
509-10-04-04	Gate Valve, Resilient Seat, NRS, Flanged, Bronze Stem
509-10-04-06	Gate Valve, Resilient Seat, Threaded, Stainless Steel Stem
509-10-04-07	Gate Valve, Resilient Seat, NRS, Mechanical Joint, Stainless Steel Stem
509-10-04-08	Gate Valve, Resilient Seat, NRS, Flanged Joint, Stainless Steel Stem
509-10-05-01	Tapping Valve, Resilient Seat, NRS, Mechanical Joint X Flange, Bronze Stem
509-10-05-02	Tapping Valve, Resilient Seat, NRS, Mechanical Joint X Flange, Stainless Steel Stem
509-10-06-01	Air Release Valve
509-10-06-02	Air Release Valve, Plastic

**509-99 RESERVED**

**MATERIAL SPECIFICATION: 509-01-01-01**

**NOMENCLATURE:**

COUPLING, BRASS ADAPTOR ELBOW

**DESCRIPTION:**

To connect polyethylene to polyethylene, shall conform to the latest AWWA specifications C-800 (ASTM B-62). Packjoint nut to have a split clamp with stainless steel screw and grooves inside of clamp for additional gripping action. All couplings shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

<u>MANUFACTURER</u>					
<u>SIZE</u>	<u>BEND</u>	<u>FORD</u>	<u>JONES</u>	<u>MUELLER</u>	<u>A Y MC DONALD</u>
¾"	90°	L-44-33		H-15526	4761-22
1"	90°	L-44-44		H-15526	4761-22
2"	90°	L-44-77	J-2611	H-15526	4761-22

**MATERIAL SPECIFICATION: 509-01-02-01**

NOMENCLATURE:

COUPLING, BRASS ADAPTOR REDUCING

DESCRIPTION:

To connect one inch (1") polyethylene tubing to three quarter inch (3/4") polyethylene tubing. Shall conform to latest AWWA specification C-800 (ASTM B-62). All couplings shall have a minimum pressure rating of 200 psi.

APPROVED MANUFACTURING AND CATALOG NUMBERS

			<u>MANUFACTURER</u>	
<u>SIZE</u>	<u>BEND</u>	<u>FORD</u>	<u>A Y MC DONALD</u>	<u>MUELLER</u>
1" — 3/4"	90°	L-44-34	4761-22	H15526

**MATERIAL SPECIFICATION: 509-01-03-01**

**NOMENCLATURE:**

COUPLING, DUCTILE IRON PIPE

**DESCRIPTION:**

To connect ductile iron pipe ends together. All couplings shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

4" – 24"

HYMAX 2000 Couplings DIP MJ to DIP MJ  
HYMAX 2100 Couplings DIP MJ to DIP Flanged

**MATERIAL SPECIFICATION: 509-01-03-02**

**NOMENCLATURE:**

COUPLING, DUCTILE IRON PIPE, RESTRAINED

**DESCRIPTION:**

To connect ductile iron pipe ends together. All couplings shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

4" – 12"

EBAA IRON MEGA COUPLING, SERIES 3800  
RESTRAINED COUPLING

**MATERIAL SPECIFICATION: 509-01-04-01**

**NOMENCLATURE:**

COUPLING, BRASS ADAPTOR CORPORATION ELBOW

**DESCRIPTION:**

To connect polyethylene to Mueller thread, Mueller thread to iron pipe thread, shall conform to latest AWWA specifications C-800 (ASTM B-62). All couplings shall have a minimum pressure rating of 200 psi.

Inlet: Mueller thread (swivel nut)

Outlet: CTS packjoint

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>BEND</u>	<u>FORD</u>
3/4"	90°	L104-33S
1"	90°	L404-44S

**MATERIAL SPECIFICATION: 509-01-06-01**

**NOMENCLATURE:**

REPAIR COUPLING, STAINLESS STEEL

**DESCRIPTION:**

To repair damaged pipe. All repair couplings shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

4" – 24"

HYMAX EZ-Max Repair Clamp  
Ford- F1 Series  
ROMAC Repair Clamp

**MATERIAL SPECIFICATION: 509-03-03-02**

**NOMENCLATURE:**

LID, GULF METER BOX

**DESCRIPTION:**

Locking type, cast iron, heavy duty, with legend "RECLAIMED WATER METER" on lid.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>TYPE</u>	<u>FORD</u>
7" x 10"	Single Box	

**MATERIAL SPECIFICATION: 509-03-09-01**

**NOMENCLATURE:**

BOX, METER, GULF

**DESCRIPTION:**

To be furnished with locking lid. Lid to be cast with the legend "RECLAIMED WATER METER". Box shall be reclaimed water purple in color if available.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

		<b><u>MANUFACTURER</u></b>	
<b><u>SIZE</u></b>	<b><u>TYPE</u></b>	<b><u>FORD</u></b>	<b><u>MUELLER</u></b>
7 ½" x 11"		G148-233	H-1453-3

**MATERIAL SPECIFICATION: 509-03-09-02**

**NOMENCLATURE:**

BOX, POLYMER METER

**DESCRIPTION:**

Constructed of polymer concrete and reinforced by a heavy weave fiberglass type service box. Logo on cover to read "RECLAIMED WATER METER". Covers shall be non-locking and have hinged reader lid. Color to be purple. Box and cover to have H-10 load rating unless specified otherwise, also to come with mouse holes on both ends. Boxes to have stacking capability.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

<u>SIZE</u>	<u>MANUFACTURER</u>	
	<u>QUAZITE</u>	<u>MID-STATE PLASTICS</u>
13" x 24"	PG1324BB/CA1	MSBC1324-12
17" x 30"		
24" x 36"	PG2436BB/CAP1	MSBC1730-18

**MATERIAL SPECIFICATION: 509-04-01-01**

NOMENCLATURE:

HYDRANT, FIRE

DESCRIPTION:

Shall conform to AWWA C-502 latest specifications, shall contain: two 2 ½” hoses and one 4 ½” steamer connection with National standard fire hose coupling screw threads, 5 ¼” valve opening, 6” diameter mechanical joint inlet, 1 ½” pentagon operating nut and shall open counter clockwise. Hydrants shall be factory painted purple (Tnemec, Safety Purple, CC13, ANSI Z53.1-1971). Refer to 505-2.5.13 for color determination. Bonnet shall be bolted to upper barrel with bonnet bolt & nut. Inside of hydrant shoe to be epoxy coated. Hydrants to have drain holes and be complete with all accessories. All hydrants shall have a minimum pressure rating of 200 psi. All hydrants to have stainless steel stems.

