

## SECTION 13 1403 – WATER FEATURE PIPE HANGERS, SUPPORTS, AND ANCHORS

**PART 1 - GENERAL****1.1 SUMMARY**

- A. This section includes the following:
  - 1. Pipe and Equipment Hangers and Supports
  - 2. Equipment Pads and Supports
  - 3. Sleeves, Seals, and Waterstop Flanges
  - 4. Thrust Blocks
  - 5. Flexible Couplings
- B. Related Sections:
  - 1. SECTION 13 1204 – WATER FEATURE CAST IN PLACE CONCRETE
  - 2. SECTION 13 1401 – WATER FEATURE PIPE AND FITTINGS
  - 3. SECTION 13 1502 – WATER FEATURE PUMPS AND MOTORS
  - 4. SECTION 13 1503 – WATER FEATURE FILTERS
  - 5. SECTION 13 1504 – WATER FEATURE CHEMICAL FEED SYSTEMS
  - 6. SECTION 13 1505 – WATER FEATURE OZONE GENERATION AND INJECTION
  - 7. SECTION 13 1506 – WATER FEATURE UV STERILIZERS
  - 8. SECTION 13 1507 – WATER FEATURE HEATERS
  - 9. SECTION 13 1508 – WATER FEATURE HYDRONIC SYSTEMS
  - 10. SECTION 13 1509 – WATER FEATURE CHILLERS
  - 11. SECTION 13 1510 – WATER FEATURE HEAT EXCHANGERS
  - 12. SECTION 13 1511 – WATER FEATURE VALVES, GAUGES, AND METERS
- C. References:
  - 1. ASME B31.2 – FUEL GAS PIPING
  - 2. ASME B31.9 – BUILDING SERVICES PIPING
  - 3. ASTM A536 – STANDARD SPECIFICATION FOR DUCTILE IRON CASTING
  - 4. ASTM F708 – STANDARD PRACTICE FOR DESIGN AND INSTALLATION OF RIGID PIPE HANGERS
  - 5. MMS SP58 – PIPE HANGERS AND SUPPORTS – MATERIALS, DESIGN AND MANUFACTURER
  - 6. MMS SP69 – PIPE HANGERS AND SUPPORTS – SELECTION AND APPLICATION

**1.2 SUBMITTALS FOR REVIEW**

- A. SECTION 01 3300 – SUBMITTAL PROCEDURES
- B. Product Data: Provide manufacturers catalog data including type of material and load capacity.
- C. Shop Drawings: The Contractor shall provide drawings indicating hanger schedule and layout showing location, type, and material of hanger, sign and sealed by a Structural Engineer.
- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipes, and riser support hangers.
- E. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.
- F. Warranty: Submit manufacturer's warranty and ensure forms have been completed in the owner's name and registered with the manufacturer.

**PART 2 - PRODUCTS****2.1 PIPE HANGERS AND SUPPORTS**

- A. Acceptable Manufacturers
  - 1. Grinnell
  - 2. Eaton B-Line

## B. Pipe Hangers:

1. Conform to ASME B31.9 and ASTM F708.
2. All Hangers shall be fiberglass or stainless steel. Galvanized is acceptable only for installations in non-marine or non-coastal environments subject to approval by the Engineer.
3. Hangers for pipe sizes 1/2-inch to 1-1/2-inch (15mm to 40mm): adjustable swivel, split ring style
4. Hangers for pipe sizes 2-inch (50mm) and larger: adjustable, clevis style.
5. Multiple or Trapeze Hangers: fiberglass channels with spacers and hanger rods. Galvanized material is acceptable for non-marine or non-coastal environments subject to approval by the Engineer.
6. Hangers shall be sized to support the pipe when full of water.

## C. Hanger Rods:

1. Use rod threaded at both ends or continuously threaded. Stainless steel rod for marine environments. For non-marine or non-coastal environments galvanized steel is acceptable, subject to approval by the Engineer.
2. Sized adequately to support pipes full of water.

## D. Fasteners:

1. Shall be fiberglass or stainless steel. Galvanized is acceptable only for non-marine or non-coastal environments, subject to approval by the Engineer.

## 2.2 WALL SLEEVES and SEALS

## A. Acceptable Manufacturers

1. Linkseal
2. GPT industries
3. Innerlynx

## B. Sleeves: Molded, non-metallic high density polyethylene

## C. Fasteners: 316L Stainless Steel

## D. Pressure Plates: Molded glass reinforced nylon

## E. Elastomers: EPDM

## 2.3 WATERSTOP FLANGES

## A. Acceptable Manufacturers

1. ASA Manufacturing Incorporated
2. Lawson Aquatics
3. Approved Custom Fabrication

## B. PVC Waterstop Sleeve Fittings

1. Shall be constructed of PVC and be capable of being primed and glued in place.
2. Waterstop shall be place between the water-retaining side of the wall and the reinforcing steel
3. Waterstop shall be tied in place to the reinforcing steel.

