SECTION 02645

FIRE HYDRANT ASSEMBLY

PART 1 G E N E R A L

1.01 SECTION INCLUDES

A. Fire hydrants.

1.02 UNIT PRICES

A. Measurement is on a lump sum basis for each fire hydrant assembly installed. Fire hydrant assembly includes the fire hydrant and gate valve and box as shown on the standard details.

B. Measurement for fire hydrant branches (leads) is on a linear foot basis for each branch installed measured from the main to the gate valve. Separate payment will be made for open cut and augered branches.

C. Measurement for removing and salvaging of fire hydrants is on a lump sum basis for each fire hydrant removed. This includes removing hydrant and valve if available, plugging branch line and removing materials from site. Return salvage fire hydrants to Owner.

1.03 SUBMITTALS

A. Submit product data in accordance with all provisions and sections of these specifications.

1. Control drawing(s) for proposed hydrant: Include model number, parts list, and material specifications, unique drawing number and descriptive legend

identifying hydrant. Such drawing(s) should be same as approval drawing(s) on file with the Owner.

2. Material safety data sheets for lubricants.

3. Affidavit of compliance for coating materials.

4. Certified hydraulic performance test report for proposed hydrant.

PART 2 P R O D U C T S

2.01 HYDRANT MATERIALS

A. Hydrants: AWWA C502; dry barrel design; tamper resistant; same manufacturer throughout project.

1. "O" Ring Seal Packing: Prevent water leakage between barrel and lubrication chamber. Provide dynamic seals of Buna "N" or other oil resistant material and static seals of Buna "N" or other approved synthetic rubber.

2. Bronze: Hydrant components in waterway to contain not more than 15 percent zinc and not more than 8 percent lead.

3. Acceptable Manufacturer: Mueller Super Centurian 250, EJ Watermaster 5CD250, Kennedy Guardian K81-D or approved equal.

B. Operating Stems: Everdur, or other high-quality non-corrodible metal where threads are located in barrel or waterway. Bronze-to-bronze working parts in waterway; genuine wrought iron or steel where threads are not located in barrel or waterway, bronze bushed at penetration of stuffing box; seal threads against contact with water regardless of open or closed position of main valve. Connect operating stems with breakable coupling.

C. Main Valve (shut-off valve): Circular; compression-type; closes with line pressure; minimum opening of 5-1/4 inches in diameter. Seal bottom end of stem threads from contact with water with cap nut.

D. Valve Mechanism: Bronze valve seat ring threaded into bronze drain ring; seat ring and main valve assembly removable from above ground through upper barrel with lightweight seat removal wrench; breakable stem coupling opposite barrel breakaway; bronze or corrosion-resistant pins and locking devices; bronze valve stem sleeve, O-ring seals and travel stop; sealed lubricating reservoir at top and bottom which fully lubricates threads and bearing surfaces when opening or closing main valve; thrust bearing or lubricated thrust collar for operating assembly. Lubricants: Food Grade.

Valve Seat: Molded "Natural" rubber; scale durometer rating of 90±5; minimum thickness of 1/2 inch. Natural Rubbers: Resistant to microbiological attack.

E. Lower Hydrant Barrel: Single piece coupled to upper barrel to allow 360-degree rotation of upper barrel. Bury Length: Distance from bottom of inlet to ground line as specified. Ground Line: Clearly marked on barrel. Indicate inside diameter and wall thickness (with tolerances) for upper barrel, lower barrel, and bonnet sections. Show dimensions at minimum sections to demonstrate compliance with Paragraph 3.2.6 of AWWA C502.

F. Extensions: Permit use of one or more standard extensions available from manufacturer in lengths from 6 inches to 60 inches in 6-inch increments.

G. Provide hydrants with automatic, positively operating, non-corrodible drain or drip valve to drain hydrant completely when main valve is shut. Bronze or corrosion resistant drain line. Tapping of drain holes is not required.

H. Inlet Connection: Elbow with AWWA Standard bell designed for 6-inch mechanical joint, or push-on. Joints: ANSI A21.11; AWWA C111.

I. Operating Nut and Hold-down Nuts: Stainless steel or cast or ductile iron with bronze inserts or, as an alternative, provide security device with bronze operating nut. Any such security devices shall not require special tools for normal off/on operation of hydrant. Fabricate hold-down assemblies of suitable metallic materials for service intended.

