

03-10-2025

ITEM NO. 511 WATER VALVES ~~11-06-23~~ XX-XX-XX

511.3 Materials

A. Iron-Body Gate Valves

Reduced-wall, resilient-seated gate valves for potable or reclaimed service, including tapping valves, shall conform to AWWA ~~C-515~~ C515 and SPL WW-700.

1. ~~Stem Seals: All valves shall have approved O-ring type stem seals. At least two O-rings shall be in contact with the valve stem where it penetrates the valve body.~~
2. ~~Operation: All valves shall have non-rising stems with a 2-inch square operating nut, or with a spoke type handwheel when so ordered, turning clockwise to close.~~
3. ~~Gearing: Gate valves in 24-inch and larger sizes shall be geared and, when necessary for proper bury depth and cover, shall be the horizontal bevel geared type enclosed in a lubricated gear case.~~
4. ~~Bypass: Unless otherwise indicated on the Drawings, 30-inch and larger metal seated gate valves shall be equipped with a bypass of the non-rising stem type which meets the same AWWA standard required for the main valve.~~
5. ~~Valve Ends: Valve ends shall be push-on, flanged or mechanical joint, as indicated or approved.~~
6. ~~Gear Case: All geared valves shall have enclosed gear cases of the extended type, attached to the valve bonnet in a manner that makes it possible to replace the stem seal without disassembly and without disturbing the gears, bearing or gear lubricant. Gear cases shall be designed and fabricated with an opening to atmosphere so that leakage past the stem seal does not enter the gear case.~~
7. ~~Valve Body: Double disc gate valves in 30-inch and larger sizes installed in the horizontal position shall have bronze rollers, tracks, scrapers, etc. For reclaimed water valves, the body shall be manufactured in purple, factory painted purple, or field painted purple.~~

B. Plug Valves for Wastewater

Resilient-Seated Eccentric Plug Valves shall conform to AWWA C517 and SPL WW-703.

C. Ball Valves

Ball valves shall be brass, bronze, stainless steel or PVC as indicated on the Drawings or Details or as approved by the Engineer or designated representative.

D. Combination Air Valves

Combination Air Valves (CAVs) shall conform to AWWA C512 and SPL WW-462 for wastewater service, ~~WW-462A for potable service,~~ and WW-462~~BA~~ BA for potable and reclaimed service.

E. Fire Hydrants

Fire Hydrants shall conform to AWWA C502 and SPL WW-3. All fire hydrants shall be Dry Barrel, Traffic Model (break-away), Post Type having Compression Type Main Valves with 5¼ inch opening, closing with line pressure.

1. Applicable Specifications

AWWA ~~C-502~~ C502 current: "AWWA Standard for Dry-Barrel Fire Hydrants."

NFPA 1963: "National (American) Standard Fire Hose Coupling Screw Thread" and City of Austin 4-inch 4-inch Fire Hose Connection Standard.

ANSI A-21.11 current: "American National Standard for Rubber Gasket Joints for Cast Iron and Ductile Iron Pressure Pipe and Fittings."

2. Functional Requirements

Design Working Pressure shall be 200 psi and a test pressure of 400 psi.

Inlet shall be side connection hub end for mechanical joint (ANSI A-21.11-current). Shoe shall be rigidly designed to prevent breakage.

Lower Barrel shall be rigid to assure above ground break at traffic feature. Bury length of hydrant shall be 4 feet minimum, 5 feet maximum (hydrant lead pipe may be elbowed up from main using restrained joints; flanged joints in lead pipes are not allowed). Flange type connections between hydrant shoe, barrel sections and bonnet shall have minimum of six corrosion resistant bolts.

Hydrant Main Valve shall be 5¼ inch I.D. Valve stem design shall meet requirements of AWWA C502, with Operating Nut turning clockwise to close. Operating Nut shall be pentagonal, 1½ inch point to flat at base, and 1 7/16 inches at top and 1-inch minimum height. Seat ring shall be bronze (bronze to bronze threading) and shall be removable with lightweight stem wrench. Valve mechanisms shall be flushed with each operation of valve; there shall be a minimum of two drain ports.