APPROVED MANUFACTURING AND CATALOG NUMBERS

MANUFACTURER

<u>SIZE</u>	<u>M &amp; H</u>	<u>AVK</u>
36”	STYLE 129	2780 SERIES
42”	STYLE 129	2780 SERIES
48”	STYLE 129	2780 SERIES
60”	STYLE 129	2780 SERIES

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-04-99-01**

**NOMENCLATURE:**

CHECK, DETECTOR ASSEMBLY, SINGLE

**DESCRIPTION:**

Shall consist of one internally spring loaded "Y" figure check valve with cast iron body, bronze replaceable seat ring with stainless steel stem and spring. All internal cast iron parts shall be epoxy coated. The bypass assembly shall consist of an internally spring loaded double check valve in series with a water meter which shall read in cubic feet and a shutoff gate valve. Valve shall a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>FEBCO</u>	<u>HERSEY</u>	<u>CONBRACO</u>	<u>AMES</u>
4" x 3/4"		EDC II		1000 DCV
6" x 3/4"		EDC II		1000 DCV
8" x 3/4"		EDC II		1000 DCV
12" x 3/4"		EDC II		1000 DCV

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-04-99-02**

**NOMENCLATURE:**

CHECK, DETECTOR ASSEMBLY, DOUBLE

**DESCRIPTION:**

Shall consist of two internally spring loaded "Y" figure check valves having cast iron bodies, bronze replaceable seat rings and stainless steel stems and springs. All internal cast iron parts shall be epoxy coated. The bypass assembly shall consist of a bronze body internally spring loaded double check valve in series with a bronze water meter which shall read in cubic feet and two gate valves. Valves shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

	<u>MANUFACTURER</u>			
<u>SIZE</u>	<u>FEBCO</u>	<u>HERSEY</u>	<u>AMES</u>	<u>CONBRACO</u>
3" x 3/4"		DDC II		
4" x 3/4"	806YD	DDC II	3000-DCDA	
6" x 3/4"	806YD	DDC II	3000-DCDA	
8" x 3/4"	806YD	DDC II	3000-DCDA	
12" x 3/4"	806YD	DDC II	3000-DCDC	

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-04-99-06**

**NOMENCLATURE:**

CHECK ASSEMBLY, DOUBLE

**DESCRIPTION:**

Shall consist of two internally spring loaded "Y" figure check valves having cast iron bodies, bronze replaceable seat rings and stainless steel stems and springs. All internal cast iron parts shall be epoxy coated. Valve shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

	<u>MANUFACTURER</u>				
<u>SIZE</u>	<u>FEBCO</u>	<u>HERSEY</u>	<u>WATTS</u>	<u>CONBRACO</u>	<u>AMES</u>
3"	805YD	NO. 2	709RW		2000 SS
4"	805YD	NO. 2	709RW		2000 SS
6"	805YD	NO. 2	709RW		2000 SS
8"	805YD	NO. 2	709RW		2000 SS
12"	805YD	NO. 2	709RW		2000 SS

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-04-99-10**

**NONENCLATURE:**

HYDRANT OUT OF SERVICE MARKER

**DESCRIPTION:**

Heavy duty plastic marker installed on hydrant nozzle and stenciled with “OUT OF SERVICE” on one (1) side in bold black paint. Marker to fit four and a half inch (4 ½”) steamer nozzle. Color to be high visibility orange. Must be installed on all new hydrants until flow tested and put in service.

**SIZE**

4 ½”

**MATERIAL SPECIFICATION: 509-05-01-01**

**NOMENCLATURE:**

BEND, 11 ¼°, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

**SIZE      BEND**

6"	11 ¼°
8"	11 ¼°
12"	11 ¼°
16"	11 ¼°
18"	11 ¼°
20"	11 ¼°
24"	11 ¼°
30"	11 ¼°
36"	11 ¼°

**MATERIAL SPECIFICATION: 509-05-01-02**

**NOMENCLATURE:**

BEND, 22 ½°, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

<u>SIZE</u>	<u>BEND</u>
6"	22 ½°
8"	22 ½°
12"	22 ½°
16"	22 ½°
18"	22 ½°
20"	22 ½°
24"	22 ½°
30"	22 ½°
36"	22 ½°

**MATERIAL SPECIFICATION: 509-05-01-03**

**NOMENCLATURE:**

BEND, 45°, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

<u>SIZE</u>	<u>BEND</u>
6"	45°
8"	45°
12"	45°
16"	45°
18"	45°
20"	45°
24"	45°
30"	45°
36"	45°

**MATERIAL SPECIFICATION: 509-05-01-04**

**NOMENCLATURE:**

BEND, 90°, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

<u>SIZE</u>	<u>BEND</u>
6"	90°
8"	90°
12"	90°
16"	90°
18"	90°
20"	90°
24"	90°
30"	90°
36"	90°

**MATERIAL SPECIFICATION: 509-05-03-02**

**NOMENCLATURE:**

BEND, PVC

**DESCRIPTION:**

Shall be pressure rated to 200 psi working pressure and shall conform to ASTM D2466 and ASTM D2467 latest edition. All fittings shall have a minimum pressure rating of 200 psi.

**SIZE**

**TYPE**

2" 45°

SCHEDULE 40

**MATERIAL SPECIFICATION: 509-05-06-01**

**NOMENCLATURE:**

BUSHING, BRASS

**DESCRIPTION:**

Shall have hex head, shall be threaded.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

**TYPE**

2" x 1"

**MATERIAL SPECIFICATION: 509-05-07-01**

**NOMENCLATURE:**

CAP, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All caps shall have a minimum pressure rating of 200 psi.

**SIZE**

6"

8"

12"

16"

18"

20"

24"

30"

36"

**MATERIAL SPECIFICATION: 509-05-08-01**

**NOMENCLATURE:**

CAP, PVC, THREADED

**DESCRIPTION:**

Shall be pressure rated Schedule 80 with female iron pipe threads to 200 psi working pressure and shall conform to ASTM D2464. All caps shall have a minimum pressure rating of 200 psi..

**SIZE**

2"

**MATERIAL SPECIFICATION: 509-05-17-03**

NOMENCLATURE:

COUPLING, BRASS

DESCRIPTION:

Coupling, compression connection for copper tube size polyethylene tubing to male iron pipe threads. All couplings shall have a minimum pressure rating of 200 psi.

