

ITEM W27

VALVES

1.0 DESCRIPTION. This item includes the furnishing and installation of all gate and other miscellaneous valves; and all pertinent accessories, including tapping sleeves (as required), complete and in place, ready for service as shown in the Drawings and described in this Item.

Each valve unit shall be furnished complete with valve; and, where appropriate, gears, extension stem, guide bearing and support and any other appurtenances necessary for the completion of this work.

All work performed under this Item shall be in accordance with all approved trade practices and manufacturer's recommendations.

2.0 SUBMITTALS. The contractor shall submit the following information:

A. Reference Standards. Latest revisions:

1. ANSI B16.1.
2. ANSI/NSF 61 & 372.
3. ASTM A193.
4. ASTM A307.
5. ASTM A534.
6. ASTM A536.
7. ASTM A743.
8. ASTM B62.
9. ASTM B138.
10. ASTM D2000.
11. ASTM D429-73.
12. AWWA C504.
13. AWWA C509.
14. AWWA C550.

B. Shop Drawings.

1. All shop drawings submitted electronically for review and approval shall be returned within two weeks either approved or marked up for further design.
2. After examination of such drawings by the Engineer and the return thereof, the Contractor shall make such correction to the shop drawings as have been indicated and shall furnish the Engineer with electronic corrections.
3. Shop drawings shall be complete in details and indicate all materials as specified herein.
4. Manufacturer's illustrated catalog data and parts schedule in sufficient detail to serve as a guide in assembly and disassembly of the valve and in ordering repair parts.

5. Manufacturer's catalog or general web-site information will not be sufficient to fulfill shop-drawing requirements.
6. Prior to or with the delivery of equipment, the manufacturer shall provide two (2) copies of an operation and maintenance manual including storage, installation, start-up, operating and maintenance instructions, and a complete parts list and recommended spare parts list.
7. The O & M manuals shall be in compliance with the General Requirements.

C. Calculations. This section is not applicable.

D. Certifications.

1. Manufacturer's certification of compliance with all applicable provisions of AWWA Standards and with the supplementary specifications included herein.
2. A certified report of shop operations and leakage tests.

3.0 MATERIALS. Only materials approved by the Stark County Metropolitan Sewer District may be used for this project.

A. General.

1. All valves and appurtenances shall be of standard make approved by the Engineer and shall have the name, monogram or initials of the manufacturer cast thereon.
2. They shall be built and equipped for the type of operation shown on the Drawings, specified herein, or as directed by the Engineer.
3. Unless otherwise specified, valves with screw stems shall open by turning counterclockwise (left), the direction being indicated by an arrow cast where easily visible to the operator.
4. Valves shall be provided with a 2" square operating nut.
5. Valves shall be provided with hubs, spigots, flanges, mechanical groove-type, screw, or other connections compatible with pipe in which they are installed or scheduled.
6. All valves shall include Mega Lugs and bolts.
7. Unless otherwise specified, a stuffing box packed with O-ring seals shall be used to seal the stem of the valve.
8. The seal system used shall be replaceable without removing bonnet or rotating element.
9. Gaskets shall be of rubber composition.
10. Bolts and nuts shall be 316 stainless steel, unless otherwise shown or specified.

B. Tapping Sleeve.

1. Tapping sleeve shall be Style SSTIII-MJ by Romac or approved equal.
2. Tapping sleeve shall be a split sleeve drop in bolt design manufactured of 304L stainless steel with a rated working pressure of 250 psig.
3. Outlet shall have a ¾" NPT brass test plug with a square head.

4. Outlet flange shall be class 125 with drilling and dimensions in compliance with ANSI B16.1.
5. Outlet flange shall be MJ type 304 stainless steel.
6. Gasket shall completely circle the interior of the shell to provide a 360-degree seal.
7. Bolts, nuts, and washers shall be type 304 stainless steel per ASTM A193.
8. Side bars shall be of heavy duty 304L stainless steel construction using a drop in bolt design to ease installation.
9. All tapping sleeves shall be NSF 61 certified.

C. Gate Valves (6" through 14").

1. The valves shall be resilient seated gate valves, as manufactured by Mueller Co. or SCMSD approved equal, and shall be manufactured to meet or exceed AWWA C509.
2. Valves shall have a working pressure of 250 psig.
3. Valves shall have a smooth, unobstructed waterway free from any sedimentation pockets.
4. Valves shall be 100% port when fully open.
5. The ductile iron valve disc and guide lugs shall have their surfaces permanently bonded with SBR ASTM D2000 rubber material to meet ASTM tests for rubber to metal bond ASTM D429-73.
6. Stuffing boxes shall be O-ring seal type with two (2) rings located in stem above and one (1) below the thrust collar.
7. Joints shall be of the mechanical joint type for buried service, and of the flanged type for all other service on this contract.
8. Stuffing box and bonnet bolts and nuts shall meet the mechanical strength requirements of ASTM A307, 60,000 psi tensile strength, shall have regular heads, and shall be made of type 316 stainless steel.
9. Non-rising stems (NRS) stems shall have a cast integral stem collar and be furnished of bronze meeting ASTM B138.
10. Stem nuts shall be independent of wedge and be made of solid bronze meeting ASTM B62.
11. Thrust bearings shall be of the low friction torque reduction type, located both above and below the stem collar.

