

**Section 002340****VALVES****PART 1 - GENERAL**

The following specification is intended for use for the design, selection of materials, and installation of valves. All valves shall meet the requirements of the Florida Department of Environmental Protection (FDEP) permit.

**1.1 SCOPE****1.1.1 General:**

This specification provides the requirements for main lines three inch (3") in size and larger: gate, plug, butterfly, wet tapping and check valves for potable water, reclaimed water, force mains, low pressure sewer system force mains, and air release valves for installation for the project.

**1.1.1 Work Included**

The Contractor shall install, unless specified otherwise, the gate, plug, butterfly, wet tapping, check valves, and all other associated appurtenances for potable water, reclaimed water, force mains, low pressure sewer system force mains and air release valves in accordance with the project's engineering drawings and Specifications.

The Contractor shall, unless specified otherwise, furnish all labor, materials, equipment, tools and all other associated appurtenances, necessary to do the work required under the contract to include but not limited to unloading, hauling and distributing all valves restraints, valve boxes and appurtenances.

The Contractor shall also remove any surfacing as required; excavate the trenches and pits to the required dimensions; construct and maintain all bridges for traffic control; sheet, brace, and support the adjoining ground or structures; where necessary; handle all drainage or ground water; provide barricades, guards, and warning lights; install and test the valves, fittings and appurtenances; backfill and consolidate the trenches and pits; maintain all surfaces over the trench until surface restoration is completed; restore the surfaces unless otherwise stipulated; remove surplus excavated material; and clean the site of the work.

The Contractor shall also furnish all labor, materials, equipment, tools, and all other associated appurtenances required to rearrange sewers, conduits, ducts, pipes or other structures encountered in the installation of the valves.

**1.1.2 Location of the Work**

The location of this work is as shown on the Contract Documents.

### 1.1.3 Coordination of the Work

The Contractor shall be responsible for the satisfactory coordination of the installation of the potable water, reclaimed water, force mains and low pressure sewer system force mains valves with other construction and activities in the area. Delays in work resulting from lack of such harmony shall not in any way be a cause for extra compensation by any of the parties.

### 1.1.4 Working Hours

The work shall be carried out in accordance with local ordinance and so as not to cause any unreasonable nuisance to affected residents. Under emergency conditions, this limitation may be waived by the consent of Charlotte County Utilities (CCU).

## 1.2 **METHOD OF MEASUREMENT & PAYMENT**

The work shall be measured and the compensation determined in the following manner:

### 1.2.1 Check, Plug, Gate, Butterfly, Air Release, Cut-in Valve or Insert Valve and Wet Tapping Valves

- a. Check, plug, gate, and butterfly valves and air release valves shall be paid for at the contract unit price per each size installed including the valve, restraints, valve boxes, bedding material, dewatering, testing, all equipment, materials, labor and all other associated appurtenances to install and test the valves complete in place at the depth and location shown on the plans and/or as directed by CCU and restoration unless a separated bid contract item is provided.

In addition, air release valves installed on reclaimed water, force mains and low pressure sewer system force mains shall also include odor control and all other associated appurtenances in accordance with CCU standard details the cost of which shall be included in the contract bid price for air release valves.

*Note: Hydrant gate valves are to be supplied as part of the fire hydrant assembly, the cost of which shall be included in the contract bid price for each size specified for fire hydrant assemblies.*

- b. Wet tapping valve shall be paid for at the contract unit price per each size installed including the tapping sleeve, the wet tap into the main, the valve, restraints, fittings, valve boxes, bedding material, dewatering, testing, all equipment, materials, labor and all other associated appurtenances to install and test the wet tapping valve complete in place at the depth and location shown on the plans and/or as directed by CCU and restoration unless a separated bid contract item is provided.
- c. Cut-in valve or insert valve shall be paid for at the contract unit price per each size installed including the tapping into the main, the valve, restraints, fittings, valve boxes, bedding material, dewatering, testing, all equipment, materials, labor and all other associated appurtenances to install and test the cut-in or insert valve complete in place at the depth and location shown on the plans and/or as directed by CCU and restoration unless a separated bid contract item is provided.