APPROVED MANUFACTURING AND CATALOG NUMBERS

MANUFACTURER

<u>SIZE</u>	<u>MUELLER</u>	<u>JONES</u>	<u>FORD</u>	<u>A Y MC DONALD</u>
3/4"	H-15428	J-2605	#C84-33	4758-22
1"	H-15428	J-2605	#C84-44	4758-22
2"	H-15428	J-2605	#C84-77	4758-22

**MATERIAL SPECIFICATION: 509-05-17-05**

NOMENCLATURE:

COUPLING, PACK JOINT

DESCRIPTION:

Coupling, compression connection for copper tube size polyethylene tubing to male iron pipe threads. All couplings shall have a minimum pressure rating of 200 psi.

APPROVED MANUFACTURING AND CATALOG NUMBERS

MANUFACTURER

<u>SIZE</u>	<u>MUELLER</u>	<u>JONES</u>	<u>FORD</u>
3/4"	H-15428	J-2605	#C84-33
1"	H-15428	J-2605	#C84-44
2"	H-15428	J-2605	#C84-77

**MATERIAL SPECIFICATION: 509-05-21-01**

**NOMENCLATURE:**

ELBOW, BRASS REGULAR 90°

**DESCRIPTION:**

Shall have schedule 40 threads, regular elbow brass pipe threads. All fittings shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>BEND</u>
1/2"	90°
3/4"	90°
1"	90°
1 1/4"	90°
1 1/2"	90°
2"	90°
4"	90°

**MATERIAL SPECIFICATION: 509-05-22-02**

NOMENCLATURE:

INSERT, PLASTIC

DESCRIPTION:

For polyethylene tubing, 200 psi minimum pressure rating.

APPROVED MANUFACTURING AND CATALOG NUMBERS

MANUFACTURER

<u>SIZE</u>	<u>MUELLER</u>	<u>MARS</u>	<u>JONES</u>
3/4"			
1"			

**MATERIAL SPECIFICATION: 509-05-23-01**

**NOMENCLATURE:**

NIPPLE, BRASS

**DESCRIPTION:**

Shall have threaded ends. All brass nipples shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

3/4" x 1"  
3/4" x 1 1/2"  
3/4" x 3"  
3/4" x 4"  
3/4" x 6"  
1" x 1 1/2"  
1" x 2"  
1" x 3"  
1" x 4"  
1" x 6"  
1 1/4" x 1 1/2"  
1 1/4" x 2"  
1 1/4" x 3"  
1 1/4" x 4"  
1 1/4" x 6"  
2" x 1 3/4"  
2" x 2"  
2" x 2 1/2"  
2" x 3"  
2" x 4"  
2" x 6"  
4" x 8"

**MATERIAL SPECIFICATION: 509-05-25-03**

**NOMENCLATURE:**

PLUG, SOLID, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All plugs shall have a minimum pressure rating of 200 psi.

**SIZE**

6"  
8"  
12"  
16"  
18"  
20"  
24"  
30"  
36"

**MATERIAL SPECIFICATION: 509-05-25-04**

**NOMENCLATURE:**

PLUG, TAPPED, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with flanged ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All plugs shall have a minimum pressure rating of 200 psi.

<u>SIZE</u>	<u>TAP SIZE</u>
6"	2"
8"	2"
12"	2"
16"	2"
18"	2"
20"	2"
24"	2"
30"	2"
36"	2"

**MATERIAL SPECIFICATION: 509-05-25-05**

**NOMENCLATURE:**

PLUG, BRASS

**DESCRIPTION:**

Shall have threads. All plugs shall have a minimum pressure rating of 200 psi.

**SIZE**

3/4"

1"

2"

**MATERIAL SPECIFICATION: 509-05-26-01**

**NOMENCLATURE:**

REDUCER, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Table WSCM 111 for estimated weights of fittings. All plugs shall have a minimum pressure rating of 200 psi.

**SIZE**

8" x 6"  
12" x 6"  
12" x 8"  
16" x 8"  
16" x 12"  
18" x 8"  
18" x 12"  
18" x 16"  
20" x 8"  
20" x 12"  
20" x 16"  
20" x 16"  
24" x 12"  
24" x 16"  
30" x 16"  
30" x 24"  
36" x 16"  
36" x 24"  
36" x 30"

**MATERIAL SPECIFICATION: 509-05-27-02**

**NOMENCLATURE:**

SLEEVE, COMPRESSION

**DESCRIPTION:**

Shall be galvanized, and shall have a protected gasket. All sleeves shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>SMITH-BLAIR</u>	<u>DRESSER</u>	<u>TELSCO INDUSTRIES</u>	<u>ROMAC</u>
1/2"	522-08400-003	Style #65	700 SERIES	
3/4"	522-10500-003	Style #65	700 SERIES	
1"	522-13200-003	Style #65	700 SERIES	
1 1/4"	522-13200-003	Style #65	700 SERIES	
1 1/2"	522-19000-003	Style #65	700 SERIES	
2"	522-23800-003	Style #65	700 SERIES	

**MATERIAL SPECIFICATION: 509-05-27-06**

**NOMENCLATURE:**

SLEEVE, TAPPING, STEEL

**DESCRIPTION:**

Body: Carbon Steel; flanges: AWWA C207 Class D, ANSI 150 lb. drilling, to have test plug w/3/4" NPT, and recessed cavity for mating tapping valves; Gasket: Grade 60, gasket compounded to use water, oil, salt solutions, mild acids, bases & natural gas. Bolts, washers, and nuts: 18-8 stainless steel type 304. Finish: Fusion bonded epoxy coated to an average of 12 mil thickness inside and out. (AWWA C213-79). Sleeves shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>SMITH-BLAIR</u>	<u>DRESSER</u>	<u>JCM</u>	<u>ROMAC</u>
8" x 6"	622-09050600-031	610-08X06	412-0905X6 ESS	FTS420SSFE
8" x 8"	622-09050800-031	610-08X08	412-0905X8 ESS	FTS420SSFE
10" x 6"	622-11100600-031	610-10X06	412-1110X6 ESS	FTS420SSFE
10" x 8"	622-11100800-031	610-10X08	412-1110X8 ESS	FTS420SSFE
10" x 10"	622-11101000-031	610-10X10	412-1110X10 ESS	FTS420SSFE
12" x 6"	622-13200600-031	610-12X06	412-1320X6 ESS	FTS420SSFE
12" x 8"	622-13200800-031	610-12X08	412-1320X8 ESS	FTS420SSFE
12" x 12"	622-13201200-031	610-12X12	412-1320X12 ESS	FTS420SSFE
16" x 6"	622-17400600-031	610-16X06	412-1740X6 ESS	FTS420SSFE
16" x 8"	622-17400800-031	610-16X08	412-1740X8 ESS	FTS420SSFE
16" x 12"	622-17401200-031	610-16X12	412-1740X12 ESS	FTS420SSFE
16" x 16"	622-17401600-031	610-16X16	412-1740X16 ESS	FTS420SSFE
24" x 6"	622-25800600-031	610-24X06	412-2580X6 ESS	FTS420SSFE
24" x 8"	622-25800800-031	610-24X08	412-2580X8 ESS	FTS420SSFE
24" x 12"	622-25801200-031	610-24X12	412-2580X12 ESS	FTS420SSFE
24" x 16"	622-25801600-031	610-24X16	412-2580X16 ESS	FTS420SSFE
24" x 24"	622-25802400-031	610-24X24	412-2580X24 ESS	FTS420SSFE
36" x 6"	622-36000600-031	610-36X06	412-3600X8 ESS	FTS420SSFE
36" x 8"	622-36000800-031	610-36X08	412-3600X8 ESS	FTS420SSFE
36" x 12"	622-36001200-031	610-36X12	412-3600X12 ESS	FTS420SSFE
36" x 16"	622-36001600-031	610-36X16	412-3600X16 ESS	FTS420SSFE
36" x 24"	622-36002400-031	610-36X24	412-3600X24 ESS	FTS420SSFE
36" x 30"	622-36003000-031	610-36X30	412-3600X30 ESS	FTS420SSFE