## C. Fiberglass Waterstop Sleeve Fittings

1. Shall be constructed of fiberglass and be capable of accepting Schedule 40 and Schedule 80 PVC pipe with socket-to-socket connections.

## 2.4 FLEXIBLE COUPLINGS

## A. Acceptable Manufacturers

1. Cascade Waterworks

2. Baker Couplings
3. Trupply – Dresser Couplings
- B. Ductile Iron end and center rings complying with ASTM A536.
- C. EPDM or Viton® gaskets.
- D. Fasteners shall be 316L Stainless Steel, including nuts, bolts, and washers.
- E. Coupling shall be designed for below ground installation.

**PART 3 - EXECUTION****3.1 Installation**

- A. General:
  1. Acceptable pipe supports are shown in the General Details section of the Contract Documents.
  2. Support Valves and Equipment adequately at both flanges, if in a horizontal position, and by the top flange if in a vertical position.
- B. Pipe Hangers and Supports
  1. Support horizontal and vertical piping as scheduled.
  2. Install hangers to provide a minimum 1/2-inch (13mm) space between finished covering and adjacent work.
  3. Place hangers within 12-inches (0.3m) of each horizontal elbow.
  4. Use hangers with 1-1/2-inch (38mm) minimum vertical adjustment
  5. Support horizontal pipe with a 5-feet (1.5m) maximum spacing between hangers, or as determined by Structural Engineer.
  6. Provide lateral restraints at bends in pipe as required and as directed by the Structural Engineer
  7. Support vertical piping at every floor the pipe passes through. Provide intermediate supports where spacing exceeds 10-feet (3m) between supports.
  8. Support for vertical piping shall include both vertical and lateral support.
  9. Install couplings or similar tight fitting metal sleeve at each floor support for vertical piping. Couplings or sleeves shall rest on and transmit load to support.
  10. Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.
  11. Provide copper plated hangers and supports for copper piping.
  12. Design hangers for pipe movement without disengagement of supported pipe.
  13. Size Hanger Rods, screws, bolts, nuts, etc according to manufacturer's sizing charts for mass and pipe size being supported.
  14. Do not use wire or other makeshift devices for hangers.
  15. Pipe located near the floor may be supported with galvanized steel stanchions welded to end plates and secured to pipe and floor.
  16. To prevent sway and lateral movement due to thrust, provide angle iron bracing anchored into walls or overhead framing at bends. In seismic zones, use appropriate sway suppression devices.
- C. Equipment Pads and Supports
  1. Provide Equipment, or Housekeeping, Pads of concrete, minimum of 4-inches (0.1m) thick and extending a minimum of 3-inches (75mm) beyond supported equipment, unless otherwise noted on the Contract Documents.
  2. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
  3. Provide shims, anchors, support straps, angles, grouted bases, or other items required to accomplish proper installation.
  4. Construction of galvanized steel stanchions welded to end plates secured to the floor and pipe or equipment.

## D. Sleeves, Seals, and Water Stop Flanges

1. Set Sleeves in position in form work. Provide adequate reinforcing around sleeves.
2. Size Sleeves large enough to allow for movement due to expansion and contraction.
3. Extend Sleeves through floors 1-inch (25mm) above finished floor level. Chalk Sleeves.
4. Install "Link Seal" type waterproof seal at all penetrations to floors, ceilings, or walls that do not penetrate water retaining structures.
5. Install water stop flanges with a bead of Swell Seal around pipe at the base of the flange for all penetrations into water retaining structures.
6. Waterstop shall be placed between the water-retaining side of the wall and the reinforcing steel.
7. Provide a minimum 2-inch (50mm) cover of concrete for all Waterstop Flange couplings.
8. Waterstop shall be tied in place to the reinforcing steel.

## E. Thrust Blocks

1. Install concrete anchor blocks, thrust blocks, and support blocks with tie downs to support pipe, fittings, or valves as indicated on the drawings.
2. For buried piping install concrete thrust blocks at the first bend after mechanical fasteners, or after a pipe penetrates a wall.
3. Thrust blocks may not be required for glued or welded pipe, subject to approval by the Engineer.

## F. Flexible Couplings

1. Install Flexible Couplings in areas of anticipated differential settlement including, but not limited to:
  - a. Building wall penetrations.
  - b. Retaining and site wall penetrations.
2. Install two (2) couplings per pipeline with a minimum of 2-feet (0.6m) spacing between couplings
3. Support couplings to prevent pipe pullout.
4. Provide concrete thrust block at first bend after flexible couplings.
5. When couplings are used to repair broken pipes, install concrete thrust blocks upstream and downstream from the coupling.

END OF SECTION