

**SECTION 21 05 00
COMMON WORK RESULTS FOR FIRE SUPPRESSION**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2020.
- C. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- D. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2021.
- E. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
- F. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators; 2023, with Errata (2024).
- G. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- I. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2023a.
- J. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.
- K. ASTM B32 - Standard Specification for Solder Metal; 2020.
- L. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- M. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2022a.
- N. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
- P. AWWA C606 - Grooved and Shouldered Joints; 2022.
- Q. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- R. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems; 2024.

1.02 SECTION INCLUDES

- A. Pipe, fittings, sleeves, escutcheons, seals, and connections for sprinkler systems.
- B. Expansion joints.
- C. Expansion loops.
- D. Signs for fire service.
- E. Fire Department Connection.
- F. Curb valves and Boxes.

1.03 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.
- B. Section 09 91 13 - Exterior Painting: Preparation and painting of exterior fire protection piping systems.

- C. Section 09 91 23 - Interior Painting: Preparation and painting of interior fire protection piping systems.
- D. Section 21 05 23 - General-Duty Valves for Water-Based Fire-Suppression Piping.
- E. Section 21 05 53 - Identification for Fire Suppression Piping and Equipment: Piping identification.
- F. Section 21 07 16 - Fire Suppression Equipment Insulation: Insulation of fire suppression equipment piping, fittings, valves, mechanical couplings, connections, hangers, insulation inserts, shields, etc.
- G. Section 21 13 00 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.

1.04 REFERENCE STANDARDS

- A. ASME A112.18.1 - Plumbing Supply Fittings; 2012.
- B. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators; 2017.
- C. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2015.
- D. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2016.
- E. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2016.
- F. ASME B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard; 2017.
- G. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999 (Reapproved 2014).
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- I. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2017.
- J. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2014).
- K. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- L. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2016.
- M. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2016.
- N. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015 (with March 2016 Errata).
- P. AWWA C606 - Grooved and Shouldered Joints; 2015.
- Q. NFPA 13 - Standard for the Installation of Sprinkler Systems; 2015, with Errata (2017).
- R. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems; 2016.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- D. Project Record Documents: Record actual locations of components and tag numbering.

- E. Operation and Maintenance Data: Include installation instructions and spare parts lists.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified this section.
 - 1. Minimum three years' experience.
- C. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

1.08 DELIVER AND STORE VALVES IN SHIPPING CONTAINERS, WITH LABELING IN PLACE.

- A. Provide temporary protective coating on cast iron and steel valves.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
 - 1. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 FIRE PROTECTION SYSTEMS

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

2.02 PIPING MATERIAL

- A. Above ground piping
STEEL PIPE: ASTM A53 SCHEDULE 40, BLACK.
 - 1. MALLEABLE IRON FITTINGS: ASME B16.3, THREADED FITTINGS AND ASTM A47/A47M.
 - 2. 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.
- B. BURIED UNDERGROUND INSIDE AND OUTSIDE THE BUILDING:
 - 1. All pipes shall be ductile iron class 52 for 4" pipe size and class 56 for 6" pipe size mechanical joint pipe. In addition, the name of the manufacturer and the pressure to which the pipe was tested shall be permanently and legibly indicated on all pipes.
 - 2. Fittings shall be ductile iron mechanical joints with pressure rating of 300 psi.
PRESSURE RATINGS SHALL BE PERMANENTLY INDICATED ON THE FITTINGS.

2.03 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

2.04 MECHANICAL COUPLINGS

A. Manufacturers:

1. Tyco Fire Protection Products; Grinnell G-Fire Figure 705 Grooved Flexible Couplings: www.tyco-fire.com.
2. Victaulic Company; FireLock Style 009H: www.victaulic.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Rigid Mechanical Coupling:

DIMENSIONS AND TESTING: COMPLY WITH AWWA C606.

2. Minimum Working Pressure: 300 psig.
3. Housing Material: Fabricate of ductile iron conforming to ASTM A536.
4. Housing Coating: Factory applied orange enamel.
5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees Fahrenheit to 230 degrees F.
6. Bolts and Nuts: Hot dipped galvanized or zinc electroplated steel.

3.01 PIPE ESCUTCHEONS

A. Pipe Escutcheons

1. Pipe escutcheons shall have inside diameter closely fitting pipe outside diameter or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Escutcheons shall be cast or sheet brass, solid or split-hinged, with brass set screw. Provide chrome finish for occupied areas exposed to view.
2. Manufacturers:
 - Zurn Industries
 - McGuire Mfg. Co.

3.02 SIGNS FOR FIRE SERVICE

- A. Sign for fire curb valve shall be brass or bronze and shall have a white background with 1" red letters reading "Automatic Sprinkler Shutoff Valve 2 feet opposite this sign".
- B. Sign for main sprinkler control valve inside the building shall be an enameled sign, 4" x 10". The sign shall have a white background with 1" red letters reading "Main Sprinkler Valve"

3.03 FIRE DEPARTMENT CONNECTION

- A. Exposed type shall be of the size indicated on the drawings. Fire Department connections shall be polished brass with two individual drop clapper valves, pin lug swivels, plugs and chains painted green and with polished brass wall plate lettered "SPRINKLER" inscribed in letter sizes inch-high and 1/8 inch deep. The letter inscription shall be either an integral part of the plate or on a separate nameplate securely fastened to or above the Fire Department connection. Expose type shall be Potter- Roemer, Fig. 5750 Series (THREADS: N.Y.F.D.) or Croker Corp. Fig 6430 Series (3" NYCFD inlets). Threads shall be to NYC Fire Department specifications.
- B. Approved Manufacturers:
 - Elkhart Brass Mfg. Co., Inc.
 - Croker
 - Potter Roemer

3.04 CURB VALVES AND BOXES

- A. Curb valves and boxes with covers for all water service pipes shall be as approved by the Department of Environmental Protection.
- B. Curb valves shall be of the gate type, non-rising stem valves, designed for a minimum of 150 lbs. per square inch working pressure.
- C. Valves shall be equipped with an operating nut at least 1 1/4" square. A wrench or key for operating each valve shall be left with the Custodian or with a representative of the Authority.
- D.

PART 3 EXECUTION

4.01 INSTALLERS

4.02 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.

4.03 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. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Inserts:
 - 1. Provide inserts for placement in concrete formwork.
 - 2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- G. Pipe Hangers and Supports:
 - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 2. Place hangers within 12 inches of each horizontal elbow.
 - 3. Use hangers with 1-1/2 inch 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.
- J. Structural Considerations:
 - 1. Do not penetrate building structural members unless indicated.

- K. Provide sleeves when penetrating footings, floors, walls, partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

4.04 ESCUTCHEONS:

1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
 2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
 3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
- B. 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.

4.05 CLEANING

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION 21 05 00

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