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-05-27-07**

**NOMENCLATURE:**

SLEEVE, TAPPING, STAINLESS STEEL

**DESCRIPTION:**

Body: 18-8 stainless steel; Lugs: 18-8 stainless steel; Bolts, washers & nuts: NC rolled thread, 18-8 stainless steel; Gasket: Virgin SBR compounded for water service, full wrap around design. Flange: 18-8 stainless steel, to have ¾" NPT test plug. All sleeves shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

	<u>MANUFACTURER</u>				
<u>SIZE</u>	<u>ROMAC</u>	<u>FORD</u>	<u>JCM</u>	<u>DRESSER</u>	<u>MUELLER</u>
8" x 6"	SST-9.45X6" FLG	Fast-945X6	432-0863X6	630-08X06	H304550945
8" x 8"	SST-9.45X8" FLG	Fast-945X8	432-0863X8	630-08X08	H304550945
10" x 6"	SST-11.45X6" FLG	Fast-1145X6	432-1000X6	630-10X06	H304551145
10" x 8"	SST-11.45X8" FLG	Fast-1145X8	432-1000X8	630-10X08	H304551145
10" x 10"	SST-11.45X10" FLG	Fast-1145X10	432-1000X10	630-10X10	H304551145
12" x 6"	SST-13.56X6" FLG	Fast-1350X6	432-1275X6	630-12X06	H304551356
12" x 8"	SST-13.56X8" FLG	Fast-1350X8	432-1275X8	630-12X08	H304551356
12" x 12"	SST-13.56X12" FLG	Fast-1350X12	432-1275X12	630-12X12	H304551356
16" x 6"	SST-17.80X6" FLG	Fast-1780X6	432-1740X6	630-16X06	H304551780
16" x 8"	SST-17.80X8" FLG	Fast-1780X8	432-1740X8	630-16X08	H304551780
16" x 12"	SST-17.80X12" FLG	Fast-1780X12	432-1740X12	630-16X12	H304551780
16" x 16"	SST-17.80X16" FLG	Fast-1780X16	432-1740X16	630-16X16	H304551780
24" x 6"	SST-26.00X6" FLG	Fast-2380X6	432-2360X6	630-24X06	H304552410
24" x 8"	SST-26.00X8" FLG	Fast-2380X8	432-2360X8	630-24X08	H304552410
24" x 12"	SST-26.00X12" FLG	Fast-2380X12	432-2360X12	630-24X12	H304552410
24" x 16"	SST-26.00X16" FLG	Fast-2380X16	432-2360X16	630-24X16	H304552410
24" x 24"	SST-26.00X24" FLG	Fast-2380X24	432-2360X24	630-24X24	H304552410
36" x 6"	SST-38.00X6" FLG	Fast-3780X6		630-36X06	
36" x 8"	SST-38.00X8" FLG	Fast-3780X8		630-36X08	
36" x 12"	SST-38.00X12" FLG	Fast-3780X12		630-36X12	
36" x 16"	SST-38.00X16" FLG	Fast-3780X16		630-36X16	
36" x 24"	SST-38.00X24" FLG	Fast-3780X24		630-36X24	
36" x 30"	SST-38.00X30" FLG	Fast-3780X30		630-36X30	

**MATERIAL SPECIFICATION: 509-05-30-01**

**NOMENCLATURE:**

TEE, BRASS COMPRESSION PACKJOINT

**DESCRIPTION:**

To connect polyethylene to polyethylene. Shall conform to AWWA specification C-800 (ASTM B-62). Packjoint nut to have a split clamp with stainless steel screw and grooves inside of clamp for additional gripping action. Tee shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

	<u>MANUFACTURER</u>			
<u>SIZE</u>	<u>FORD</u>	<u>MUELLER</u>	<u>JONES</u>	<u>A Y MC DONALD</u>
¾" x ¾" x 1"	T444-334	H-15381	J-2617	4760-22
2" x 2" x 2"	T444-777			

**MATERIAL SPECIFICATION: 509-05-30-02**

**NOMENCLATURE:**

TEE, DUCTILE IRON, MECHANICAL JOINT

**DESCRIPTION:**

Shall be ductile iron fitting with mechanical joint ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-153 latest for compact fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Tables WSCM 110 and 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

**SIZE**

- 6" x 6"
- 8" x 6"
- 8" x 8"
- 12" x 6"
- 12" x 8"
- 12" x 12"
- 16" x 8"
- 16" x 12"
- 16" x 16"
- 18" x 6"
- 18" x 8"
- 18" x 12"
- 18" x 18"
- 20" x 6"
- 20" x 8"
- 20" x 12"
- 20" x 20"
- 24" X 6"
- 24" X 8"
- 24" x 12"
- 24" x 16"
- 24" x 18"
- 24" x 24"

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**MATERIAL SPECIFICATION: 509-05-30-02**

**SIZE**

30" x 6"

30" x 8"

30" x 12"

30" x 16"

30" x 24"

30" x 30"

36" x 8"

36" x 12"

36" x 16"

36" x 24"

36" x 30"

36" x 36"

**MATERIAL SPECIFICATION: 509-05-30-06**

**NOMENCLATURE:**

TEE, PVC, SCHEDULE 40

**DESCRIPTION:**

To be pressure rated at 200 psi, Schedule 40 PVC, and conform to ASTM D2466 and ASTM D2467.