### 1.3 REFERENCED STANDARDS (Latest Revision)

ANSI: 21.11, B16.1, 61, 77

AWWA: C-111, C-207, C-500, C-504, C-509, -512, C-515, C-550

ASTM: A-124, A-126, A-153, A-276, A-307, A-536

AASHTO Code

NSF: Standard 61

ISO

FDEP: Wastewater Collection/Transmission System Requirements

Florida Administrative Code

Ten States Recommended Standards for Water

Ten States Recommended Standards for Wastewater

### 1.4 PARTIAL LISTING OF RELATED SECTIONS

001570 - Erosion and Sediment Control

001760 - Surveying and Record Drawings

002325 - Force Mains

002330 - Low Pressure Sewer Systems

002335 - Potable Water and Reclaimed Mains

002345 - Fire Hydrants

002530 - Submersible Sewage Pump Lift Station-Package Design

002540 - Submersible Sewage Pump Lift Station- Standard Design

002240 - Dewatering

002930 - Grassing

Note: This is only a partial listing of related sections. The Contractor shall be responsible to review the entire contract documents.

### 1.5 SUBMITTALS

1.5.1 For only those materials that the Contractor is requesting deviations from these specifications, the Contractor shall submit in writing documentation to justify approval of these materials by Charlotte County Utilities (CCU) prior to the start of the project. The Contractor shall submit four (4) signed copies of the material submittals.

1.5.2 The contractor submittals shall include the statement that the submittals have been reviewed and the materials meet the contract specifications and/or standard details.

1.5.3 Final approval is at the discretion of CCU.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

The materials used in this work shall be all new and conform to the requirements for class, kind, size and material as specified below.

All valves furnished shall be of the type, kind, size, and class indicated for each particular line segment as shown on the engineering drawings and/or designated in the Contract Items.

#### **2.1.1 Gate Valves:**

##### **2.1.1.1 General:**

- a. All gate valves in applications such as hydrant valves, in-line valves, wet tapping valves, and cut-in valves shall meet all the gate valve material, manufacturer, installation, performance, and execution requirements.
- b. Gate valves shall be used on all potable and reclaimed water mains for all sizes. Gate valves fourteen (14) inches and larger shall be side actuated.

Side actuated Gate valves shall be used on 14" or larger force mains and low pressure sewer force mains.

Gate (tapping) valves shall be used for all tapping sleeves. Tapping valves 14" and larger shall be side actuated and the Contractor shall notify the supplier of this fact to ensure that the tapping valve has the same bolt pattern as the tapping sleeve.

- c. Hydrant gate valves shall be used when a hydrant tee is used for the installation of a hydrant from a potable water main.

##### **2.1.1.2 Manufacture:**

- a. Gate valves shall conform to the latest revision of AWWA C-500 "Gate Valves - 2 inch through 48 inch for Water and Sewage Systems" and be resilient wedge seated. The additional requirements and exceptions to the AWWA standards contained herein shall also be applicable. All components of this type of joint shall conform to AWWA Standard C-111, "Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings". All ductile iron valves shall be fusion bonded epoxy coated.

All coatings on valves in contact with potable water shall be certified to NSF 61.

Valves and required operating appurtenances shall be the product of the same manufacturer. All valves shall have the manufacturer and size of the valve visibly cast on the body or on a plate attached to the body of the valve. All valves shall be suitable for throttling service and/or frequent operation as well as service involving long periods of inactivity.

The operating pressure for all sizes shall be a minimum of 150 psi gage or of the adjacent piping which ever is greatest. Buried valves with diameters of 2" to 12" shall be installed vertically on horizontal pipelines without gearing, bypasses, rollers, or tracks.