Traffic Feature shall have replaceable breakaway ferrous metal stem coupling held to stem by readily removable type 302 or 304 stainless steel fastenings. Breakaway flange or frangible lugs shall be designed to assure aboveground break. Breakaway or frangible bolts will not be acceptable.

Outlet Nozzles shall be located approximately 18 inches above ground. Each hydrant shall have two 2½ inch nozzles 180 degrees apart with National (American) Standard Fire Hose Coupling Screw Thread NFPA 1963 and one 4-inch pumper nozzle with City of Austin (COA) standard thread-six threads per inch "Higbee" cut, 4.859-inch O.D., 4.6425-inch root diameter. Nozzles shall be threaded or cam-locked, O-ring sealed, and shall have type 302 or 304 stainless steel locking devices. Nozzle caps (without chains) and cap gaskets shall be furnished on the hydrant. The cap nut shall have the same configuration as the operating nut.

Hydrants shall be Dry-Top Construction, factory lubricated oil or grease with the lubricant plug readily accessible. The system shall be described for City approval.

A blue Type II-B-B reflectorized pavement marker, conforming to Standard Specification Item No. 863S, shall be placed 2 to 3 feet offset from the centerline of paved streets, on the side of and in line with, all newly installed fire hydrants.

Hydrant shall have double O-ring seals in a bronze stem sheath housing to assure separation of lubricant from water and shall have a weather cap or seal, or both, as approved by the Owner, to provide complete weather protection.

3. Material Requirements

All below ground bolts shall be corrosion resistant. The hydrant valve shall be Neoprene, 90 durometer minimum. The seat ring, drain ring, operating nut and nozzles shall be bronze, AWWA ~~C-502~~ **C502** current, containing not over 16 percent zinc. Break-away stem coupling shall be of ferrous material; its retaining pins, bolts, nuts, etc. of type 302 or 304 stainless steel.

Coatings shall be durable and applied to clean surfaces. Exterior surfaces above ground shall receive a coating of the type and color specified in the applicable version of AW SPL WW-3. The coating shall be applied according to coating manufacturer's specifications. Other exposed ferrous metal shall receive asphalt-based varnish, or approved equal, applied according to the coating manufacturer's specifications.

F. Pressure/Flow Control Valves

All control valves to regulate pressure, flow, etc., in City lines shall be models listed in the AW SPL WW-319 and shall conform to AWWA C530.

G. Drain Valves

Drain valve materials and installation shall conform to COA Standard 511-AW-03.

H. Valve Stem Extensions:

Valve stem extensions shall consist of a single piece of the required length with a socket on one end and a nut on the other.

Source: Rules No. R161-22.04 , 2-14-2022; Rule No. R161-22.13 , 11-7-2022; Rule No. R161-23.14 , 8-10-2023; Rule No. R161-23.25 , 11-6-2023.

511.4 Construction Methods

A. Setting Valves, Drains and Air Valves

Unless otherwise indicated, main line valves, drain valves and piping, combination air valve and pressure/flow control valve assemblies, and other miscellaneous accessories shall be set and jointed in the manner described for cleaning, laying, and jointing pipe.

Unless otherwise indicated, valves shall be set at the locations shown on the Drawings and such that their location does not conflict with other appurtenances such as curb ramps. Valves shall be installed so that the tops of operating stems will be at the proper elevation required for the piping at the location indicated above. Valve boxes and valve stem casings shall be firmly supported and maintained, centered and aligned plumb over the valve or operating stem, with the top of the box or casing installed flush with the finished ground or pavement in existing streets, and installed with the top of the box or casing approximately 6 inches below the standard street subgrade in streets which are excavated for paving construction or where such excavation is scheduled or elsewhere as directed by the Engineer or designated representative.

Drainage branches or air blowoffs shall not be connected to any sanitary sewer or submerged in any stream or be installed in any other manner that will permit back siphonage into the distribution system (see COA "Standard Series 500"). Every drain line and every air release line shall have a **full-sized** **full-sized** independent gate valve flanged directly to the main. Flap-valves, shear gates, etc., will not be accepted.

