

## SECTION 52

### VALVES, HYDRANTS AND ACCESSORIES FOR WATER MAINS

#### **52.1 GENERAL**

All valves and appurtenances shall be products of well established firms who are fully experienced and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these SPECIFICATIONS as applicable.

#### **52.2 RESILIENT SEAT GATE VALVES**

##### 52.2.1 GENERAL

All gate valves twelve (12) inches and smaller shall be resilient seat gate valves. Such valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C509, latest revision, and in accordance with the following SPECIFICATIONS. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve. See approved manufacturers' list in appendix.

##### 52.2.2 MATERIAL

The valve body, bonnet, and bonnet cover shall be cast iron ASTM A126, Class B. All ferrous surface inside and outside shall have a fusion-bonded epoxy coating. A two (2) inch wrench nut shall be provided for operating the valve. All valves are to be tested in strict accordance with AWWA C509.

##### 52.2.3 MISCELLANEOUS REQUIREMENTS

The valves shall be non-rising stem with the stem made of cast, forged, or rolled bronze as specified in AWWA C509. Two (2) stem seals shall be provided and shall be of the o-ring type. The stem nut must be independent of the gate.

The resilient seating mechanism shall provide zero leakage at the water working pressure when installed with the line flow in either direction.

#### **52.3 BUTTERFLY VALVES**

##### 52.3.1 GENERAL

All shut-off valves fourteen (14) inches and larger shall be butterfly valves. Butterfly valves and operators shall conform to the AWWA Standard Specifications for Rubber Seated Butterfly Valves, Designation C504, except as hereinafter specified. Valves, except as specified hereinafter, shall be Class 150A or B. See approved manufacturers' list in appendix.

#### 52. 3. 2 MATERIAL

The valve body shall be constructed of close grain cast iron per ASTM A126, Class B or equivalent material. All retaining segments and adjusting devices shall be of corrosion resistant material. Valve seats shall be a natural rubber or synthetic rubber compound. Valve seats thirty (30) inches and larger shall be field adjustable and replaceable without dismounting operator disc or shaft and without removing the valve from the line. All retaining segments and adjusting devices shall be of corrosion resistant material. Valves twenty-four (24) inches and smaller shall have bonded or mechanically restrained seats as outlined in AWWA C504.

#### 52. 3. 3 FACE TO FACE DIMENSION

The face-to-face dimensions of valves shall be in accordance with above mentioned AWWA Specification for short-body valve.

#### 52. 3. 4 VALVE SHAFT

The valve shaft shall be turned, ground, and polished constructed of 18-8 stainless steel and designed for both torsional and shearing stresses when the valve is operated under its greatest dynamic or seating torque. Shaft shall be of either a one piece unit extending full size through the valve disc and valve bearing or it may be of a stub shaft design.

#### 52. 3. 5 VALVE OPERATOR

In general, the butterfly valve operators shall conform to the requirements of AWWA Standard Specifications for Rubber Seated Butterfly Valves, Designation C504, insofar as applicable.

### **52. 4 VALVE INSTALLATION**

All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the CITY before they are installed.

Valves shall be installed in a vertical position and be provided with a standard valve box so arranged that no shock will be transmitted to the valve. The box shall be vertically

centered over the operating nut, and the cast iron box cover shall be set flush with the road bed or finished surface.

After installation, all valves shall be subjected to the field test for piping as outlined in Section 51 of these specifications. Should any defects in materials or workmanship appear during these tests, the CONTRACTOR shall correct such defects to the satisfaction of the CITY.

Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All buried bolts and nuts shall be heavily coated with two (2) coats of bituminous paint.

## **52.5 VALVE BOXES**

All buried valves shall have cast-iron three piece valve boxes. Valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at or slightly above the finished grade surface as directed by the CITY. The barrel shall be two-piece, sliding type, having five and one-quarter (5 $\frac{1}{4}$ ) inch shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall have "WATER" cast into the top for all water mains. The actuating nuts for deeper valves shall be extended to come up to four (4) foot depth below finished grade.

Care shall be taken while constructing valve boxes to ensure that valve stems are vertical and the cast iron box has been placed over the stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. CONTRACTOR shall remove any sand or undesirable fill from valve box prior to final inspection.

## **52.6 AIR RELEASE VALVES**

The air release valves for use in water mains shall be installed as shown on the STANDARD DRAWINGS. The valves shall have a cast iron body, cover and baffle, stainless steel float, bronze water diffuser Buna-N or Viton seat and stainless steel trim. Valves shall be provided with a vacuum check to prevent air from reentering the line. The fittings shall be threaded.

## **52.7 FIRE HYDRANTS**

### **52.7.1 MATERIAL**

Fire hydrants shall have five and one-quarter (5 $\frac{1}{4}$ ) inch valve opening and shall comply with AWWA Standard C502 for fire hydrants for water works service, unless in conflict with MANUAL in which case this manual shall apply. Each hydrant shall have six (6) inch mechanical joint ends with harnessing lugs (dog-ears) and shall open by turning to the left (counter-clockwise). Fire hydrant

shall be of ample length for three and one-half (3½) foot depth of bury. It shall be provided with two (2) two and one-half (2½) inch hose nozzles and one (1) four and one-half (4½) inch pumper nozzle, all having National Standard hose threads. Nozzles shall have caps attached by chains. Operating nuts shall be AWWA Standard (pentagonal, measuring one and one-half [1½] inch point to flat). Fire hydrants shall be equipped with "O-Ring" packing. (See approved manufacturers' list in appendix.)

#### 52. 7. 2 PAINTING

All iron parts of the hydrant both inside and outside shall be painted, in accordance with AWWA C-501. All inside surfaces and the outside surfaces below the ground line shall be coated with asphalt varnish. They shall be covered with two (2) coats, the first having dried thoroughly before the second is applied.

The outside of the hydrant above the furnished ground line shall be thoroughly cleaned and thereafter painted with one (1) coat of paint of a durable composition, and one (1) additional coat of "Traffic Yellow" paint.

#### 52. 7. 3 CONSTRUCTION DETAILS

Hydrants shall be plumb and shall be set so that the lowest hose connection is, at least, eighteen (18) inches above the surrounding finished grade. All hydrants shall be inspected in the field upon delivery to the job to insure proper operation before installation. The resetting of existing hydrants and moving and reconnecting of existing hydrants shall be handled in a manner similar to a new installation. Hydrant shall be constructed in accordance with the STANDARD DRAWINGS.

#### 52. 7. 4 LOCATION

Fire hydrants shall be located in the general location as shown on the DRAWINGS. Final field location of all hydrants shall be as approved by the CITY. All hydrants shall be located no less than five (5) and no more than ten (10) feet from the edge of pavement of the adjacent roadway and no less than five (5) feet from any physical feature which may obstruct access or view of any hydrant unless otherwise approved by the CITY.

#### 52. 7. 5 REFLECTIVE PAVEMENT MARKERS

The CONTRACTOR will place blue reflective pavement markers two (2) feet from the edge of the pavement closest to the hydrant. Pavement markers shall be installed properly to ensure against being dislodged by normal traffic.