- b. Valves shall be provided with a fully enclosed, permanently lubricated actuator of the traveling nut or worm gear design. The actuator shall be connected to the valve shaft by means of a key and keyway connection. All actuators shall have adjustable, mechanical stop limits in accordance with AWWA C-504 Section 3.8.2. All valve actuators shall be capable of withstanding 450 ft-lbs of input torque against the open or closed stops without damage.
- c. Valves for below ground applications shall have an AWWA wrench nut with a cast-in with an arrow indicating the direction on of opening. For a smooth shaft, the wrench nut shall be fastened to the input shaft by means of a minimum 5/16" diameter steel pin passing entirely through the shaft and the wrench nut; a key with keyway is acceptable. For a splined shaft, the wrench nut shall be formed to fit the splined shaft. The actuator shall be designed to produce the specified torque with a maximum input of 150 ft-lbs applied to the wrench nut. For aboveground valves, a hand wheel will be used with an arrow cast-in arrow indicating the direction of the opening. The hand wheel shall be fastened to the actuator input shaft to produce the specified torque with a maximum pull of 80 pounds of the hand wheel rim.
- d. Cut-in gate valves shall be resilient full seat and capable of handling working pressures up +250 psi. The insert valve shall have the capability of insertion into steel; C-900, C-905, and C-909 PVC; cast iron; and ductile iron piping. The cut-in valve shall be capable of installation and placing into operation in active potable and reclaimed water mains and active force mains and low pressure systems force mains without spillage or stopping the flow by isolating the inserting valve during installation.
- e. Insert Valves, Ductile Iron 250 p.s.i.g., shall be a Resilient Wedge Gate Valve including ductile iron body, bonnet and wedge shall provide a strength and a pressure rating that meets or exceeds the requirements of AWWA C-515. The insert valves shall be designed for use in potable water, raw water, reclaimed water, sewage, irrigation and backflow control systems. The design shall allow the valve to be installed into an existing pressurized pipeline while maintaining constant pressure and service as usual. The resilient wedge shall seat on the valve body and not the pipe to obtain the optimum seating and flow control results. The resilient wedge shall be totally independent of the carrier pipe. The resilient wedge shall not come into contact with the carrier pipe or depend on the carrier pipe to create a seal.
- f. Tapping Sleeve shall be 316 Stainless Steel.
- g. All interior and exterior ferrous surfaces of the valve, including the disc, shall be coated with fusion bonded epoxy, NSF 61 certified when in contact with potable water. The epoxy shall be fusion bonded and have a nominal thickness of 8 mils and be in accordance with AWWA C-550.
- h. All exposed bolts, nuts, fasteners, and washers shall be Type 316 stainless steel and all buried bolts, nuts, fasteners, and washers shall be "Cor-Ten" steel or Cor-blue coated. Mechanical joints bolts shall not protrude more than ½ inch through the nut after joints are assembled. Accessories for the mechanical joint consisting of the gasket, gland and fasteners shall be

furnished and packaged separately from the valves. Each package shall be labeled in such a manner as to provide for proper identification and number of units per package or bundle.

- i. All stainless steel fasteners threads shall be coated with an anti-seize compound as approved by CCU.

2.1.1.3 Flanged Joints:

- a. Flanges shall be drilled in accordance with ANSI-B16.1 Class 150 Cast-Iron Flange Specifications. Flanges shall be machined to a flat face with a finish of 250 micro-inches AARRH maximum or machined to a flat surface with a serrated finish in accordance with AWWA Standards C-207, Section 6 for Steel Pipe Flanges. Flange gaskets shall be one-eighth inch ring type of a synthetic rubber material. All thread studs shall be used on all valve flange connections in accordance with ASTM Standard Designations A-307, Grade B, with heavy hex nuts.

2.1.1.4 Bolting Material:

- a. All exposed bolts, nuts, fasteners, washers, shall be Type 316 stainless steel and all buried bolts, nuts, fasteners, and washers shall be “Cor-Ten” steel or Cor-blue coated. Bolts and hex nuts used on the valve shall be the manufacturer's standard either fabricated from a low-alloy steel for corrosion resistance or electroplated with zinc or cadmium. The hot-dip process in accordance with ASTM Standard Designate A-153 is not acceptable for the threaded portion of the bolts and nuts.
- b. All stainless steel fasteners threads shall be coated with an anti-seize compound as approved by CCU.

2.1.1.5 Approved Products

All valves and tapping sleeves shall conform to AWWA standards and shall meet CCU standard details as determined by CCU.

The following product(s) are approved for valves:

AFC	2500-1 SERIES
Clow/M&H/Kennedy	4000 SERIES
Mueller	A 2360 SERIES
Clow	6100 SERIES
U.S. Pipe	METROSEAL 250

The following product(s) are approved for tapping sleeves:

JCM	432 SERIES
Romac	SST III SERIES
Cascade	CST/EX
Smith Blair	662, 663
Powerseal	3490MJ/3940AS

## 2.1.2 Plug Valves:

### 2.1.2.1 General

- a. Plug valves shall be used on 3” diameter to 12” diameter low pressure sewer systems force mains and force mains. Gate valves shall be used for all wet tapping of mains on low pressure sewer systems force mains and force mains.
- b. Valves and required operating appurtenances shall be the product of the same manufacturer. All plug valves shall have the manufacturer and size of the valve visibly cast on the body or on a plate attached to the body of the valve. Valve components shall withstand the environmental conditions in contact, and provide continuous trouble-free services. Valve seals shall be able to provide tight closure and prevent metal-to-metal contact.
- c. Plug valves 8 inch and larger in size require gear reduction actuators.