B. Setting Fire Hydrants

Fire hydrants shall be located in a manner to provide accessibility and in such a manner that the possibility of damage from vehicles or conflict with pedestrian travel will be minimized. Unless otherwise directed, the setting of any hydrant shall conform to the following:

Hydrants between curb and sidewalk on public streets, shall be installed as shown on Standard 511- AW-02 with outermost point of large nozzle cap 6 inches to 18 inches behind back of curb. Where walk abuts curb, and in other public areas or in commercial areas, dimension from gutter face of curb to outermost part of any nozzle cap shall be not less than 3 feet, nor more than 6 feet, except that no part of a hydrant or its nozzle caps shall be within 6 inches of any sidewalk or pedestrian ramp. Any fire hydrant placed near a street corner shall be no less than 20 feet from the curb line point of tangency. Fire hydrants shall not be installed within 9 feet vertically or horizontally of any sanitary sewer line regardless of construction.

All hydrants shall stand plumb; those near curbs shall have the 4-inch nozzle facing the curb and perpendicular to it. The hydrant bury mark shall be located at ground or other finish grade; nozzles of all new hydrants shall be approximately 18 inches above grade. Lower barrel length shall not exceed 5 feet. Barrel extensions are not permitted unless approved by the Engineer or designated representative. Each hydrant shall be connected to the main by 6-inch ductile iron pipe; a 6-inch gate valve shall be installed in the line for individual shutoff of each new hydrant.

Below each hydrant, a drainage pit 2 feet in diameter and 2 feet deep shall be excavated and filled with compacted coarse gravel or broken stone mixed with coarse sand under and around the bowl of the hydrant, except where thrust blocking is located COA Specification Item 510 and Standard 510-6 and to a level 6 inches above the hydrant drain opening.

The hydrant drainage pit shall not be connected to a sanitary sewer. The drain gravel shall be covered with filter fabric to prevent blockage of voids in the gravel by migration of backfill material. The bowl of each hydrant shall be well braced against unexcavated earth at the end of the trench with concrete thrust blocking (taking care not to obstruct the hydrant drain holes), or the hydrant shall be tied to the pipe with approved metal harness rods and clamps. The fire line shall be provided with joint restraint from the main line to the fire hydrant. Hydrants shall be thoroughly cleaned of dirt or foreign matter before setting.

Fire hydrants on mains under construction shall be securely wrapped with a poly wrap bag or envelope taped into place. When the mains are accepted and placed in service the bag shall be removed.

- C. Pressure Taps: Refer to Section 510.3 (24) of Standard Specification Item Number 510, "Pipe."

- D. Plugging Dead Ends

Standard plugs shall be inserted into the bells of all dead ends of pipes, tees or crosses and spigot ends shall be capped. All end plugs or caps shall be secured to the pipe conforming to Section 510.3 (22) of Standard Specification Item Number 510, "Pipe."

- E. Protective Covering

Unless otherwise indicated, all flanges, nuts, bolts, threaded outlets and all other steel component shall be coal tar coated and shall be wrapped with standard minimum 8-mil low density polyethylene film or a minimum 4-mil cross laminated high-density polyethylene meeting ANSI/AWWA Specification ~~C-105~~ **C105** current, with all edges and laps taped securely to provide a continuous and watertight wrap. Repair all punctures of the polyethylene, including those caused in the placement of bedding aggregates, with duct tape to restore the continuous protective wrap before backfilling. For reclaimed water piping, the polyethylene shall be purple.

- F. Valve Box, Casing and Cover

Stems of all buried valves shall be protected by valve box assemblies. Valve box castings shall conform to ASTM A 48, Class 30B. Testing shall be verified by the manufacturer at the time of shipment. Each casting shall have cast upon it a distinct mark identifying the manufacturer and the country of origin. Valve boxes and covers for potable water shall be round. Valve boxes and covers for reclaimed water piping shall be square and shall have "Reclaimed Water" indicated on the lid.

- G. Drain Valve Installations

Refer to Standard 511-AW-03.

- H. Combination Air Valve **(CAV)** Assemblies

~~Refer to Standard 511-AW-04.~~ **Refer to Standard 511-AW-04A, for potable and reclaimed waterline CAV assemblies and Standard 511-AW-04B, for force main CAV assemblies.**

- I. Pressure/Flow Control Valves

Refer to Standard Specification Item No. 512, "Pre-Cast Water Utility Vaults", and Standard 512-AW-01.

