SECTION 33 12 19

FIRE HYDRANTS

(Sentences and/or paragraphs that are double underlined indicate revisions that were made from the 2009 specification.)

PART 1 - GENERAL

1.1 DESCRIPTION

This section describes the manufacture, construction, and installation of fire hydrants.

1.2 MEASUREMENT AND PAYMENT

A. FIRE HYDRANTS

Fire hydrants will be measured by the each as shown on the plans.

Payment will be made at the unit price bid per each for furnishing and installing fire hydrants, which bid price will include all costs for the fire hydrant installation, (excluding TEE), hydrant piping and fittings, hydrant gate valve, extension stems, valve boxes, concrete blocking, testing, disinfection, and all other work not otherwise provided for in the Proposal. The main line fitting is not included in the cost of the fire hydrant.

B. APPURTENANCES

Operation extensions, valve boxes, gate valves, mainline fittings, hydrant piping and fittings, anchor couplings, and concrete blocking will not be measured items and shall be considered subsidiary.

1.3 SUBMITTALS

A. Submit manufacturer's data on fire hydrants to be furnished indicating compliance with the specifications especially regarding dimensions, materials of construction, and nozzle threads.

B. Submit manufacturer's "Certificate of Compliance" stating that the materials furnished comply with the specifications.

C. Upon request, flow data, indicating friction loss in PSI at the flow of 1,000 GPM from the pumper nozzle, such friction loss must not exceed 3 PSI. ISO 9001 certification.

PART 2 – PRODUCTS

2.1 APPLICABLE STANDARDS

A. AWWA –C110, C111, C502, and C600

B. ASTM – C33 and C105

2.2 GENERAL

All fire hydrants furnished shall conform to the requirements and test of AWWA C502-94 Standard for Dry Barrel Fire Hydrant or latest version thereof, as they pertain to the design, component materials, construction and manufacture, except as modified or supplemented hereinafter. Fire hydrants shall have a published warranty against defects in material or workmanship for a period of ten (10) years from date of manufacture.

Fire hydrants shall come equipped with Storz quarter turn pumper connections that are an integral part of the fire hydrant and must be furnished by the manufacturer. Storz adapters will not be accepted. The nozzles and the caps for the nozzles shall meet the applicable requirements of NFPA 1963. Acceptable fire hydrants for the City of Bryan shall be American Flow Control 5-1/4" B-84-B-5 and M&H Fire Hydrant Style 129. Acceptable fire hydrants for the City of College Station shall be American Flow Control 5-1/4" B-84-B-5 and Clow Medallion.

1. Pressure rating -- working pressure shall be 250 psig tested to 500 psig hydrostatic pressure.
2. Flow -- friction loss shall not exceed 3.0 psig at a flow of 1000 gpm through the pumper nozzle connection when tested as prescribed in AWWA C-502 latest revision. This test must be conducted by an independent laboratory in their facility and attested to by a Professional Engineer. Documentation must accompany all requests for hydrant approval.
3. Drain valve -- must drain the barrel when the hydrant is closed, and seal shut when hydrant is opened.
4. Seat ring and Drain ring (show bushing) – must be bronze (ASTM B-62), shall work in conjunction to form an all bronze drain way, and shall have no less than two (2) openings. If they are in a cast iron shoe, they must be bronze lined and the bronze seat ring must thread into bronze drain ring (or shoe bushing) providing bronze to bronze connection. Seat rings must be "O" rings. The 6" shoe connection must be specified (flanged, A/C, M.J, etc.) having ample blocking for sturdy setting. A minimum of eight (8) bolts and nuts is required to fasten the shoe to the lower barrel.
5. Main valve – compression type closing with the pressure and must be not less than 5- 1/4" in diameter. Composition of the main valve must be molded rubber or neoprene, having a durometer hardness of 95 (+) (-) 5 and must be not less than 1" thick.
6. Outlet – "Three-way" having two (2) 2-1/2" hose nozzles and one (1) 4-1/2" I.D. pumper nozzle; all National Standard Hose Coupling Thread. All nozzles shall be bronze and thread counter clockwise into the nozzle section with "O" ring pressure seals and held in place with an acceptable locking device
7. Hydrant barrel casting – inside diameter of the hydrant barrel shall not be less than six and one-eighth inches (6-1/8").
8. Operating nut – Non-rising, pentagonal in shape, measuring 1-1/2" from point to flat at base of nut; bronze.
9. Hold-down nut – Shall incorporate an integral resilient weather seal and open counter clockwise.
10. Lubrication chamber - Must be provided with sealed top and bottom "O" rings, filled with lubricant which shall be either oil or grease, designed with thrust collar and threaded operating parts that are automatically lubricated each time the hydrant is cycled. There must not be less than two (2) "O" rings separating the lubrications reservoir from the waterway and that portion of the stem contracting these "O" rings shall be sleeved with bronze. An anti-friction device must be in place above the trust collar to further minimize operating torque.
11. Hydrant bonnet – must be attached to the upper barrel by not less than four (4) bolts and nuts, with an inserted flat rubber gasket as a pressure sea.
12. Direction to open – counter clockwise.