### 2.1.2.2 Manufacture

- a. Plug valves design, component material construction, manufacture, and testing shall be in accordance with AWWA C-504 and shall provide for nominal pipe size flow with no interference or restrictions. The plug valve body shall be of cast iron conforming to ASTM A-126, Class B, for working pressures up to 175 psi. The words “Seat End” shall be cast on the exterior of the body seat end. All below ground gear actuators for plug valves shall be operated by a standard 2" AWWA operating nut. For side mounted actuators, the actuators shall have a counter clockwise rotation operating nut. For above ground applications, stop-limiting devices shall be provided in the operators for the open and closed portions and valve operators shall be provided with position indicators to show the position of the valve disc or plug.
- b. Plug shall be of one-piece construction and made of ASTM A-124, grade B cast iron with a resilient facing per ASTM D2000-BG and AWWA C-504 requirements. The exterior of the plug valve shall be coated with a universal alkyd primer. Cover bolts shall be corrosion resistant with zinc plating.
- c. All plug valves shall be provided with a fully enclosed, permanently lubricated actuator of the worm gear design. The actuator shall be connected to the valve shaft by means of a key and keyway connection. Shaft seals shall conform to AWWA C-504 and consist of V-type packing in a fixed gland with an adjustable follower. Radial bearings shall be constructed of self-lubricating type 316 stainless steel. The top thrust bearing shall be Teflon, and the bottom thrust bearing shall be type 316 stainless steel.
- d. All interior ferrous surfaces of the valve, including the plug, shall be coated with fusion bonded epoxy, NSF 61 certified for use in potable water. The epoxy shall have a nominal thickness of 8 mils and be in accordance with AWWA C-550.

### 2.1.2.3 Valve Ends Installations

- a. Flanged ends (non-buried installation): Flanged fittings have 150 lb. flanges and shall be faced and drilled in accordance with ANSI Specification B16.1, Class 125.

- b. Mechanical Joint Ends (buried installation): Mechanical joint bell dimensions shall conform to AWWA C-111.

#### 2.1.2.4 Approved Products

All valves shall conform to AWWA standards and shall meet CCU standard details as determined by CCU.

The following product(s) are approved:

Milliken	600/601 Series
Pratt	Plug Valve
SPX Dezurick	100 Series

#### 2.1.3 Rubber-Seated Butterfly Valves

##### 2.1.3.1 General

Rubber-Seated Butterfly Valves shall only be used in specifically approved applications as per written CCU approval.

This section addresses class 150 rubber-seated butterfly valves, 3 inches through 72 inches. All products furnished shall be in conformance with the latest revision of American National Standards Institute and American Water Works Association C-504 Standard (ANSI/AWWA C-504) or latest revision thereof. All coatings in contact with potable water shall be certified to NSF 61. Valves shall be Class 150 of the short-body type with a 150 psig bi-directional shut-off rating. Valve shall be in the same alignment as a horizontal pipe and shall be for buried service, unless otherwise specified. Valve shall be configured with a horizontal valve shaft and a vertical actuator shaft with standard 2" AWWA operating nut. The actuator shall be side mounted.

##### 2.1.3.2 Manufacture

- a. The valve body shall be of cast iron conforming to ASTM Specification A-126, Class B with flat-faced flanged valve body ends in accordance with ANSI B16.1, Class 125. All valves shall conform to AWWA C-504, Table 2 of Section 3.1 Valve Bodies, laying lengths for flanged valves and minimum body shell thickness for all body types and AWWA C-509. The valve design shall be of such design that the disc will seat at 90 degrees with the pipe axis and the disc will not flutter or vibrate when operated in a throttled position.
- b. The valves disc shall be of Cast Iron A-48, class 40 Cast Iron A-126, class B or Ductile Iron ASTM A-536, grade 65-45-12 with a disc design to provide 360 degree uninterrupted seating. The valve seat shall be natural or synthetic rubber resilient seating applied integrally to the body or disc. For valves 24 inches or larger, the rubber seat shall be capable of mechanical adjustment in the field and shall be field replaceable. Special tools required for seat adjustment and replacement shall be furnished with the valve and the seat respectively. Mechanical adjustment or attachment of the seat and seat ring shall not include welding. The

mating seat surface shall be type 316 stainless steel. Sprayed or plate mating seat surfaces shall not be used.