- J. Connections to Existing System

Refer to Standard Specification Item No. 510, "Pipe" for connections to the existing system.

- K. Shutoffs

Refer to Standard Specification Item No. 510, "Pipe" for shutoffs.

Source: Rules No. R161-22.04 , 2-14-2022; Rule No. R161-22.13 , 11-7-2022; Rule No. R161-23.14 , 8-10-2023.

511.5 Measurement

All types of valves will be measured per each. Fire hydrants and drain valve assemblies will be measured per each. Fire Hydrant barrel extensions will be measured per vertical foot. Pressure/Flow control valve assemblies will be measured in accordance with Standard Specification Item 512, "Pre-Cast Water Utility Vaults." Combination air valve assemblies will be measured per each. Reflectorized pavement markers for identifying the location of newly installed fire hydrants will be measured per each, as per Standard Specification Item No. 863S.7.

Bury depths exceeding 5.5 feet are defined as Additional Bury Depths. Additional bury depths will only be measured if indicated on the Drawings and identified in the Standard Contract Bid Form 00300U; otherwise, the unit bid price for each completed unit includes all depths.

Source: Rules No. R161-22.04 , 2-14-2022; Rule No. R161-22.13 , 11-7-2022; Rule No. R161-23.14 , 8-10-2023.

511.6 Payment

Payment shall include full compensation, in accordance with the pay item established in the bid, for excavation, furnishing, hauling and placing valves, drain valve assemblies, fire hydrants and barrel extensions including anchorage and all incidental materials and work; preparing, shaping, dewatering, bedding, placing and compacting backfill materials and for all other incidentals necessary to complete the installation, as indicated in the Drawings, complete in place.

Payment for iron fittings and for wet connections is covered in Section 510.6 of Standard Specification Item 510, "Pipe."

Payment for excavation safety systems is covered in Section 509S.10 of Standard Specification Item 509S, "Excavation Safety Systems."

- A. Valves: Valves will be paid for at the unit bid price for the size and type valve installed, including valve stem casing and cover, excavation and backfill, setting, adjusting to grade, anchoring in place, and other appurtenances necessary for proper operation.
- B. Fire Hydrants: Fire Hydrants installation shall be paid for at the unit bid price, which includes all necessary labor and materials to set, adjust to grade and anchor the hydrant body, barrel extensions, concrete block, gravel drain and other appurtenances necessary for proper operation; but shall not include pipe and valve between the main line and fire hydrant base.
- C. Pressure or Flow Control Valve Assemblies: Pressure control and flow control valve assemblies will be paid for in accordance with Standard Specification Item 512, "Pre-Cast Water Utility Vaults."
- D. Drain Valve Assemblies: Drain valve installation shall be paid for at the unit bid price, which includes all necessary labor and materials to set, adjust to grade and anchor the bends, vertical piping, blind flange, joint restraint devices, concrete blocking, concrete pad the drain valve, setting, adjusting to grade, anchoring in place, and other appurtenances necessary for proper operation; but shall not include pipe and valve between the main line and drain valve buried bend.
- E. Combination Air Valve (CAV) Assemblies: CAV assemblies will be paid for at the unit bid price and will include the main line tap or outlet, all pipe, valves, fittings, box or vault and cover, and other appurtenances necessary for proper operation. **for Type I or Type II installation.**
- F. Additional Bury Depth: Additional bury depth will be paid for at the unit bid price, which will include all work necessary to install units with bury depths exceeding 5.5 feet.
- G. Fire Hydrant Barrel Extensions: Hydrant barrel extensions will be paid for at the unit bid price which will include necessary hardware and rod extensions.

- H. Reflectorized Pavement Markers: Pavement markers will be paid for at the unit bid price, which will include necessary surface preparation and adhesive, as per Standard Specification Item No. 863S.8.