13. Operating stem – must be two-piece, not less than 1-1/4" diameter or 1" x 1" square (excluding threaded or machined areas) and must be connected by a breakable stem coupling near the ground line flange. Screws, pins, bolts or fasteners used in conjuction with the stem coupling must be stainless steel.

14. Exterior paint – red machinery enamel.

B. ADDITIONAL REQUIREMENTS

1. Breakable Type Construction

Hydrants shall be traffic-model type having upper and lower barrels joined approximately two inches (2") above the ground line by a separated and breakable "swivel" flange providing 360 degree rotation of the upper barrel for proper nozzle facing. This flange must employ not less than eight (8) bolts.

2. Provisions for Extension

All hydrants shall be capable of being extended to accommodate future grade changes without excavation. Compression type hydrants that close with the flow shall have breakable type stem coupling installed at the ground line flange. Extension of this type hydrant shall be made by adding at the ground line flange, a new coupling and stem section equal to the length of the extension. Stem extensions made by adding a new section of stem to the threaded section of the stem at the top of the hydrant will not be accepted. Only one extension is allowed.

3. Bury Length

Furnish hydrants for a four (4') foot bury unless the water line grades shown on the plans indicate a deeper bury is required.

4. Operating Stems

Operating stems whose threads are located in the barrel or waterway shall be of manganese bronze, Everdur, or other high quality non-corrodible metal, and all working parts in the waterway shall be bronze to bronze.

Operating stems whose threads are not located in the barrel or waterway may be made of high-grade bronze, genuine wrought iron, or steel, and stem nuts shall be bronze. Iron or steel stems shall have a bronze, stainless steel, or other non-corrodible metal, sleeve where passing through "O"-rings. Operating threads must be sealed against contact with the water at all times regardless of open or closed position of the main valve.

The operating mechanism, safety stem coupling and main valve assembly shall be capable of withstanding 200 ft-lbs of torque against the fully open or closed positions, with no damage to the components. Downward stem travel shall be limited in the bottom of the hydrant by a one-piece lower valve plate that bottoms out in the hydrant shoe. Travel stops located in the bonnet or upper valve plate is unacceptable. The interior and the exterior of the hydrant shoe shall be fully coated with not less than 8 mils of fusion bonded epoxy.

5. Main Valve Seats

Main valve seats on compression type hydrants closing with the flow shall be of such design that incorrect positioning is impossible and that the threads will be adequately guided into position. Arrangements shall also be made to hold the main valve gasket in place during assembly. The main seat shall be made of bronze and threaded into a heavy bronze bushing in the hydrant base.

6. Seat and Drain Ring

   The bronze seat shall thread directly into a bronze drain ring. This will assure easy removal of the main valve seat through the top of the hydrant shoe and all pressure seals must be ”O”-rings.

7. Hydrant Heads

   The hydrant shall be constructed so that the nozzles may be faced in any desired direction.

8. Mating Surfaces

   All mating surfaces, such as bonnet-to-nozzle section, nozzle section-to-lower barrel, lower barrel-to-shoe, must utilize rubber gaskets for sealing and must be held in place by zinc-plated bolts and nuts. Other methods, such as snap rings, etc., will not be accepted.

9. Manufacturer Experience Record

   No hydrant will be considered which has not been regularly manufactured and in successful continuous use for at least 10 years.

C. ACCESSORIES REQUIRED

1. Full face ground line flange gaskets.
2. Nozzle cap gaskets
3. Drain valve and outlet
4. Cap nuts to seal the bottom end of stem threads against contact with water
5. Harnessing lugs (Required only when shown on the plans.)

2.2 TESTING REQUIREMENTS

See SECTION 33 13 10 – HYDROSTATIC TESTING and SECTION 33 13 00 – DISINFECTION OF WATERLINES.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

A. Fire hydrant leads 18’ or shorter will be restrained the entire length. Fire hydrant leads shall require a separate valve for the fire hydrant assembly. If main line valve is within 50’ of fire hydrant, then assembly valve may be omitted on a dead end hydrant lead with no additional connections.

B. Place fire hydrants at all locations shown on the plans, or as directed by the Engineer.

C. Set each fire hydrant upon a concrete slab not less than four inches (4”) thick and not less than one (1) square foot of surface area.

D. Place eight (8) cubic feet of crushed rock, clean gravel or other suitable material to provide reservoir capacity so that the hydrant will completely drain when closed.

E. Set the hydrant perpendicular with large steamer nozzle facing nearest curb, and at a depth such that the center of the steamer nozzle is not less than eighteen inches (18”), nor more than twenty-four inches (24”) above nearest grade. Assure that the hydrant is sat at the bury line.

F. Contractor shall remove the chains from the steamer nozzles prior to final project inspection.

G. Polyethylene encasement of 8 mils thick shall be installed on all piping and appurtenances in contact with soil and shall conform to AWWA C105. Joint tape shall be self sticking PVC or polyethylene, 8 mils thick.

END OF SECTION