J. Field-Replaceable Nozzles: NFPA No. 194, ANSI B26-1925; mechanically attached to hydrant body counterclockwise; sealed with "O" rings and mechanically located into place; provide two hose nozzles with 2-1/2 inch nominal inside diameter and one pumper nozzle with 4-inch nominal inside diameter; with Storz connections.

K. Pumper Nozzle: Allow a minimum unobstructed radius of 10 inches from threaded surface of nozzle throughout path of travel of wrench or other device used to fasten hose to nozzle.

L. Nozzle Caps: Security chains to hydrant barrel, minimum 1/8-inch diameter; "Natural" rubber or neoprene gasket seals.

M. Hydrant shoe with 6-inch cast or ductile iron pipe diameter inlet, flanged, swivel or slip joint with harnessing lugs for restrained joints. Underground flanging shall incorporate

minimum of six full 3/4-inch diameter electro-galvanized or cadmium coated steel bolts or four 5/8-inch diameter stainless or cadmium coated steel bolts.

N. Provide traffic model hydrants equipped with safety flange on hydrant barrel and stem. Equip body of hydrant with breakable flange, or breakable bolts, above finish grade.

O. Lubricate hydrants with food grade oil or with grease meeting requirements of FDA 21 CFR 178.3570 and manufactured with FDA approved oxidation inhibitors.

P. Accomplish replenishment of lubricant for hydrant working parts without removing hydrant bonnet. Store lubricant system in reservoir. Lubricate bearing surfaces and working parts during normal operation of fire hydrant.

Q. Hydrant Painting: Shop coated as follows:

1. Exterior Above Traffic Flange (including bolts and nuts)

a. Surface Preparation: SSPC-SP10 (NACE 2); near white blast cleaned surface.

b. Coat with a three (3) coat alkyd/alkyd/silicone alkyd system with a total dry film thickness (DFT) of 6 - 9 mils as follows:

(1). Prime Coat : Oil Modified Alkyd Primer, Acro Products No. 1104, Heavy Duty Tank & Steel Primer, or approved equal; SSPC Paint Specification No. 25. Total dry film thickness (DFT): 2 - 3 mils.

(2). Intermediate Coat: Heavy Duty Industrial Alkyd Enamel, Acro Products No. 2214, or approved equal; SSPC Paint Specification No. 104; Federal Standard FF-E-489. Total dry film thickness (DFT): 2 - 3 mils.

(3). Finish Coat: Silicone Alkyd Resin Enamel, Acro Products No. 2215 or approved equal; SSPC Paint Specification No. 21. Total dry film thickness (DFT): 2 - 3 mils. Exception: hydrant bonnet shall not be finish shop coated - only intermediate coated. Finish coating shall be field applied and color coded when installed in

accordance with the following values that can be obtained from the City's Fire Marshalls office:

Flow rate greater than 1500 gpm: Light Blue

Flow rate from 1000-1499 gpm: Green

Flow rate from 500-999: Orange

Flow rate less than 500: Red

(4). Colors: Primer: Manufacturers standard color. Finish coat of hydrant body: Red (Acro 555 crystal blue or equivalent).

2. Exterior Below Traffic Flange:

a. Surface Preparation: SSPC-SP10 (NACE 2); near white blast cleaned surface.

b. Coat with a three (3) coat system as follows:

(1). Primer and Intermediate Coat: Cal tar epoxy, Acro Products No. 4467, or approved equal; SSPC Paint Specification No. 16. Apply two (2) coats with a dry film thickness (DFT) of 8 - 10 mils each for a total dry film thickness (DFT) of 16 - 20 mils.

(2). Finish Coat: Water based vinyl acrylic mastic, Acro Products No. 7782, or approved equal. Apply one (1) coat with a dry film thickness (DFT) of 6 - 8 mils. Finish coat color: Same as finish coat for exterior above traffic flange, i.e. red (Acro 555 crystal blue or equivalent).

3. Interior Surfaces Above and Below Main Valve:

a. All materials used for internal coating of hydrant interior ferrous surfaces must conform to ANSI/NSF Standard 61 as suitable for contact with potable water as required by Chapter 290, Rules and Regulations for Public Water Systems, Texas Commission on Environmental Quality (TCEQ).

b. Surface Preparation: SSPC-SP10 (NACE 2); near white blast cleaned surfaces.

c. Coating: Liquid or powder epoxy system; AWWA Standard C550, latest revision. Coating may be applied in two (2) or three (3) coats,

according to manufacturers recommendations, for a total dry film thickness (DFT) of 12 - 18 mils.

