

PART 1 - GENERAL

- 1.1 All piping shall be supported from the building structure.
- 1.2 All products and assemblies installed with-in a plenum shall not exceed a maximum flame spread of 25 and a smoke development of 50 as established by UL 723 or ASTM E84 test methods. However, "discrete" combustible components as defined by the mechanical code may be UL 2043 listed in lieu of UL 723 or ASTM E84.

PART 2 - PRODUCTS

- 2.1 Manufacturers listed below are basis of design. Other approved equal manufacturers are B-line, Erico, Mason, PHD and TOLCO.
- 2.2 Hangers and supports for horizontal piping shall be equal to:
 - A. General service - clevis type Anvil Fig. 260.
 - B. Uninsulated copper tubing - copper plated clevis type - Anvil Fig. CT-65 (or plastic coated clevis).
- 2.3 Hanger rods shall be solid steel, threaded end or all thread rod, of diameter listed below. A hanger attachment device (beam clamps, concrete inserts, etc.) and locking nuts at the hanger attachment shall be provided on each hanger. Locking nuts shall be provided at each clevis and trapeze type hanger.

<u>Pipe Sizes</u>	<u>Min. Rod Dia.</u>
2" and smaller	0.375"
2.5" to 3"	0.50"

- 2.4 Where the length of the hanger rod between the top of the hanger and the attachment device is 3 inches or less, clevis type hangers with rollers, Anvil Fig. 181, shall be used to allow for expansion travel.
- 2.5 Hanger rod attachment devices for attachment to the structure shall be:
 - A. After-set steel expansion type concrete inserts.
 - B. Beam clamps for steel construction equal to Anvil Fig. 92, 93, 94 or 14.
 - C. Channel support systems equal to Unistrut or Hilti.
 - D. Multi-purpose rod hanger for structural purlins equal to Erico Caddy Model #PH, Fig. #2 for pipe sizes up to 3 inches.
- 2.6 Trapeze hangers for numerous pipes run in parallel may be utilized. Horizontal support members shall be unistrut type section with pipe rollers (to allow for expansion travel) and spring and nut connectors, suspended with hanger rods and attachments similar to individual pipe hanger suspension. Piping 1" and smaller and specified to be insulated with elastomeric type insulation may utilize Anvil's 25/50 flame/smoke rated Klo-Shure strut-mounted TPO plastic insulation couplings with steel strut clamp. Insulation wall thickness shall be 0.75" thickness. Transition to required service insulation thickness within 2" of either side of coupling.

- 2.7 Hangers on insulated horizontal piping shall be oversized to surround the pipe insulation. To protect the insulation from damage or inordinate compression due to concentrated weight, provide sheet metal shields and insulation inserts as specified in 22 07 19 Plumbing Piping Insulation.
- 2.8 Insulation shields shall be compatible with pipe insulation materials and thicknesses. Vapor barrier shall be continuous.
- 2.9 Coordinate the items above during the bidding period and determine, consistent with industry practice, the selection, furnishing and installation of the needed components.

PART 3 - EXECUTION

- 3.1 Spacing of hangers and supports shall be as follows; unless otherwise shown on drawings:
 - A. Steel pipe (vertical) - at the base, at each floor level, and 15 ft. maximum spacing.
 - B. Steel pipe (horizontal) - 7 ft. intervals for piping 1.5 inches size and smaller, 10 ft. spacing for piping 2 inches thru 6 inches, 12 ft. spacing for larger pipe.
 - C. Copper tubing (vertical) - at the base, at each floor level; and 10 ft. maximum spacing.
 - D. Copper tubing (horizontal) - 6 ft. spacing for tubing 1.25 inches size and smaller, 8 ft. spacing for 1.50 inches thru 2.5 inches sizes, 10 ft. spacing for tubing 3 inches size and larger.
 - E. Cast iron pipe (vertical) - at the base and at each floor (15 ft. maximum spacing).
 - F. Cast iron pipe (horizontal) - at each fitting and at each joint on straight lengths, 10 ft. maximum spacing.
 - G. Plastic Pipe - spacing and hanging methods in strict accordance with code requirements and manufacturer's recommendations, with consideration being given to service temperature and expansion compensation, but no greater than 4 feet spacing for horizontal and no greater than 10 feet spacing for vertical piping (with midstory guide).
- 3.2 Attachment of pipe hangers to the structure shall be with:
 - A. After-set concrete inserts, in 4 inches minimum depth concrete, set in drilled holes. Powder actuated driven fasteners are not permitted.
 - B. Beam clamps in steel construction. Provide anchoring where clamps are attached to sloping surfaces of beam flanges and where otherwise required to ensure permanent attachment. Attachment to bar type joists shall be at joist panel points only.
 - C. Unistrut type channel support system may be utilized where a number of pipes are run parallel or to span below other utilities and equipment. Channel shall be pre-set or attached to the structure with inserts or clamps.
 - D. Attachment to steel deck is prohibited. Span from steel structural members with supplementary steel shapes where direct attachment to structural members is not practical. This does not apply to steel deck with concrete slab poured on the deck. Refer to A. and B. above.
 - E. Attachment to manufactured trusses and other engineered structural members and supports shall be done in strict accordance with the structural manufacturers recommendations. Refer to the architectural and structural drawings for type of engineered structural systems being used. Connections to these structural members shall be made with connection devices and methods approved by the structural manufacturer. Provide additional supports with

supplemental steel shapes when spacing between structural members exceeds specified distances.

- 3.3 Pipe hangers shall be adjusted to proper elevation, hanger rods set in a vertical position and locking nuts secured before pipe insulation is installed.
- 3.4 Hanger and support assemblies which are not factory plated (galvanized or copper) and will remain exposed on completion of the project shall be painted before installation.
- 3.5 Do not bend hanger rod to set in vertical position. Use manufactured hanger rod attachments that swivel to allow the hanger rods to hang vertically, or provide supplemental steel attached to the building structure and standard hanger rod attachments to allow the hanger rods to hang vertically. Refer to the following Manufacturers Standardization Society (MSS) Standard practices on pipe hangers and supports:
 - A. MSS SP-58 on Materials, Design and Manufacturer
 - B. MSS SP-69 on Selection and Application
 - C. MSS SP-89 on Fabrication and Installation Practices

END OF SECTION