**SIZE**

2" x 2" x 1"

2" x 2" x 2"

**MATERIAL SPECIFICATION: 509-05-99-01**

**NOMENCLATURE:**

BEND, 11 ¼°, DUCTILE IRON, FLANGED

**DESCRIPTION:**

Shall be ductile iron fitting with flanged ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-110 latest for standard fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Table WSCM 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

<u>SIZE</u>	<u>BEND</u>
6"	11 ¼°
8"	11 ¼°
12"	11 ¼°
16"	11 ¼°
18"	11 ¼°
20"	11 ¼°
24"	11 ¼°
30"	11 ¼°
36"	11 ¼°

**MATERIAL SPECIFICATION: 509-05-99-02**

**NOMENCLATURE:**

BEND, 22 1/2°, DUCTILE IRON, FLANGED

**DESCRIPTION:**

Shall be ductile iron fitting with flanged ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-110 latest for standard fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Table WSCM 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

<u>SIZE</u>	<u>BEND</u>
6"	22 1/2°
8"	22 1/2°
12"	22 1/2°
16"	22 1/2°
18"	22 1/2°
20"	22 1/2°
24"	22 1/2°
30"	22 1/2°
36"	22 1/2°

**MATERIAL SPECIFICATION: 509-05-99-03**

**NOMENCLATURE:**

BEND, 45°, DUCTILE IRON, FLANGED

**DESCRIPTION:**

Shall be ductile iron fitting with flanged ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-110 latest for standard fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Table WSCM 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

**SIZE    BEND**

6"	45°
8"	45°
12"	45°
16"	45°
18"	45°
20"	45°
24"	45°
30"	45°
36"	45°

**MATERIAL SPECIFICATION: 509-05-99-04**

**NOMENCLATURE:**

BEND, 90°, DUCTILE IRON, FLANGED

**DESCRIPTION:**

Shall be ductile iron fitting with flanged ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-110 latest for standard fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Table WSCM 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

**SIZE    BEND**

6"	90°
8"	90°
12"	90°
16"	90°
18"	90°
20"	90°
24"	90°
30"	90°
36"	90°

**MATERIAL SPECIFICATION: 509-05-99-13**

**NOMENCLATURE:**

TEE, DUCTILE IRON, FLANGED

**DESCRIPTION:**

Shall be ductile iron fitting with flanged ends, shall be cement mortar lined and bituminous sealed, shall conform to ANSI/AWWA C-110 latest for standard fittings three inch (3") through 36". All fittings to be furnished with accessories. Refer to Table WSCM 111 for estimated weights of fittings. All fittings shall have a minimum pressure rating of 200 psi.

**SIZE**

6" x 6"  
8" x 6"  
8" x 8"  
12" x 6"  
12" x 8"  
12" x 12"  
16" x 6"  
16" x 8"  
16" x 12"  
16" X 16"  
24" X 6"  
24" X 8"  
24" x 12"  
24" x 16"  
24" x 24"  
30" x 6"  
30" x 8"  
30" x 12"  
30" x 16"  
30" x 24"  
30" x 30"  
36" x 8"  
36" x 12"  
36" x 16"  
36" x 24"  
36" x 30"  
36" x 36"

**MATERIAL SPECIFICATION: 509-05-99-20**

**NOMENCLATURE:**

RESTRAINED FITTING, MEGA-LUG, DIP

**DESCRIPTION:**

Shall be ductile iron conforming to ANSI/AWWA C151/A21.51. All restrained mega-lugs shall be furnished with accessories and have a minimum pressure resistance of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

4"- 48"	EBAA IRON – SERIES 1100
4"- 48"	SIGMA-ONE LOK SERIES SLD

**MATERIAL SPECIFICATION: 509-06-01-02**

**NOMENCLATURE:**

METER, RECLAIMED WATER POSITIVE DISPLACEMENT BRONZE

**DESCRIPTION:**

This specification covers cold reclaimed water meter - positive displacement type, sizes  $\frac{5}{8}$ " x  $\frac{3}{4}$ ", 1" x 1", 1  $\frac{1}{2}$ " x 1  $\frac{1}{2}$ " and 2" x 2". The reclaimed water meters to be furnished will equal or exceed the requirements of AWWA C-700-95-latest revision with particular reference to flow capacity, pressure loss, accuracy, physical dimension, and material construction.

**AFFIDAVIT OF COMPLIANCE:** A copy of the compliance from the manufacturer must be submitted and shall certify that the meters bid will be furnished in full compliance with the requirements of this specification and those of AWWA C-700-77-latest revision.

**INSPECTION AND TEST:** The successful bidder shall supply actual test results for each and every water meter by meter serial number for each shipment of meters, and shall be responsible for delivery of all meters in first class condition.

**MAINCASE:** Shall be of high grade bronze containing not less than 75% copper and withstand a working pressure test of 200 psi without leakage at gasket. Size, model, and direction of flow shall be marked permanently on outer case of all meters. The name of the manufacturer shall be marked permanently on the lid of the register box. The serial number of the meter shall be imprinted on the lid and on meter main case.

**REGISTRATION:** The register shall be permanently hermetically sealed. Magnetic drive, low torque registration, straight reading, cubic foot, large numerals, tempered glass lens, no fogging, low flow indicator.

**CONNECTION:** Shall be flanged and/or screwed ends as designated. If flanged, shall come with companion flanges, gaskets, bolts and nuts.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>NUMBER</u>	<u>SIZE</u>	<u>SENSUS</u>
06-02-0058	$\frac{5}{8}$ " x $\frac{3}{4}$ "	SR II
06-02-0100	1" x 1"	SR II
06-02-0150	1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ "	SR
06-02-0200	2" x 2"	SR

**MATERIAL SPECIFICATION: 509-06-01-04**

**NOMENCLATURE:**

METER, RECLAIMED WATER TURBINE

**DESCRIPTION:**

This specification covers cold reclaimed water meters - turbine type, sizes 1 ½", 2", 3", 4", and 6". The reclaimed water meters to be furnished shall be Class II, horizontal shaft and equal or exceed the requirements of AWWA C-701-latest revisions with particular reference to flow capacity, pressure loss, accuracy, physical dimension and material construction.

**AFFIDAVIT OF COMPLIANCE:** A copy of the affidavit of compliance from the manufacturer must be submitted and shall certify that the meters bid will be furnished in full compliance with the requirements of this specification and those of AWWA C-701-latest revision.

**INSPECTION AND TEST:** The successful bidder shall supply actual test results for each and every water meter by meter serial number for each shipment of meters, and shall be responsible for delivery of all meters in first class condition.

