

Section 02514**FIRE HYDRANT ASSEMBLY****1.0 GENERAL****1.01 SECTION INCLUDES**

- A Fire hydrants.
- B References to Technical Specifications:
 - 1. Section 01200 – Measurement and Payment Procedures
 - 2. Section 01350 – Submittals
 - 3. Section 02634 – Ductile Iron Pipe and Fittings
 - 4. Section 02635 – Steel Pipe and Fittings
 - 5. Section 02534 – PVC Pipe
 - 6. Section 02510 – Water Mains
- C Referenced Standards:
 - 1. National Fire Protection Association (NFPA)
 - 2. American Water Works Association (AWWA)
 - 3. American National Standards Institute (ANSI)
 - 4. National Association of Corrosion Engineers (NACE)
 - 5. Food and Drug Administration (FDA)
 - 6. Steel Structures Painting Council (SSPC)
 - 7. Texas Commission on Environmental Quality (TCEQ)
 - 8. National Sanitation Foundation (NSF)

1.02 MEASUREMENT AND PAYMENT

- A Measurement for installation of fire hydrants is on a per each basis, complete in place. Payment includes all valves, fittings, bedding, backfill, and thrust blocking required for the installation of the fire hydrant assembly.
- B If fire hydrant leads are included as a Bid Item, measurement will be on a linear foot basis. Separate payment will be made for open cut and augered leads.
- C Measurement for removing and salvaging of fire hydrants is on a per each basis. Payment includes removing hydrant and valve if available, plugging lead, and removing materials from site or returning salvaged fire hydrants to Owner.
- D Refer to Section 01200 – Measurement and Payment Procedures.

1.03 SUBMITTALS

- A Make Submittals required by this Section under the provisions of Section 01350 – Submittals.

1. Shop drawing(s) for proposed hydrant: Include model number, parts list, and material specifications, unique drawing number and descriptive legend identifying hydrant.
2. Material safety data sheets for lubricants.
3. Affidavit of compliance for coating materials.
4. Certified hydraulic performance test report for proposed hydrant.

2.0 PRODUCTS

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, American Darling B-84-B, or East Jordan Iron Works WaterMaster 5CD250.
- 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° 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, restrained push-on, or flanged joint and valves. Flanged ends shall comply with ANSI/ASME B16.1, class 125 flanges. 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 4.492" nominal inside diameter; National Standard Threads; lock in place with security device.
- 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 stainless steel bolts or four 5/8-inch diameter stainless steel bolts. All bolts and nuts shall be stainless steel.
- 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 Lubricants: Food grade oil or grease meeting requirements of FDA 21CFR178.3570 and manufactured with FDA approved oxidation inhibitors.

- P Hydrant Painting:
 1. COLOR CODE (BONNETS)

Main Size	
6" and less	Gloss White Code No 225A120
8"	Safety Orange Code No 225A122
10" and 12"	John Deere Green Code No 225A133
16" and 20"	John Deere Yellow Code No 225A138
22" and up	Safety Red Code No 225A123

2. COLOR CODE

Fire Hydrant Barrel	Safety Blue Code No 225A120
Fire Hydrant Caps	(Same as Bonnet Color)

Q 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. Fire hydrants shall be power coated with zinc rich primer followed by a polyester powder coating of 10 to 12 mils, shall meet all the requirements of ANSI/AWWA C-550 (latest edition) and AAMA 2604.
2. Exterior Below Traffic Flange:
 - a. Surface Preparation: SSPC-SP10 (NACE 2); near white blast cleaned surface.
 - b. Fire hydrants shall be power coated with zinc rich primer followed by a polyester powder coating of 10 to 12 mils, shall meet all the requirements of ANSI/AWWA C-550 (latest edition) and AAMA 2604.
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 TCEQ, Chapter 290, Subchapter D: Rules and Regulations for Public Water Systems.
 - b. Surface Preparation: SSPC-SP10 (NACE 2); near white blast cleaned surfaces.
 - c. Coating: Powder coating in accordance with manufacturer's recommendation.
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 reports, or certificates documenting accuracy of measuring devices used in test.
 5. Conduct test on at least three separate hydrants of same fabrication design. Inlet water temperature: $70^{\circ} \text{ F} \pm 5^{\circ} \text{ F}$.
- 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 02634 – Ductile-Iron Pipe and Fittings, Section 02635 – Steel Pipe and Fittings, Section 02534 – PVC Pipe, and section 02532W - HDPE.

3.0 EXECUTION

3.01 INSTALLATION

- A Set fire hydrant plumb and brace at locations and grades as shown on Plans. When barrel of hydrant passes through concrete slab, place a piece of standard sidewalk expansion joint material, $\frac{3}{4}$ inch thick, around section of barrel passing through concrete.
- B Locate nozzle centerline minimum 18 inches above finish grade.
- C Place 12-inch x 12-inch yellow indicators (plastic, sheet metal, plywood, or other material approved by Engineer) 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 Engineer.
- D Do not cover drain ports when placing concrete thrust block.
 - E Lubricate hydrants with food grade oil or with grease meeting requirements of FDA 21CFR178.3570 and manufactured with FDA approved oxidation inhibitors.
 - F 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.
 - G 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 Engineer 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.
 - H Remove and dispose of or salvage fire hydrants shown on Plans.
 - I 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.
 - J Install leads in accordance with Section 02510 – Water Mains.

END OF SECTION