

SECTION 15055 - COMMON PIPING REQUIREMENTS

- PART 1 - GENERAL
SECTION REQUIREMENTS
1. Comply with the requirements of the Building Code and the local authority having jurisdiction.
PART 2 - PRODUCTS
2.1 SUPPORTING DEVICES
A. Hangers and Pipe Attachments: Factory fabricated with galvanized coatings; nonmetallic coated for hangers in direct contact with copper tubing.
B. Building Attachments: Powder actuated pipe, drive pin attachments with pullout and shear capacities appropriate for supported loads and building materials; UL listing and FM approval for fire protection systems.
C. Mechanical Anchor Fasteners: Insert-type attachments with pullout and shear capacities appropriate for supported loads and building materials; UL listing and FM approval for fire protection systems.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install pipes free of sag and bends.
B. Install fittings for changes in direction and branch connections.
C. Install sleeves for pipes passing through concrete and masonry walls, gypsum board partitions, and concrete floor and roof slabs.
D. Exterior Wall, Pipe Penetrations: Mechanical sleeve seals installed in steel or cast iron pipes for wall sleeves.
E. Fire Barrier Penetrations: Seal pipe penetrations with through penetration firestop systems.
F. Install unions adjacent to each valve and at final connection to each piece of equipment.
G. Install dielectric unions and flanges to connect piping materials of dissimilar metals in gas piping.
H. Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals in water piping.
I. Provide full fire enclosures at plumbing penetrations through walls or ceilings; tightly seal enclosures to the adjacent surface.
3.2 HANGERS AND SUPPORTS
A. Install building attachments within concrete or to structural steel. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping.
B. Install powder actuated drive pin fasteners in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.
C. Install mechanical anchor fasteners in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.
D. Support fire protection system piping independent of other piping.
E. Load Distribution: Install hangers and supports so piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
END OF SECTION 15055

SECTION 15072 - VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

- PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Vibration Isolators.
2. Ductwork Lagging.
1.2 PERFORMANCE REQUIREMENTS
A. Provide vibration isolation on motor driven equipment over 0.5 hp, plus connected piping and ductwork.
1.3 SUBMITTALS
A. Product Data: Submit schedule of vibration isolator type with location and load on each. Submit catalog information indicating materials, dimensional data, pressure losses, and acoustical performance for standard sound attenuation products.
B. Manufacturer's Installation Instructions: Submit special procedures and setting dimensions. Indicate installation requirements maintaining integrity of sound isolation.
PART 2 - PRODUCTS
2.1 VIBRATION ISOLATORS
A. Open Spring Isolators:
1. Spring Isolators:
a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
b. Code: Color code springs for load carrying capacity.
2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
3. Spring Mounts: Furnish with leveling devices, minimum 0.25 inch thick neoprene sound pads, and zinc chromate plated hardware.
B. Seismic Snubbers:
1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
2. Neoprene Elements: Resilient, minimum of 0.75 inch thick.
3. Capacity: 4 times load assigned to mount; groupings at 0.4 inch deflection.
4. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install isolation for motor driven equipment.
B. Adjust equipment level.
C. Install spring hangers without binding.
D. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
E. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
F. Provide resiliently mounted equipment, piping, and ductwork with seismic snubbers. Provide each inertia base with minimum of four seismic snubbers located close to isolators. Snub equipment designated for post disaster use to 0.05 inch maximum clearance. Provide other snubbers with clearance between 0.15 inch and 0.25 inch.
G. Support piping connections to isolated equipment resiliently as follows:
1. Up to 4 inch Diameter: First three points of support.
2. Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.
END OF SECTION

