SECTION 02085 - VALVES AND COCKS

PART 1 GENERAL

1.1 REFERENCES

1. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:

   1) Section 02080 - Utility Pipe and Materials

3. American National Standard Institute (ANSI)/American Society of Sanitary Engineers (ASSE):

1)	1011	Hose Connection Vacuum Breakers
2)	1015	Double Check Backflow Prevention Assemblies

4. American National Standard Institute (ANSI)/American Water Work Association (AWWA):

1)	C 500	Standard for Metal Seated Gate Valves for Water Supply Service
2)	C 504	Standard for Rubber Seated Butterfly Valves
3)	C 508	Standard for Swing-Check Valves for Waterworks Service, 2 in (50mm) Through 24 in (600 mm) NPS (Includes addendum C 508a-93)
4)	C 509	Standard for Resilient-Seated Gate Valves for Water Supply Service (Includes addendum C 500a-95)
5)	C 512	Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service
6)	C 510	Double Check Valve Backflow Prevention Assembly
7)	C 800	Standard for Underground Service Line Valves and Fittings

5. American Society for Testing and Material (ASTM):

1)	A 126	Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

1.2 SYSTEM DESCRIPTION

1. General: Valves shall be non-rising stem, with handwheel, lever, nut, or hydraulic operator, as shown on the Plans and specified herein.

1.3 DELIVERY, STORAGE AND HANDLING

1. Delivery: Deliver valves to the job site packaged, tagged, and marked.

2. Storage: Store valves at the job site in a manner to prevent damage and accumulation of dirt and rust.

PART 2 PRODUCTS

2.1 GATE VALVES

1. Gate Valves: Valves shall be ductile iron, resilient wedge conforming to ANSI/AWWA C 509. Wedge disc shall have two seating surfaces and provide smooth unobstructed waterway with 100 percent smooth passage. The valve shall be designed so that no sliding or shear on the resilient seating surface is present when compressed to a drip tight shut off. Working pressure shall be at least 200 psi for valves 12 inches in diameter and smaller. Valves shall have O-ring seals and open left (counterclockwise) with a 2 inch square wrench nut. Handwheel operators shall be provided for all interior installation. Valves shall have a permanent designation of the direction of opening on the valve. Valve ends shall be of mechanical joint type unless otherwise shown on the plans. Valve shall have fusion bonded epoxy coating inside and out. The valve shall be permanently lubricated. The valve shall have a manganese bronze stem and nut with anti-thrust washers. Valves shall be Mueller A-2360-20, Kennedy 4571, American Flow Series 2500, Clow 2639, or AVK 45 or approved equal.

   Valves 3 inches and smaller shall be flanged and may be ANSI/AWWA C 500 double disc gate valves if resilient seat units are not available.

2. Tapping Sleeve and Tapping Valve: Complete assembly, including tapping sleeve, tapping valve, and bolts and nuts. Use sleeve and valve compatible with tapping machine. Tapping sleeve and appurtenances shall be approved by the Authority.

   1) Tapping Sleeve: Cast or ductile-iron, 2-piece bolted sleeve with flanged outlet for new branch connection. Sleeve shall have mechanical-joint ends with rubber gaskets or sealing rings in sleeve body. Include sleeve matching size and type of pipe material being tapped and of outlet flange required for branch connection.

2.2 CHECK VALVES

1. Check Valves (Liquid): Liquid check valves shall be of the swing check type, bronze mounted with cast iron body conforming to ANSI/AWWA C 508. Valve shall be operated by an external lever and adjustable weight. Disc shall provide a positive seal in the closed position and pivot to provide an unobstructed flowway in the open position. Valve shall be Kennedy Figure 106 LW, Mueller A 2600-01, GA Figure 250D or approved equal.

2. Backflow Preventer: Backflow preventer for installation on fire service line shall be a double check detector assembly. Main valve body shall be ductile iron coated with fusion bonded epoxy on the interior and exterior in accordance AWWA C 550. Unit shall conform to ASSE 1015, ANSI/AWWA C 510, UL, FM, and USC and shall be in accordance with the ACSA Cross Connection Control Program.

2.3 BUTTERFLY VALVES

1. Butterfly Valves (Water): Butterfly valves shall be rubber seated, short body in accordance with AWWA C 504, Class 250 B for installation between 125 pound standard flanges with ASTM A 126 Class B cast iron bodies, bronze discs, 416 stainless steel stems, #12 Buna-N or Ethylene-Propylene seat and steam O-rings, and with hand-wheel actuator with position indicator. Butterfly valves shall be DeZurik or approved equal.

2.4 PLUG VALVES

1. Plug Valves: Valves shall be cast iron provided with standard mechanical joint or flange ends as shown on the plans and shall be ANSI rated at 150 psi. Valve shall be capable of bubble tight closure but adjustable to stop positions partially closed for throttling. Underground valves shall be fitted with a standard 2 inch operating nut. Exposed valves shall be provided with a handwheel or lever handle for operation. Valve liners and seats shall be of a material suitable for use with an abrasive sanitary sludge.