**MAINCASE:** Shall be of high grade bronze containing not less than 75% copper and with operating pressure test of 200 psi without leakage at gasket. Size, model, and direction of flow shall be marked permanently on outer case of all meters. The name of the manufacturer shall be marked permanently on the lid of the register box. The serial number of the meter shall be imprinted on the lid and on meter main case.

**STRAINER:** Turbine meter must be able to use strainer without the additional piping up stream and down stream to control accuracy of the meter. Strainer to come with meter only upon request.

**REGISTRATION:** The register shall be permanently hermetically sealed, magnetic drive, low torque registration, straight reading, cubic foot, large numerals, and no fogging type lens.

**CONNECTION:** Shall be flanged and shall come with companion flanges, gaskets, bolts, and nuts.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

**SENSUS**

1 ½"	"W" TURBO
2"	"W" TURBO
3"	"W" TURBO
4"	"W" TURBO
6"	"W" TURBO

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-06-99-01**

**NOMENCLATURE:**

METER, RECLAIMED WATER COMPOUND TYPE

**DESCRIPTION:**

This specification covers compound type reclaimed water meters, sizes two inch (2") through six inch (6"). The meters to be furnished will equal or exceed the requirements of AWWA C-702-latest revision with particular reference to flow capacity, pressure loss, accuracy, physical dimension and material construction.

**AFFIDAVIT OF COMPLIANCE:** A copy of the affidavit of compliance from the manufacturer must be submitted and shall certify that the meters bid will be furnished in full compliance with the requirements of this specification and those of AWWA C-702-latest revision.

**INSPECTION AND TEST:** The successful bidder shall supply actual test results for each and every reclaimed water meter by meter serial number for each shipment of meters, and shall be responsible for delivery of all meters in first class condition.

**MAINCASE:** Shall be of high grade bronze containing not less than 75% copper and withstand a working pressure of 200 psi without leakage or damage to any parts. The size, model, and direction of flow shall be marked permanently on outer case of all meters. The name of the manufacturer shall be marked permanently on the lid of the register box. The serial number of the meter shall be imprinted on the lid and on the meter main case.

**REGISTRATION:** The register shall be permanently hermetically sealed, magnetic drive, low torque registration, straight reading, cubic foot, low flow indicator.

**STRAINER:** Compound meter must be able to use strainer without the additional piping up stream and down stream to control accuracy of the meter. Strainer to come with meter only upon request.

**CONNECTION:** Shall be flanged, and come with companion flanges, gaskets, bolts, and nuts.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>SENSUS</u>
2"	SRH
3"	SRH
4"	SRH
6"	SRH

**MATERIAL SPECIFICATION: 509-06-99-02**

**NOMENCLATURE:**

METER, PROPELLER FLOWMETERS

**DESCRIPTION:**

This specification covers propeller flow meters sizes eight inch (8") through 24". The meters to be furnished will equal or exceed the requirements of AWWA C-704, latest revision.

**AFFIDAVIT OF COMPLIANCE:** A copy of the affidavit of compliance from the manufacturer must be submitted and shall certify that the meters will be furnished in full compliance with these requirements.

**MAINCASE:** Shall be made of bronze, cast iron or stainless steel with a working pressure of 200 psi without leakage or damage to any parts.

**REGISTER:** Register shall be sealed, magnetic drive, hinged cover with locking hasp, cubic foot reading, 4-20 amp output for remote readings.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**MC CROMETER**

**MATERIAL SPECIFICATION: 509-07-02-01**

**NOMENCLATURE:**

PIPE, DUCTILE IRON, PUSHON, CEMENT LINED

**DESCRIPTION:**

Pipe shall be ductile iron conforming to the latest requirements of ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51, Pressure Class, rated for a minimum 200 psi working pressure (or project requirements, whichever is greater) plus a 100 psi minimum surge allowance and a 2 to 1 factor of safety, using a Type II laying condition and a depth of cover of four (4) feet. Ductile iron pipe shall be manufactured in the U.S.A. and each piece shall be subjected to a hydrostatic pressure test of at least 500 psi at the point of manufacture. Pipe diameters 4" through 12" shall be class 350 minimum, diameters 14" through 20" shall be class 250 minimum and pipe diameters 24" and larger shall be class 200 minimum. Pipe shall have an exterior bituminous coating applied by airless spray method. Pipe shall have an interior cement mortar lining applied in accordance with ANSI/AWWA C104/A21.4, latest revision. All pipe shall be furnished with Push-On type joints. Joints shall be in accordance with ANSI/AWWA C111/A21.11, latest revision, and be furnished complete with all necessary accessories. The class or nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, country where cast, year in which the pipe was produced, and the letters, "DI" or "Ductile" shall be cast or stamped on each length of pipe. Pipes with cracked or chipped linings or defective pipes will be rejected.

<u>SIZE</u>	<u>CLASS</u>
6"	350
8"	350
10"	350
12"	350
14"	250
16"	250
18"	250
20"	250
24"	200
30"	200
36"	200

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-07-02-02**

**NOMENCLATURE:**

RESTRAINED JOINT PIPE, DUCTILE IRON

**DESCRIPTION:**

Joint shall be restrained using grip gaskets or lock-rings as described below.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>AMERICAN</u></b>	Ductile Iron Pipe, Fast-Grip Restrained Gaskets, Lok-Ring restrained rings.
<b><u>MC WANE</u></b>	Ductile Iron Pipe, Field Lok Restrained Gaskets, Field-Lock restrained rings.
<b><u>GRIFFIN</u></b>	Ductile Iron Pipe, Field Lok Restrained Gaskets, Snap-Lok restrained rings.
<b><u>U. S.</u></b>	Ductile Iron Pipe, Field Lok Restrained Gaskets, Field-Lok restrained rings.
<b><u>EBAA IRON</u></b>	Ductile Iron Pipe, Mega-lug Restraint Harness, Series 1700

**MATERIAL SPECIFICATION: 509-07-03-01**

**NOMENCLATURE:**

PIPE, GALVANIZED STEEL

**DESCRIPTION:**

Shall be Schedule 40, threaded ends, fitted with one coupling per joint, and conform to ASTM specifications (A120-72). Pipe shall have a minimum pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**SIZE**

3/4"

1"

1 1/4"

1 1/2"

2"

**MATERIAL SPECIFICATION: 509-07-04-01**

**NOMENCLATURE:**

PIPE, POLYETHELENE

**DESCRIPTION:**

Shall have a minimum pressure rating of 200 psi. Shall conform to ASTM specifications D-2737, PE 3408, copper tube size outside diameter, and shall conform to AWWA C-901 latest, color purple.