SECTION 15080 - MECHANICAL INSULATION

- PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. Submittals: None.
B. Quality Assurance: Labeled with maximum flame spread rating of 25 and maximum smoke developed rating of 50 according to ASTM E 84.
PART 2 - PRODUCTS
2.1 PIPE INSULATION
A. Preformed Glass Fiber Pipe Insulation: ASTM C 547, Class 1, with factory applied, all purpose, vapor retarder jacket.
B. Polyethylene Pipe Insulation: Unidirectional polyethylene, preformed pipe insulation. Comply with ASTM C 534, Type I, except for density.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install vapor barriers on insulated pipes with surface operating temperatures below 60 deg F.
B. Insulate fittings, valves, and specialties.
C. Seal vapor barrier penetrations for hangers, supports, anchors, and other projections.
D. Coat glass fiber pipe insulation ends with vapor barrier coating.
E. Roof Penetrations: Apply insulation for interior applications to a point even with the top of the roof flashing.
F. Exterior Wall Penetrations: For penetrations of below grade exterior walls, terminate insulation flush with mechanical sleeve seal.
G. Interior Walls and Partitions Penetrations: Apply insulation continuously through walls and partitions, except fire rated walls and partitions.
H. Fire Rated Walls and Partitions Penetrations: Terminate insulation at penetrations through fire-rated walls and partitions. Seal around penetration with through penetration firestop systems.
I. Floor Penetrations: Terminate insulation at the underside of the floor assembly and at the floor support at top of floor. Seal around penetration with through penetration firestop systems.
J. Glass Fiber Insulation Installation: Bond insulation to pipe with adhesive. Seal seams and joints with vapor barrier compound.
K. Interior Piping System Applications: Insulate the following piping systems:
1. Domestic cold, hot, and recirculation water pipes.
2. Exposed sanitary drains and water supply pipes for public hand sinks.
3. Refrigerant piping.
L. Do not apply insulation to the following systems, materials, and equipment:
1. Flexible connections.
2. Fire protection piping systems.
3. Sanitary drainage and vent piping.
4. Chrome plated pipes and fittings, except for plumbing fixtures for the disabled.
5. Piping specialties, including air chambers, unions, strainers, check valves, plug valves, and flow regulators.
M. Pipe Insulation Thickness Application Schedule: Insulate piping with the following materials and thicknesses:
1. Domestic Hot and Recirculation water pipes: 1 inch preformed glass fiber pipe insulation.
2. Domestic Cold Water: 1/2 inch preformed glass fiber pipe insulation.
3. P-Trap and Fixture Supplies for public hand sinks: ASH compliant pre-formed insulation.
END OF SECTION 15080

SECTION 15110 - VALVES

- PART 1 - GENERAL (Not Applicable)
PART 2 - PRODUCTS
2.1 GENERAL DUTY VALVES
A. End Connections: Threads shall comply with ANSI B1.20.1. Flanges shall comply with ANSI B16.1 for cast iron valves and ANSI B16.24 for bronze valves. Solder-joint connections shall comply with ANSI B16.38.
B. Ball Valves: Rated for 150 psig saturated steam pressure, 400 psig WOG pressure; 2 piece construction; with bronze body, standard (or regular) port, chrome plated brass ball, replaceable "Teflon" or "TFE" seats and seals, blowout proof stem, and vinyl covered steel handle.
C. Plug Valves: Rated at 150 psig WOG; bronze body with straightaway pattern, square head, and threaded ends.
D. Swing Check Valves: Cast 125, cast bronze body and cap; with horizontal swing, Y pattern, and bronze disc.
E. Valves for Copper Tube: Solder ends, except provide threaded ends for treating hot water and low pressure steam service.
F. Valves for Steel Pipe: Threaded ends.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Use gate and ball valves for shut-off duty and ball for throttling duty.
B. Locate valves for easy access and provide separate support where necessary.
C. Install accessible valves for each fixture and item of equipment.
D. Install valves in horizontal piping with stem at or above center of pipe.
E. Install valves in a position to allow full stem movement.
F. Install check valves for proper direction of flow in horizontal position with hinge pin level.
END OF SECTION 15110