2.5 PVC BALL VALVES

1. General: Valves shall be manufactured of PVC Type 1 Grade 1 with EPDM O-ring seals, true union connections, and threaded end connectors. Valves shall be listed by NSF International Standard 61.

2.6 CONTROL VALVES

1. Altitude (Water Level) Control Valve: Valve(s) shall be one way flow, automatic control valve used to shut off incoming flow in a reservoir at a field adjustable water level without the use of floats or other external control devices. Valve shall be of the center guided diaphragm actuated globe, or angle valve type, flanged end, capable of being serviced without removal from the piping. Body and cover shall be cast iron, ASTM A 126 Class B, with bronze seat. Valve stem shall be stainless steel and diaphragms shall be of reinforced synthetic rubber. Valve shall be non-throttling. The control pilot shall be a direct acting, adjustable, spring loaded diaphragm actuated valve of corrosion resistant construction. Water to the pilot shall be fed directly from a connection to the tank or as shown on the plans, and shall be filtered and fitted with shutoff cocks to isolate the control loop. Valve shall be rated for working pressures up to 150 psi and shall be provided to control water levels as shown on the plans near the mid range of its adjustment. Valve shall be Cla-Val or approved equal.

2.7 AIR RELEASE VALVES

1. Air Release Valves: Air release valve shall conform to ANSI/AWWA C 512 with a cast iron body, stainless steel float, bronze trim, Buna-N seat, and one inch threaded pipe inlet. Orifice shall be sized as shown on the plans. Air release valve shall be installed in accordance with Standard Detail W-6, and shall be Crispin Model PL10, Valmatic 15A, ClaVal Series 34 or approved equal.

2. Force Mains Air Release Valves: Air release valves shall be long bodied intended for sewage service with ½ inch orifice, vacuum check valve, 2 inch screened inlet.

2.9 MISCELLANEOUS VALVES

1. Corporation Stop: Shall be 3/4 inch unless otherwise indicated with inlet threads conforming to ANSI/AWWA C 800, commonly known as the “Mueller” thread, and an outlet compatible with the service pipe and shall be Ford #F600 or Mueller #H-15000 for copper outlet.

2. Hose Bibb: Assembly shall be anti-contamination wall faucet. Valve shall be furnished with approved vacuum breaker which complies with ANSI/ASSE 1011 and has 3/4 inch male hose threads. Valve shall be of brass construction with adjustable packing nut and deep stem guard, Teflon impregnated packing and standard "O" size washer and wheel handle. Inlet shall be 1/2 inch copper tube.

3. Sampling Taps: The sampling tap shall be plain end spigot facet, renewable seats, tee handles, polished chrome plated similar to American Standard 4221.024.

2.10 RELATED ITEMS

1. Valve Boxes: Boxes shall be furnished and installed for all valves buried in the earth. Valve boxes shall be installed directly over valves, and carefully backfilled so that the box is plumb, level and flush with the finish

grade. The valve boxes shall be a 2-piece sliding type , 24”-36” variable height with 5 ¼ inch shaft in accordance with Standard Detail W-7. The word “water” shall be cast on the box lid in letters not less than 1 inch high for all water valves. Valve box shall be Bingham and Taylor, Tyler Pipe #6855, or Capitol Foundry.

2. Valve Operators: Shall be either handwheel or wrench for nut operated valves as indicated on the plans. Minimum two wrenches shall be provided by the manufacturer of nut operated valves.

PART 3 EXECUTION

3.1 INSTALLATION - ALL VALVES

1. General: Valve installation shall comply with Standard Details and the Manufacturer's recommendations.

2. Stems: Shall be oriented for accessibility as approved by the Authority's representative. Do not install valves with stems in the downward direction.

3. Setting of Valves: A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished grade or as directed by the Authority’s Representative. Valves boxes shall be installed in accordance with the Standard Details W-7.

4. Transmitting Forces: Valves and valve boxes shall be installed so no forces are transmitted to the valve through the piping or valve boxes. All valves shall be provided with retainer glands and concrete block underneath.

5. Cleaning: All valves and appurtenances shall be flushed clear of all foreign material after installation.

6. Calibration: Contractor shall furnish the service of factory authorized service Engineer to instruct and check out the calibration of backwash plug valve.

7. Testing: Field test all valves and appurtenances for proper operation, proper adjustments and settings, freedom from vibration, binding, scrapings, and other defects. Check all valve supports for strength and high quality workmanship. All defects shall be corrected to the satisfaction of the Authority’s Representative. Hydrostatic and leakage tests shall be in accordance with Section 02080 - Utility Pipe and Materials .

END OF SECTION