Payment, when included as a contract pay item, will be made under one of the following:

Pay Item No. 511-A:	Valves, _____ Type, ____ Diameter	Per Each.
Pay Item No. 511-B:	Fire Hydrants (See Standard No. 511-AW-02)	Per Each.
Pay Item No. 511-D:	Drain Valve Assemblies (See Standard No. 511-AW-03)	Per Each.
Pay Item No. 511-E:	Combination Air Valve (CAV) Assembly, _____ Diameter. (See Standard No. 511-AW-04)	Per Each.
Pay Item No. 511-E-WL-T1:	Combination Air Valve (CAV) Assembly, _____ Diameter. (See Standard No. 511-AW-04A, "Type I")	Per Each.
Pay Item No. 511-E-WL-T2:	Combination Air Valve (CAV) Assembly, _____ Diameter. (See Standard No. 511-AW-04A, "Type II")	Per Each.
Pay Item No. 511-E-FM-T1:	Combination Air Valve (CAV) Assembly, _____ Diameter. (See Standard No. 511-AW-04B, "Type I")	Per Each.
Pay Item No. 511-E-FM-T2:	Combination Air Valve (CAV) Assembly, _____ Diameter. (See Standard No. 511-AW-04B, "Type II")	Per Each.
Pay Item No. 511-F:	Additional Bury Depth	Per Vertical Foot.
Pay Item No. 511-G:	Fire Hydrant Barrel Extensions	Per Vertical foot.

Source: R161-22.04 , 2-14-2022; Rule No. R161-22.13 , 11-7-2022; Rule No. R161-23.14 , 8-10-2023.

END

SPECIFIC CROSS REFERENCE MATERIALS	
Standard Specification Item No. 511, "Water Valves"	
COA Standard Specification Items	
Designation	Description
Item 510	Pipe
Item 510.3 (22)	Pipe Anchorage, Support and Protection
Item 510.3 (24)	Water System Connections
COA Standard Details	
Designation	Description
511-AW-04	Air Release and Air/Vacuum Valve
511-AW-03	Drain Valve
511-AW-02	Fire Hydrant
AW SPLs	
Designation	Description
SPL WW-462	Air Release/Vacuum Relief Combination Air Valves for Wastewater
SPL WW-462A	Air Release/Vacuum Relief Combination Air Valves for Potable and Reclaimed Water
SPL WW-462B	Air Release/Vacuum Relief Valves for Reclaimed Water
SPL WW-700	Resilient-Seated Gate Valves, AWWA C-515 C515
SPL WW-703	Resilient-Seated Eccentric Plug Valves for Wastewater, AWWA C517
ANSI/AWWA Standards	
Designation	Description

A-21.11	American National Standard for Rubber Gasket Joints for Cast Iron and Ductile Iron Pressure Pipe and Fittings
C-105 C105	American National Standard for Polyethylene Encasement for Ductile-Iron Pipe
C-500 C500	Metal-Seated Gate Valves for Water Supply Service
C-502 C502	Dry-Barrel Fire Hydrants
C-504 C504	Rubber-Seated Butterfly Valves
C-512 C512	Air-Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service
C-515 C515	Reduced-Wall, Resilient-Seated Gate Valves For Water Supply Service-515
C517	<u>Resilient-Seated Cast-Iron Eccentric Plug Valves</u>
ASTM Standards	
<u>Designation</u>	<u>Description</u>
ASTM A48/A48M	Specification for Gray Iron Castings
ASTM A 536	Specification for Ductile Iron Castings
National Fire Protection Association (NFPA)	
1963 National (American) Standard Fire Hose Coupling Screw Thread	

<u>RELATED CROSS REFERENCE MATERIALS</u>	
<u>Specification 511, "Water Valves"</u>	
COA Standard Specification Items	
<u>Designation</u>	<u>Description</u>
Item No. 501	Jacking or Boring Pipe
Item No. 503	Frames, Grates, Rings and Covers
Item No. 505	Concrete Encasement and Encasement Pipe
Item No. 506	Manholes
Item No. 507	Bulkheads
Item No. 508	Miscellaneous Structures and Appurtenances
Item No. 509	Trench Safety Systems

END

Source: Rule No. R161-22.13 , 11-7-2022; Rule No. R161-23.14 , 8-10-2023.