

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe, fittings, valves, and connections for sprinkler systems.

1.2 RELATED REQUIREMENTS

- A. Section 099000 - Painting and Coating: Preparation and painting of fire protection piping systems.
- B. Section 210553 - Identification for Fire Suppression Piping and Equipment: Piping identification.
- C. Section 211300 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.

1.3 REFERENCE STANDARDS

- A. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2007.
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; The American Society of Mechanical Engineers; 2005.
- C. ASME B16.3 - Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998 (R2006).
- D. ASME B16.4 - Gray Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998 (R2006).
- E. ASME B16.9 - Factory-made Wrought Steel Buttwelding Fittings; The American Society of Mechanical Engineers; 2007.
- F. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2005) (ANSI B16.18).
- G. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2007.
- H. ASTM A795/A795M - Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use; 2008.
- I. ASTM B 75 - Standard Specification for Seamless Copper Tube; 2002.
- J. ASTM B75M - Standard Specification for Seamless Copper Tube (Metric); 1999 (Reapproved 2005).

- K. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2009.
- L. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2005.
- M. AWS A5.8/A5.8M - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society; 2004 and errata.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2010.
- O. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; American Water Works Association; 2005 (ANSI/AWWA C105/A21.5).
- P. AWWA C110/A21.10 - American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (75 mm Through 1200 mm), for Water and Other Liquids; American Water Works Association; 2008.
- Q. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2007 (ANSI/AWWA C111/A21.11).
- R. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; 2009 (ANSI/AWWA C151/A21.51).
- S. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2010.
- T. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.
- U. UL 262 - Gate Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
- V. UL 312 - Check Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- C. Operation and Maintenance Data: Include installation instructions and spare parts lists.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Valve Stem Packings: Two for each type and size of valve.

1.5 QUALITY ASSURANCE

- A. Conform to UL and FM requirements.
- B. Valves: Bear UL label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- C. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers, with labelling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 PRODUCTS

2.1 FIRE PROTECTION SYSTEMS

- A. Sprinkler Systems: Conform work to NFPA 13.
- B. Welding Materials and Procedures: Conform to ASME Code.

2.2 BURIED PIPING

- A. Steel Pipe: ASTM A 53/A 53M Schedule 40 or ASTM A 795 Standard Weight, black, with AWWA C105 polyethylene jacket, or double layer, half-lapped polyethylene tape.
 - 1. Steel Fittings: ASME B16.9, wrought steel, buttwelded; with double layer, half-lapped polyethylene tape.
 - 2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings.
 - 3. Joints: Welded in accordance with AWS D1.1.
 - 4. Casing: Closed glass cell insulation.
- B. Copper Tube: ASTM B 75 (ASTM B 75M) or ASTM B 88 (ASTM B 88M), O60 or O50 temper.
 - 1. Type: Type K (A).
 - 2. Fittings: ASME B16.18, cast copper alloy, solder joint, pressure type.
 - 3. Joints: AWS A5.8 Classification BCuP-3 or BCuP-4 copper/silver braze.
 - 4. Casing: Closed glass cell insulation.
- C. Cast Iron Pipe: AWWA C151/A21.51.

1. Fittings: AWWA C110, standard thickness.
2. Joints: AWWA C111, rubber gasket.
3. Mechanical Couplings: Shaped composition sealing gasket, steel bolts, nuts, and washers.

2.3 ABOVE GROUND PIPING

- A. Steel Pipe: ASTM A 795 Schedule 10 or ASTM A 53 Schedule 40, black.
1. Steel Fittings: ASME B16.9, wrought steel, buttwelded.
 2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
 3. Malleable Iron Fittings: ASME B16.3, threaded fittings.
 4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.
 5. Mechanical Formed Fittings: Carbon steel housing with integral pipe stop and O-ring pocked and O-ring, uniformly compressed into permanent mechanical engagement onto pipe.
- B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), H58 drawn.
1. Fittings: ASME B16.18, cast copper alloy, grooved.
 2. Mechanical Grooved Couplings: Ductile iron housing with alkyd enamel paint coating clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers.
- C. Cast Iron Pipe: AWWA C151/A21.51.
1. Fittings: AWWA C110/A21.10, standard thickness.
 2. Joints: AWWA C111, rubber gasket.
 3. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped composition sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.4 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch (15 to 40 mm): Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches (50 mm) and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches (80 mm): Cast iron hook.

- E. Wall Support for Pipe Sizes 4 inches (100 mm) and Over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.
- G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.5 GATE VALVES

- A. Up to and including 2 inches (50 mm):
 - 1. Bronze body, bronze trim, rising stem, handwheel, solid wedge or disc, threaded ends.
- B. Over 2 inches (50 mm):
 - 1. Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, handwheel, OS&Y, solid bronze or cast iron wedge, flanged ends.
- C. Over 4 inches (100 mm):
 - 1. Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged ends, iron body indicator post assembly.

2.6 GLOBE OR ANGLE VALVES

- A. Up to and including 2 inches (50 mm):
 - 1. Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable rubber disc, threaded ends, with backseating capacity repackable under pressure.
- B. Over 2 inches (50 mm):
 - 1. Iron body, bronze trim, rising stem, handwheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

2.7 BALL VALVES

- A. Up to and including 2 inches (50 mm):
 - 1. Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle, threaded ends with union.
- B. Over 2 inches (50 mm):
 - 1. Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle or gear drive handwheel for sizes 10 inches (250 mm) and over, flanged.

2.8 BUTTERFLY VALVES

- A. Bronze Body:

1. Stainless steel disc, resilient replaceable seat, threaded or grooved ends, extended neck, handwheel and gear drive and integral indicating device, and built-in tamper proof switch rated 10 amp at 115 volt AC.

B. Cast or Ductile Iron Body

1. Cast or ductile iron, chrome or nickel plated ductile iron or aluminum bronze disc, resilient replaceable EPDM seat, wafer, lug, or grooved ends, extended neck, handwheel and gear drive and integral indicating device, and internal tamper switch rated 10 amp at 115 volt AC.

2.9 CHECK VALVES

A. Up to and including 2 inches (50 mm):

1. Bronze body and swing disc, rubber seat, threaded ends.

B. Over 2 inches (50 mm):

1. Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends with automatic ball check.

C. 4 inches (100 mm) and Over:

1. Iron body, bronze disc, stainless steel spring, resilient seal, threaded, wafer, or flanged ends.

2.10 DRAIN VALVES

A. Compression Stop:

1. Bronze with hose thread nipple and cap.

B. Ball Valve:

1. Brass with cap and chain, 3/4 inch (20 mm) hose thread.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.

- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Sleeve pipes passing through partitions, walls, and floors.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Pipe Hangers and Supports:
 - 1. Install hangers to provide minimum 1/2 inch (15 mm) space between finished covering and adjacent work.
 - 2. Place hangers within 12 inches (300 mm) of each horizontal elbow.
 - 3. Use hangers with 1-1/2 inch (40 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 - 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- I. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding. Refer to Section 099000.
- J. Do not penetrate building structural members unless indicated.
- K. Provide sleeves when penetrating footings, floors, and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- L. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.
- M. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.
- N. Provide drain valves at main shut-off valves, low points of piping and apparatus.

END OF SECTION