D. Butterfly Valves (16" through 20").

1. Valves shall have a working pressure of 250 psi and shall be manufactured in full compliance with AWWA Specification C504.
2. Valve bodies shall be a flanged type design as indicated on the contract Drawings; constructed of ductile iron ASTM A-536 Class 65-45-12.
3. All valve bodies shall have interior and exterior surfaces painted per ANSI/AWWA C504.
4. All valves shall have all internal and external ferrous surfaces coated with a fusion bonded thermosetting powder epoxy coating of 10 mils nominal thickness.
 - a. The coating shall conform to AWWA C550.
5. Discs shall be offset to provide an uninterrupted 360-degree seating edge and shall be ductile iron per ASTM A536 (65-45-12) or 316 stainless steel ASTM A743.

- a. The disc seating edge shall be solid 316 stainless steel.
- b. The disc shall be securely attached to the valve shaft utilizing a tangential pin locked in place with a set screw.
6. Valve seats shall be molded or vulcanized to the valve body and shall be of Acrylonitrile-Butadiene (NBR).
7. Valve shafts shall be of ASTM A564 Type 630, 17-4 PH stainless steel.
8. Valve shaft seals shall be self-compensating V-type packing with a minimum of four sealing rings.
9. Provide 316 stainless steel bolts and nuts.
10. Valves shall be as manufactured by Dresser, Keystone, DeZurik/BAW, or an approved equivalent.
11. Each valve and valve actuator shall be assembled, adjusted, and tested as a unit per ANSI/AWWA C504, by the valve manufacturer.

E. Operations.

1. Valves shall be equipped with nut gears, and other appurtenances as required for manual operation as specified or scheduled.
2. All valves shall be gear operated.
 - a. Gears for valve operation shall be sized for the working pressure and installed in such a manner that the stuffing box will be accessible for packing.

F. Valve Boxes.

1. Valve boxes shall be standard, three-piece screw type, cast iron adjustable boxes, with tops of boxes set flush to finish grade.
2. The cover shall be marked "WATER".
3. Acceptable manufacturers shall be Ford, East Jordan or an approved equal.

G. Extension Stems and Stem Guides.

1. Each valve shall be provided with extension stem, when required for ease of operation.
2. Unless otherwise specified, each extension system shall be made of rolled-cold steel material and the same size as the valve stem of the valve it operates.
3. The guide block shall be bronze bushed where it contacts the extension stem.
4. All valves which are to be operated by T-wrench shall have 2-inch square operating nut at the top of the extension stem.
5. Tee wrenches shall be supplied as required or specified.
 - a. Handle shall extend to 3'-0" above finish grade.

H. Tee Wrenches.

1. Two (2) tee wrenches shall be supplied by the Contractor.
 - a. Each wrench shall be made of solid steel (shaft and tee handle).
 - b. Each wrench shall be six (6) feet long and operate standard 2" valve nuts to the satisfaction of SCMSD staff.
2. All tee wrenches supplied shall be capable of engaging a 2-inch square operating nut with a handle that extends 3'-0" above finish grade.

3. No extra or separate payment will be made for supplying required wrenches and all costs shall be included for payment under the applicable bid item(s) to which it is related.

4.0 EXECUTION. The Contractor shall provide all labor, materials, equipment, and tools necessary to provide and install the valves as shown on all detailed Drawings and specified as below.

A. Installation.

1. All valves shall be carefully installed in their respective positions free from distortion and stress.
2. Connecting joints shall conform to applicable requirements of the Specifications.
3. Stem guides shall be accurately aligned.

5.0 ELECTRICAL. This section is not applicable.

6.0 QUALITY ASSURANCE. The work covered under this section of the Specification is intended to be the work, materials, labor, and equipment required to install the valves as described above. All material used on this project shall be new and unused unless otherwise specified and all workmanship shall be of the best quality. All valves shall be protected at all times from rust or damage, both before and after erection, until the completion of the Contract. Only qualified and skilled workmen/women shall be employed for all phases of this project. All workmen/women shall be trained in trench safety.

A. Testing.

1. All valves shall be tested in place by the Contractor as far as practicable under conditions for the pipelines in which they are placed.
2. Defects revealed in valves or connections under test shall be corrected at the expense of the Contractor to the satisfaction of the Engineer.
3. Leakage testing shall follow the requirements of Item W34- including Appendix D.
4. Disinfection shall follow the requirements of Item W34.

B. Observation.

1. SCMSD designated representative will visually observe the work performed. The representative will notify the Engineer of any discrepancies with the contract documents in the course of the contractor performing the work. The progress observations by the SCMSD do not waive any rights or remedies, nor divest the Contractor of any responsibility for contract compliance or liability for damage.

C. Warranty.

1. The Contractor shall guarantee all materials and workmanship for a period of one (1) year from the acceptance of the water main after successfully passing all testing requirements above.
2. The Contractor, at their costs, shall be responsible to repair any defects or failures, due to workmanship reported to the Contractor after the testing procedures and/or within the one (1) year warranty period.
3. All repairs shall be made within one (1) week of notification of said defect/failure.
4. In addition to the one (1) year warranty as specified above the Contractor shall provide a two (2) year maintenance bond on the entire system equal to the amount of the Contract.
5. The valves shall be tested and certified to ANSI/NSF 61 & 372.

7.0 MEASUREMENT. The unit of measurement shall be the actual number of each type and size of valve, including valve box and tapping sleeve (as required) furnished; except those as paid under other items.

8.0 PAYMENT. The unit pricing stipulated for the provision of all labor, equipment, and materials necessary for each type and size of valve, as specified above and located on all detail Drawings, shall be unit pricing for valve as follows:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
W27	EA.	x" Tapping Sleeve and Valve
W27	EA.	x" Gate Valve
W27	EA.	x" Butterfly Valve

END OF SECTION