**SIZE**

3/4"

1"

2"

**MATERIAL SPECIFICATION: 509-07-05-01**

**NOMENCLATURE:**

PIPE, HDPE, FUSION

**DESCRIPTION:**

HDPE directional bored pressure pipe shall conform to C906 AWWA latest edition with a DR-11, 160 psi or DR-9, 200 psi pressure rating, with color coded purple striping.

**SIZE**

4"	C906
6"	C906
8"	C906
10"	C906
12"	C906
18"	C906
20"	C906
24"	C906
30"	C906
36"	C906

**MATERIAL SPECIFICATION: 509-07-08-01**

**NOMENCLATURE:**

PIPE, PVC, PUSHON

**DESCRIPTION:**

PVC pressure pipe shall conform to C-900/C-905 AWWA latest edition with a 200 psi pressure rating DR-18 or DR-14, color purple, gasketed bell joint.

The manufacturer must supply a certificate of application that the pipe has met requirements of C-900/C-905 AWWA latest edition.

**SIZE**

4"	C900PVC
6"	C900PVC
8"	C900PVC
10"	C900PVC
12"	C900PVC
16"	C905PVC
18"	C905PVC
20"	C905PVC
24"	C905PVC
30"	C905PVC
36"	C905PVC

**MATERIAL SPECIFICATION: 509-07-08-02**

**NOMENCLATURE:**

PIPE, PVC, SOLVENT WELD, SCH 40

**DESCRIPTION:**

Schedule 40 PVC pressure pipe conforming to ASTM D-1785, 200 psi pressure rating, color purple.

**SIZE**

3/4"

1"

2"

**MATERIAL SPECIFICATION: 509-07-08-03**

**NOMENCLATURE:**

RESTRAINED JOINT PIPE, PVC

**DESCRIPTION:**

Joint shall be restrained using Certa-Lok C900 restrained joint PVC piping system or Bell Restraint Harnesses.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

**CERTAIN TEED**

Certa-Lok C900/RJ Restrained Joint, Mechanical Gland  
Adapters for DR14 and DR18 pipe

**EBAA IRON**

Bell Restraint Harness for C900 PVC Pipe, Series 1600 for  
DR14 and DR18 pipe

**MATERIAL SPECIFICATION: 509-07-08-04**

**NOMENCLATURE:**

PIPE, PVC, FUSION

**DESCRIPTION:**

PVC directional bored pressure pipe shall conform to C-900 and C-905 AWWA latest edition with a DR-18, 200 psi pressure rating, color purple

**SIZE**

4"	C900
6"	C900
8"	C900
10"	C900
12"	C900
16"	C905
18"	C905
20"	C905
24"	C905
30"	C905
36"	C905

**MATERIAL SPECIFICATION: 509-10-01-01**

**NOMENCLATURE:**

BUTTERFLY VALVE, MECHANICAL JOINT

**DESCRIPTION:**

AWWA butterfly valve neoprene seated. Shall conform to AWWA C504 latest revision. Shall have a pressure rating of 175 psi working pressure. Standard mechanical joint, cast iron and dimension shall comply with AWWA C-111 and shall contain two inch (2") square operating nut, open counter clockwise, be epoxy coated on inside, tar coating on outside and be complete with accessories. Neoprene seat can be on disc or body.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>MUELLER</u>	<u>DE ZURIK</u>	<u>PRATT</u>	<u>M &amp; H/CLOW</u>
12"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
14"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
16"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
18"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
20"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
24"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
30"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500
36"	B3211-20	CLASS 200 MJ	GROUND HOG	STYLE 4500

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-01-02**

**NOMENCLATURE:**

BUTTERFLY VALVE, FLANGED

**DESCRIPTION:**

AWWA butterfly valve shall conform to AWWA C504, latest revision. Shall have pressure rating of 175 psi working pressure with flanged ends, short body type. Valves shall have ASTM A126, Class B cast iron body with 125-pound full faced flanges drilled in accordance with ANSI B16.1. Valves shall have wheel handles, open counter clockwise, be epoxy coated inside and out and be complete with accessories. Neoprene seat can be attached to body or the disc.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>MUELLER</u>	<u>DE ZURIK</u>	<u>PRATT</u>	<u>M &amp; H</u>
12"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
14"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
16"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
18"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
20"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
24"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
30"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500
36"	B3211-20	CLASS 200MJ	GROUND HOG	STYLE 4500

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-02-01**

**NOMENCLATURE:**

STOP, CORPORATION

**DESCRIPTION:**

Corporation stop standard IP thread inlet, with outlet copper tube size packjoint - for polyethylene, shall meet AWWA specification C-800 (ASTM B-62). Packjoint nut to have a split clamp with stainless steel screw and grooves inside of clamp for additional gripping action. Corporation stop shall have a pressure rating of 200 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>FORD</u>	<u>MUELLER</u>
1" x 1"	F-1100	H-15028
2" X 2"	F-1100	H-15028

**MATERIAL SPECIFICATION: 509-10-02-02**

**NOMENCLATURE:**

STOP, CORPORATION, PE

**DESCRIPTION:**

Corporation stop standard CC thread inlet with outlet copper tube size packjoint - for polyethylene, shall meet AWWA specification C-800 (ASTM B-62). Packjoint nut to have a split clamp with stainless steel screw and grooves inside of clamp for additional gripping action. Corporation stop shall have a pressure rating of 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>FORD</u></b>	<b><u>MUELLER</u></b>
3/4"	F-1000	H-15008
1"	F-1000	H-15008

**MATERIAL SPECIFICATION: 509-10-02-03**

**NOMENCLATURE:**

CURB BALL VALVE

**DESCRIPTION:**

Inlet and outlet female iron pipe thread, tee head winglock. Shall meet AWWA specification C-800 (ASTM B-62). Shall be full port opening through valve throat. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>FORD</u></b>	<b><u>MUELLER</u></b>
¾"	B 11-333W	B 20200
1"	B 11-444W	B 20200
2"	B 11-777W	B 20200

**MATERIAL SPECIFICATION: 509-10-04-02**

**NOMENCLATURE:**

GATE VALVE, RESILIENT SEAT, THREADED, BRONZE STEM

**DESCRIPTION:**

Shall contain two inch (2") square operating nut, open counter clockwise, conform to AWWA C-509 latest, be epoxy coated on inside, tar coating on outside, have threaded ends, cast iron body o-ring type stem and non-rising bronze stem. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>AMERICAN FLOW CONTROL</u></b>	<b><u>M &amp; H</u></b>	<b><u>AVK</u></b>
2"	SERIES 500	STYLE 4067-07	SERIES 03