SECTION 15140 - DOMESTIC WATER PIPING

- PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. Performance Requirements: Unless otherwise indicated minimum pressure requirements for water piping are as follows:
1. Service Entrance Piping: 100 psig.
2. Domestic Water Piping: 80 psig.
B. Comply with NSF 14 "Plastic Piping Components and Materials."
C. Comply with NSF 61 "Drinking Water System Components - Health Effects."
PART 2 - PRODUCTS
2.1 PIPES AND TUBES (See Material Schedule on sheet P010 for where these materials are to be used)
A. Hard Copper Tube: ASTM B 88, Types L and M, water tube, drawn temper.
B. PVC Plastic, Water Pipe: ASTM D 1785, Schedule 80, plain ends.
2.2 FITTINGS
A. Wrought Copper, Solder Joint Pressure Fittings: ASME B 16.22.
B. Cast Copper Alloy, Solder Joint Pressure Fittings: ASME B 16.18.
C. Bronze Flanges: ASME B 16.24, Classes 150 and 300.
D. Copper Unions: ASME B 16.38, cast copper alloy body, hexagonal stock, with ball and socket joint, metal to metal seating surfaces, and solder joint, threaded, or solder joint and threaded ends. Threads complying with ASME B 1.20.1.
E. PVC Plastic, Schedule 80, Socket Type Pipe Fittings: ASTM D 2467.
2.3 DRINKING MATERIALS
A. Solder Filler Metals: ASTM B 32, lead free.
B. Braising Filler Metals: AWS AS.8, alloys to suit system requirements.
C. Solvent Cements: As recommended by manufacturer.
D. Plastic Pipe Seals: ASTM F 477, elastomeric gasket.
PART 3 - EXECUTION
3.1 VALVE APPLICATIONS
A. Install gate valves close to main on each branch and riser serving two or more plumbing fixtures or equipment connections and where indicated.
B. Install gate or ball valve on inlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated.
C. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.
D. Install swing check valve on discharge side of each pump and elsewhere as indicated.
E. Install ball valves in each hot water circulating loop and discharge side of each pump.
3.2 PIPING INSTALLATIONS
A. Install hangers and supports at intervals indicated in the applicable plumbing code and as recommended by pipe manufacturer.
B. Support vertical piping at each floor.
3.3 INSPECT AND CLEAN UP
A. Inspect and test piping systems following procedures of authorities having jurisdiction.
B. Clean and disinfect water distribution piping following procedures of authorities having jurisdiction.
END OF SECTION 15140

SECTION 15150 - SANITARY WASTE AND VENT PIPING

- PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. Minimum Pressure Requirement for Soil, Waste and Vent: 10 feet head.
B. Comply with NSF 14 "Plastic Piping Components and Related Materials".
PART 2 - PRODUCTS
2.1 PIPES AND TUBES
A. PVC Plastic, DWV Pipe: Cast Iron Hubless DWV Pipe: ASTM D 2665, Schedule 40, plain ends.
2.2 FITTINGS
A. PVC Plastic, DWV Pipe Fittings: Cast Iron Hubless DWV Fittings: ASTM D 2665, made to ASTM D 3311; socket type; drain, waste, and vent pipe patterns.
PART 3 - EXECUTION
3.1 PIPING INSTALLATION
A. Install cleanout and extension to grade at connection of building sanitary drain and building sanitary sewer.
B. Locate drainage piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.
3.2 INSPECTION
A. Inspect and test piping systems following procedures of authorities having jurisdiction.
END OF SECTION 15150

SECTION 15410 - PLUMBING FIXTURES

- PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
Submittals: None.
A. Comply with requirements of Public Law 102-486, "Energy Policy Act", regarding water flow rate and water consumption of plumbing fixtures.
B. Comply with applicable standards below:
1. Enamelled, Cast Iron Fixtures: ASME A112.19.1M.
2. National Sanitation Foundation Construction: NSF32.
3. Porcelain Enamelled Fixtures: ASME A112.19.4M.
4. Slip Resistant Bathtub Surfaces: ASTM F 462.
5. Stainless Steel Fixtures: ASME A112.19.3M.
6. Vitreous China Fixtures: ASME A112.19.2M.
PART 2 - PRODUCTS
2.1 Refer to the fixture schedule on drawing P600
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install fixtures with flanges and gasket seals.
B. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment; install other actuators in locations that are easy for the disabled to reach.
C. Fasten wall hanging plumbing fixtures securely to supports attached to building structure when supports are specified, and on building wall construction where no support is indicated.
D. Fasten floor mounted fixtures to substrate. With fixtures having through wall construction, fasten reinforcement built into walls.
E. Fasten wall mounted fittings to reinforcement built into wall.
F. Fasten counter mounted plumbing fixtures to countertop.
G. Secure supplies to supports or substrate with appropriate fasteners.
H. Set mop basins in leveling bed of cement.
I. Install individual supply inlets, supply risers, and traps for floor traps with cleanouts at fixture.
J. Install water supply stop valves in accessible locations.
K. Install traps on fixture or floor traps. Floor traps shall have cleanouts. Omit traps on indirect wastes, unless otherwise indicated or required by the applicable laws and jurisdiction.
L. Install individual supply inlets, supply risers, and traps for floor traps with cleanouts at fixture.
M. Install cleanouts where required on concealed piping and fittings.
N. Install pipe connections between plumbing fixtures and piping systems and plumbing equipment. Install insulation on supplies and drains of fixtures for the disabled.
O. Install equipment, plumbing connections and terminals according to UL 486A and UL 486B.
END OF SECTION 15410