- c. Valve shafts shall be type 304 stainless steel conforming to ASTM A-276 and shall have a diameter equal to or greater than that shown for Class 150B in Table 3 of AWWA C504. Shafts shall conform to the requirements of Section 3.3, Valves Shaft of AWWA C504 for one-piece or stub shaft types. Connection between the shaft and disc shall be dowel or taper pins, which are mechanically secured. The valve assembly shall be furnished with a factory-set, non-adjustable disc shaft thrust bearing that insures the valve disc is centered within the valve body seat at all times. Valve shaft bearings shall be permanent, self-lubricated bearings providing continuous, low-friction maintenance-free operation. Shaft bearing shall be contained in integral hubs of the valve body. Valve shaft seal shall consist of O-ring, V-type, or U-cup type packing where the shaft projects through the valve body for the actuator connection.
  
- d. The valve shall be provided with a fully enclosed, permanently lubricated actuator of the traveling nut or worm gear design. The actuator shall be connected to the valve shaft by means of a key and keyway connection. All actuators shall have adjustable, mechanical stop limits in accordance with AWWA C504 Section 3.8.2 and shall be capable of withstanding 450 ft-lbs of input torque against the open or closed stops without damage.
  
- e. Valves for below ground applications shall have an AWWA wrench nut with a cast-in arrow indicating the direction of opening. For a smooth shaft, the wrench nut shall be fastened to the input shaft by means of a minimum 5/16" diameter steel pin passing entirely through the shaft and the wrench nut; a key with keyway is acceptable. For a splined shaft, the wrench nut shall be formed to fit the splined shaft. The actuator shall be designed to produce the specified torque with a maximum input of 150 ft-lbs applied to the wrench nut. For aboveground valves, a hand wheel will be used with a cast-in arrow indicating the direction of the opening. The hand wheel shall be fastened to the actuator input shaft to produce the specified torque with a maximum pull of 80 pounds of the hand wheel rim.
  
- f. All interior and exterior ferrous surfaces of the valve, including the disc, shall be coated with fusion bonded epoxy, NSF 61 certified for use in potable water. The epoxy shall have a nominal thickness of 8 mils and shall be in accordance with AWWA C550 latest revision.

### 2.1.3.3 Approved Products

All valves shall conform to AWWA standards and shall meet CCU standard details as determined by CCU.

The following product(s) are approved:

Clow/M&H/Kennedy	4500 SERIES
Mueller	LINE SEAL

## 2.1.4 Check Valves

### 2.1.4.1 General

The in-line check valves shall be of the swing flex, full body, flanged type with a domed access cover; shall have only one moving part, the valve disc; and shall be fully operational when mounted in the vertical position.

### 2.1.4.2 Manufacture

- a. The valve body shall have full flow equal to nominal pipe diameter at any point through the valve. The seating surface shall be on a 45 degree angle to minimize disc travel. The top access port shall be full size to allow removal of the disc without removing the valve from the pipeline. The access cover shall be domed in shape to allow the disc to be fully operational in lines containing high solids content. The disc shall be of one piece precision molded construction with an integral O-ring type sealing surface and contain steel and nylon reinforcements in both the Memory Flex and central disc areas. Non slam closing characteristic shall be provided through a short 35 degree disc stroke and a Memory Flex disc return action. The valve body and cover shall be ASTM A-126, Class B cast iron. The disc shall be Buna-N (BNR), ASTM D2000-BG.
- b. The interior of the valve shall be fusion bonded epoxy coated NSF 61 certified for use in potable water, and the exterior shall be coated with a universal primer.

### 2.1.4.3 Approved Products

All valves shall conform to AWWA standards and shall meet CCU standard details as determined by CCU.

The following product(s) are approved:

Clow/M&H/Kennedy	C508/106LW
Mueller	A - 2600 SERIES
AFC	SERIES 2100

## 2.1.5 Air Release Valves

### 2.1.5.1 General

This section includes air release valves, automatic air release valves, and automatic combination air release/vacuum release valves that are to be used for potable water mains, reclaimed water mains, low pressure sewer system force mains and force mains as specified.

- a. Automatic water air release valves shall be used on potable water mains. Automatic wastewater air release valves shall be used on force mains, and low pressure sewer system force mains. The automatic air release valves shall be constructed in accordance with CCU standard details.

- b. Automatic wastewater air release valves installed on force mains and low pressure sewer system force mains shall include odor control in accordance with CCU standard details.
- c. Automatic Combination Air Release/Vacuum Release Valves shall be used for reclaimed water mains and shall include odor control and shall be constructed in accordance with CCU standard details.
- d. Automatic air release valves and automatic combination air release/vacuum release valves shall have a high density polyethylene enclosure blue in color for potable water mains, green in color for force mains and low pressure sewer system force mains, and purple in color for reclaimed water mains.
- e. The vacuum portion of the automatic combination air release/vacuum release valves shall be deactivated in all applications unless otherwise directed by CCU.