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-04-03**

**NOMENCLATURE:**

GATE VALVE, RESILIENT SEAT, N.R.S., MECHANICAL JOINT, BRONZE STEM

**DESCRIPTION:**

Shall contain two inch (2") square operating nut, open counter clockwise, conform to AWWA C-509 latest and shall be epoxy coated on inside, tar coating on outside. Shall have mechanical joint ends and come with accessories. Shall have ductile iron body, o-ring type stem and non rising bronze stem. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

	<u>MANUFACTURER</u>	
<u>SIZE</u>	<u>M &amp; H</u>	<u>AVK</u>
2"	STYLE 4067-01	SERIES 25
4"	STYLE 4067-01	SERIES 25
6"	STYLE 4067-01	SERIES 25
8"	STYLE 4067-01	SERIES 25
10"	STYLE 4067-01	SERIES 25

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-04-04**

**NOMENCLATURE:**

GATE VALVE, RESILIENT SEAT, N.R.S., FLANGED JOINT, BRONZE STEM

**DESCRIPTION:**

Shall contain circular operating wheel, open counter clockwise, conform to AWWA C-509 latest and shall be epoxy coated inside and out. Shall have flanged ends, cast iron bodies, o-ring type stem, bronze stem, and be non-rising stem. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>M &amp; H</u></b>	<b><u>AVK</u></b>
4"	STYLE 4067-02	SERIES 25
6"	STYLE 4067-02	SERIES 25
8"	STYLE 4067-02	SERIES 25
12"	STYLE 4067-02	SERIES 25

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-04-06**

**NOMENCLATURE:**

GATE VALVE, RESILIENT SEAT, THREADED, STAINLESS STEEL STEM

**DESCRIPTION:**

Shall contain two inch (2") square operating nut, open counter clockwise, conform to AWWA C-509 latest, be epoxy coated on inside, tar coating on outside, have threaded ends, cast iron body o-ring type stem and non-rising stainless steel stem, grade 304 SST. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>AVK</u></b>
2"	03-063-35

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-04-07**

**NOMENCLATURE:**

GATE VALVE, RESILIENT SEAT, N.R.S., MECHANICAL JOINT, STAINLESS STEEL STEM

**DESCRIPTION:**

Shall contain two inch (2") square operating nut, open counter clockwise, conform to AWWA C-509 latest and shall be epoxy coated on inside, tar coating on outside. Shall have mechanical joint ends and come with accessories. Shall have ductile iron body o-ring type stem and non-rising stainless steel stem, grade 304 SST. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

	<u>MANUFACTURER</u>
<u>SIZE</u>	<u>AVK</u>
4"	25-100-XO-ZVI-001
6"	25-150-XO-ZVI-001
8"	25-200-XO-ZVI-001
10"	25-300-XO-ZVI-001

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-04-08**

**NOMENCLATURE:**

GATE VALVE, RESILIENT SEAT, N.R.S., FLANGED JOINT, STAINLESS STEEL STEM

**DESCRIPTION:**

Shall contain circular operating wheel, open counter clockwise, conform to AWWA C-509 latest and shall be epoxy coated inside and out. Shall have flanged ends, cast iron bodies, o-ring type stem and non-rising stainless steel stem, grade 304 SST. Valve shall be pressure rated for 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>AVK</u></b>
4"	25-100-46
6"	25-150-46
8"	25-200-46
10"	25-300-46

**\*\*\* SHOP DRAWING REQUIRED \*\*\***

**MATERIAL SPECIFICATION: 509-10-05-01**

**NOMENCLATURE:**

TAPPING VALVE, RESILIENT SEAT, N.R.S., MECHANICAL JOINT X FLANGE,  
BRONZE STEM

**DESCRIPTION:**

Shall contain two inch (2") square operating nut, shall open counter clockwise, shall conform to AWWA C-509 latest, and shall be epoxy coated inside and out. Shall be flanged by mechanical joint and come with accessories. Shall have cast iron body, o-ring type stem & non rising bronze stem. Shall have the aligning ring to align valve to sleeve. Valve shall have a pressure rating of 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>M &amp; H</u>	<u>AVK</u>
4"	STYLE 4751-01	SERIES 25
6"	STYLE 4751-01	SERIES 25
8"	STYLE 4751-01	SERIES 25
12"	STYLE 4751-01	SERIES 25
16"	STYLE 4751-01	SERIES 25
24"	STYLE 4751-01	SERIES 55
30"	STYLE 4751-01	SERIES 55

**MATERIAL SPECIFICATION: 509-10-05-02**

**NOMENCLATURE:**

TAPPING VALVE, RESILIENT SEAT, N.R.S., MECHANICAL JOINT X FLANGE,  
STAINLESS STEEL STEM

**DESCRIPTION:**

Shall contain two inch (2") square operating nut, shall open counter clockwise, shall conform to AWWA C-509 latest, and shall be epoxy coated inside and out. Shall be flanged by mechanical joint and come with accessories. Shall have cast iron body, o-ring type stem and non rising stainless steel stem. Shall have the aligning ring to align valve to sleeve. Valve shall have a pressure rating of 175 psi.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<u>SIZE</u>	<u>AVK</u>
4"	45-100-61
6"	45-150-61
8"	45-200-61
12"	45-300-61
16"	
24"	
30"	

**MATERIAL SPECIFICATION: 509-10-06-01**

**NOMENCLATURE:**

AIR RELEASE VALVES

**DESCRIPTION:**

Shall be of the type designed for use in water distribution systems to exhaust entrapped air. Valve shall be simple lever type and be constructed and tested to 175 psi working pressure, have stainless steel inner working parts with a cast iron body and cover, NPT threaded inlet and outlets.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

**MANUFACTURER**

<b><u>SIZE</u></b>	<b><u>EMPIRE</u></b>	<b><u>VAL-MATIC</u></b>
$\frac{3}{8}$ " x $\frac{1}{16}$ "	FIG 910-H	MODEL 15
$\frac{3}{8}$ " x $\frac{3}{32}$ "	FIG 910	MODEL 22
$\frac{3}{8}$ " x $\frac{1}{8}$ "		MODEL 25

**MATERIAL SPECIFICATION: 509-10-06-02**

**NOMENCLATURE:**

AIR RELEASE VALVES, PLASTIC

**DESCRIPTION:**

Shall be of the type designed for use in water distribution systems to exhaust entrapped air. Valve shall be simple lever type and be constructed and tested to 175 psi working pressure, have PVC inner working parts with a PVC body and cover, NPT threaded inlet and outlets.

**APPROVED MANUFACTURING AND CATALOG NUMBERS**

<u>SIZE</u>	<u>MANUFACTURER</u>
2"	ARI S-021