PLUMBING GENERAL NOTES

- A. GENERAL NOTES APPLY TO PLUMBING SHEETS.
B. PLUMBING WORK SHALL BE DONE IN ACCORDANCE WITH THE PLUMBING CODE, LOCAL HEALTH DEPARTMENT STANDARDS, AND THE AUTHORITY HAVING JURISDICTION. SEE SHEET A000 FOR THE PREVAILING CODES.
C. PIPING LAYOUTS ON DRAWINGS ARE SCHEMATIC. EXACT LOCATIONS ARE TO BE COORDINATED WITH THE EXISTING CONDITIONS AND THE WORK OF OTHER TRADES.
D. CONCEAL PIPING UNLESS NOTED OTHERWISE. WATER SUPPLY PIPES SHALL BE INSTALLED LEVEL.
E. PROVIDE SHUT-OFF VALVES FOR ISOLATION OF FIXTURE GROUPS AS SHOWN ON DRAWINGS IN ADDITION TO STOP VALVES AT EACH FIXTURE.
F. PROVIDE STOP VALVES AT FIXTURES.
G. PROVIDE TRAP PRIMERS FOR FLOOR DRAINS.
H. WHERE THE WATER LINE SIZE SHOWN IN THE PLUMBING DIAGRAMS DIFFERS FROM THE FIXTURE OR EQUIPMENT CONNECTION SIZE, PROVIDE LINE SIZE PIPE TO WITHIN 6" OF THE FIXTURE OR EQUIPMENT BEFORE TRANSITIONING TO THE CONNECTION SIZE.
I. PIPING IN EXTERIOR WALLS SHALL BE INSTALLED BETWEEN THE INSULATION AND THE INTERIOR WALL FINISHING MATERIAL.
J. INSULATE THE HOT AND COLD WATER, CONDENSATE DRAINAGE, AND STORM PIPING PER THE SPECIFICATIONS AND DETAIL 4/PS-0.
K. PLUMBING FIXTURES, ACCESSORIES, AND MATERIALS PROVIDED FOR DOMESTIC WATER SHALL BE LEAD FREE.
L. ALL MATERIALS USED ABOVE THE CEILING SHALL BE PLENUM RATED.

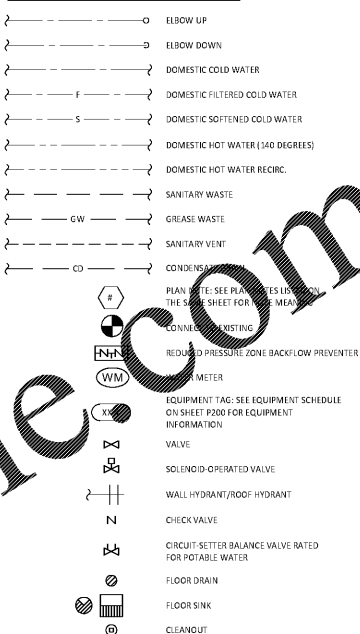
PLUMBING ABBREVIATIONS

Table with 2 columns: Abbreviation and Description. Includes AFF (Above Finished Floor), AFG (Above Finished Grade), CO (Floor Cleanout), FD (Floor Drain), FS (Floor Sink), GCO (Grade Cleanout), WCO (Wall Cleanout).

PLUMBING MATERIAL SCHEDULE

Table with 3 columns: Category, Application, Allowable Material. Includes Water Supply Pipe (Above Grade, Type L Copper Tube), Sanitary Waste & Vent Pipe (Above Ground, Concealed, Cast Iron Hubless DWV Pipe and Fittings), and Sanitary Waste & Vent Pipe (Below Ground, PVC Plastic DWV Pipe and Fittings).

PLUMBING SYMBOLS



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