2.1.5.2 Manufacture

- a. Automatic air release valves and automatic combination air release/vacuum release valves shall be manufactured in accordance with AWWA C-512.
- b. Type 316 stainless steel shall be used for all internal components of automatic air release valves and automatic combination air release/vacuum release valves, unless otherwise approved by CCU.
- c. All automatic air release valves and automatic combination air release/vacuum release valves shall be fusion bonded epoxy coated and shall be certified to NSF 61 for use in potable water.

2.1.5.3 Approved Products

All valves shall conform to AWWA standards and shall meet CCU standard details as determined by CCU.

The following product(s) are approved:

ARI	D-025 (Sewage)
Valmatic	15A - 15A.3 (Water)
Valmatic	200 SERIES (Water Combo)

2.1.6 Valve Box and Valve Box Cover

2.1.6.1 Manufacture

- a. The valve box shall be in ductile iron material.
- b. The valve box cover shall be reinforced, high density polymer concrete including an ultraviolet (UV) inhibiting agent and a solid color throughout the cover.
- c. The valve box cover shall include a 3M read and write capable locater marker for the function of the valve.

- d. The valve box cover loading shall exceed the Tier-15 load rating in accordance with ANSI/SCTE 77. When installed, the top valve box cover shall be below the top rim/edge of the valve riser.
- e. The valve box cover shall meet the dimensions and marking requirements of the CCU standard details and include a three (3)” round brass identification plate to be inserted into the concrete valve pad. The identification plate shall include the valve size, date of installation, and number of turns as shown on the brass identification plate used on the valve pad.

#### 2.1.6.2 Approved Products

All valve boxes and valve box covers shall conform to ANSI/SCTE 77 and shall meet CCU standard details as determined by CCU.

The following product(s) are approved:

Valve box cover only: Glassmasters Polymer Concrete Products:

- Potable Water: Mfg Part # VBC7420-4-CCU
- Reclaimed Water: Mfg Part # VBC7420-2-CCR
- Wastewater: Mfg Part # VBC7420-5-CCWW
- Fire Hydrant: Mfg Part # VBC7420-6-CCH

Valve boxes only:

- General Foundry: #32461
- Sigma/Russco: B122
- Tyler/Union: 461S

### PART 3 - EXECUTION

#### 3.1 Construction Requirements

##### 3.1.1 General:

Handling, Storage, Protection and Delivery: Unloading, distribution, and storage of pipe and appurtenant materials on the job site shall be as approved by CCU. All materials shall be handled carefully to prevent damage to protective coatings, linings, and joint fittings; to preclude contamination of interior areas; and to avoid jolting contact and dropping or dumping.

##### 3.1.2 Valve Installation

- a. All below ground valves shall be installed with a 30” x 30” x 6” concrete valve pad including a brass identification tag, ductile iron riser, specified cap, with main designation, and extension if required, in accordance with CCU standard details.
- b. Installation shall conform to manufacturer's recommendations.

- c. The Contractor shall verify the existing utilities such as fittings and valves are restrained prior to the start of installation of the valve. If not restrained, the Contractor shall notify CCU in writing and shall restrain the existing utility as approved by CCU.
- d. The Contractor shall carefully clean the valves flanged faces and threaded ends of all foreign material, and inspect valves in open and closed positions. The contractor shall notify CCU and not install the valves if the valves do not function properly for the intended purpose. After cleaning flanges, the contractor shall insert the gasket and tighten the nuts progressively and uniformly. If flanges leak under pressure, the contractor shall loosen the nuts, reseal or replace the gasket, retighten the nuts, and retest the joints.
- e. Bolt holes of flanged valves shall straddle the centerline of the pipe run.
- f. All above ground valves shall be prepped, primed, and finish painted in accordance with the installed assembly and CCU standard specifications.
- g. The operating nut on a valve or extension bar shall be set between eighteen (18) and thirty (30) inches.
- h. All valves shall have a centering ring that sits below the operating nut of the valve and centers the valve in the middle of the valve box.

### 3.1.3 Valve Cap Color Coding Schedule

- a. Valve caps shall be color coded as per the following:

<u>Legend:</u>	<u>Color code:</u>
Wastewater cap	Green Pantone 341C
Potable water cap	Blue Pantone 287
Reclaimed water cap	Purple Pantone 522C
Fire hydrant cap	Safety Yellow

**END OF SECTION**