4. General Coating Requirements:

   a. Coatings: Applied in strict accordance with manufacturer's recommendations. No requirements of this specification shall cancel or supersede written directions and recommendations of specific manufacturer so as to jeopardize integrity of applied system.

   b. Hydrant supplier shall furnish an affidavit of compliance that all materials and work furnished complies with requirements of this specification and applicable standards referenced herein.

2.02 HYDRANT PERFORMANCE STANDARDS

A. Hydraulic Performance Standards:

1. Provide hydrants capable of a free discharge of 1500 gpm or greater from single pumper nozzle at a hydrant inlet static pressure not exceeding 20 PSIG as measured at or corrected to hydrant inlet at its centerline elevation.

2. Provide hydrants capable of a discharge of 1500 gpm or greater from single pumper nozzle at a maximum permissible head loss of 8.0 psig (when corrected for inlet and outlet velocity head) for an inlet operating pressure not exceeding 37 psig as measured at or corrected to hydrant inlet at its centerline elevation.

B. Hydraulic Performance Testing: AWWA C502; conduct certified pressure loss and quantity of flow test by qualified testing laboratory on production model (5-foot bury

length) of hydrant (same catalog number) proposed for certification. Submit certified test report containing following information:

1. Date of test, no more than five years prior to date of proposed use, on fire hydrant with similar hydraulic characteristics.

2. Name, catalog number, place of manufacture, and date of production of hydrant(s) tested.

3. Schematic drawing of testing apparatus, containing dimensions of piping elements including:

    a. Inside diameter and length of inlet piping.

    b. Distance from flow measuring points to pressure measurement point.

    c. Distance from flow and pressure monitoring points to hydrant inlet.

    d. Distance from pressure monitoring point to nozzles.

    e. Inside diameter and length of discharge tubing.

4. Elevation of points of measurement, inlet, and

5. Reports, or certificates documenting accuracy of measuring devices used in test.

6. Conduct test on at least three separate hydrants of same fabrication design. Inlet water temperature: 70 degrees F ± 5 degrees F.

C. Provide hydrants equipped with breakable barrel feature and breakable valve stem coupling such that vehicular impact will result in clean and complete break of barrel

and valve stem at breakable feature. Provide hydrant shutoff valve which remains closed and tight against leakage upon impact.

2.03 LEADS

A. Branches (Leads): Conform to requirements of Section 02610 - Ductile-Iron Pipe and Fittings, Section 02611 - Steel Pipe and Fittings, and Section 02620 - PVC Pipe.

B. Mains 8" and above in size will require an 8" lead to hydrants. Mains under 8" will require a 6" lead to hydrants.

PART 3 E X E C U T I O N

3.01 INSTALLATION

A. Set fire hydrant plumb and brace at locations and grades as shown on Drawings. When barrel of hydrant passes through concrete slab, place a piece of standard sidewalk expansion joint material, 3/4 inch thick, around section of barrel passing through concrete.

B. Locate nozzle centerline minimum 18 inches and a maximum of 24" above finish grade.

C. Place 12-inch x 12-inch yellow indicators (plastic, sheet metal, plywood, or other material approved by Owner's Representative) on pumper nozzles of new or relocated fire hydrants installed on new mains not in service. Remove indicators after new main is tested and approved by Owner's Representative.

D. Do not cover drain ports when placing concrete thrust block.

E. All changes in profile from approved plans due to obstructions not shown on plans which require a change in depth of bury of fire hydrant shall be approved in writing by Owner's Representative for design prior to installation of hydrant. Any adjustment required in flow line of water main or to barrel length of fire hydrant shall be incidental to unit price of fire hydrant and no separate payment shall be made for such adjustments.

F. Remove and dispose of fire hydrants shown on Drawings as per paragraph 1.02 C.

G. Owner may, at any time prior to or during installation of hydrants for a specific project, randomly select a furnished hydrant for disassembly and laboratory inspection, at Owner's expense, to verify compliance with Owner's requirements. If such hydrant is

found to be non-compliant, replace at Contractor's expense, all or a portion of furnished hydrants with hydrants that comply with Owner's requirements.

H. Install branches (leads) in accordance with Section 02664 - Water Mains.

END OF SECTION