

GENERAL:

The scope of this document is to provide instruction for the installation of pipe supports for exterior underground steam and condensate distribution piping.

DESIGN GUIDELINES:**A. Materials**

1. Support Tees and Slides
 - 1.1. Hot piping shall have pipe tee and slides at all support points. Tees and Slides shall be Figures 257 as manufactured by Anvil International, North Kingstown RI or approved equal. Unless otherwise noted, slide depth shall be equal to or slightly greater than insulation thickness.
2. Pipe Guides
 - 2.1. Steam and condensate piping runs shall include hot dip galvanized pipe guides where indicated on drawings. Guides shall be Figure 256 as manufactured by Anvil International, North Kingstown RI or approved equal.
3. Copper Pipe
 - 3.1. Sump pump discharge piping shall be supported from manhole wall using copper finished extension split tubing clamp Figure CT-138R as manufactured by Anvil International, North Kingstown RI or approved equal, with 3/8" stainless steel expansion anchor.
4. U-Bolts
 - 4.1. U-bolts shall be galvanized carbon steel furnished with four finished hex nuts. U-bolts shall be Figure 137 as manufactured by Anvil International, North Kingstown RI or approved equal.
5. Hanger Rods
 - 5.1. Hanger rods shall be machine threaded rods ASTM A36 or ASTM A575 with threads conforming to ANSI B1.1., Figure 140,253 as manufactured by Anvil International, Hot Dipped Galvanized North Kingstown RI or approved equal. Minimum rod size shall be as follows:

<u>Pipe Size Hanger</u>	<u>Rod Diameter</u>
2" and under	3/8"
2-1/2", 3"	1/2"
4"	5/8"
6", 8"	3/4"
10", 12"	7/8"
14" thru 18"	1"

6. Unless otherwise shown or specified upper attachments for concrete ceilings shall be as follows:
 - 6.1. Concrete single lug plate shall be Hot Dipped Galvanized Figure 47, or clevis plate Figure 49 all as manufactured by Anvil International, North Kingstown RI or approved equal. Expansion anchors shall be stainless steel.

- 6.2. For pipe 4" and under (optional): Hot Dip Galvanized, drop-in type female expansion anchor.
- 7. Hangers
 - 7.1. Hangers required for horizontal piping in manholes shall be as follows and all as manufactured by Anvil International, North Kingstown RI or approved equal:
 - 7.1.1. Uninsulated pipe: Adjustable clevis, Figure 260, Hot Dipped Galvanized.
 - 7.1.2. Insulated Pipe: Adjustable clevis, Figure 260, Hot Dipped Galvanized.
 - 7.1.3. Copper Pipe: Adjustable tubing ring, plastic coated, Figure CT-99C or equal).
- 8. Structural Steel
 - 8.1. Miscellaneous structural steel, plates, etc. for pipe supports and anchors in trenches and manholes shall be ASTM A36 of sizes and shapes needed, no tubular members.
 - 8.2. All structural steel members and end plates shall be hot dipped galvanized ASTM, A123. Any galvanizing damaged by welding or erection shall be repaired with cold galvanizing per ASTM A780. Surface preparation shall include power disk sanding the abraded or welded area to bright metal.
 - 8.3. Miscellaneous plates and pipe used for supports/anchors shall be cleaned and painted with zinc rich paint.
 - 8.4. Welding of structural steel supports and anchors shall be completed with E70XX electrodes.
- 9. Expansion Bolts
 - 9.1. Expansion bolts and nuts used in connection with pipe support structures shall be Hot Dipped Galvanized "Kwik Bolt III" as manufactured by Hilti Inc., Tulsa OK, or approved equal installed per manufacturer's recommendations. Minimum embedment shall be as follows:

<u>Bolt Diameter, in.</u>	<u>Embedment, in.</u>
1/2	3-1/2
5/8	4
3/4	4-3/4
1	4-1/2

B. Installation

- 1. General
 - 1.1. All piping shall be supported to prevent excessive stress, swaying, sagging, or vibration. Piping shall not be so restrained, however, as to cause it to snake or buckle between supports or anchors or to prevent movement due to expansion and contraction.
 - 1.2. Supports shall be complete, including lock nuts, clamps, rods, bolts, couplings, swivels, inserts, required accessory items and secondary structural steel

2. Spacing

2.1. The maximum support spacing for horizontal piping shall be as follows:

<u>Steel Pipe (MPS, MPC, PC)</u>	<u>Steam & Liquids</u>
2" and under	6'
6", 8"	12'
10", 12", 14", 16", 24"	24'
 <u>Copper Tube</u>	
1/2", 3/4"	5'
1"	6'
1-1/4"	7'
1-1/2", 2"	8'
2-1/2"	9'
3" and above	10'

Supports in chase shall be installed off the floor of chase a minimum of 1".

C. Commissioning

1. All piping must have needed supports installed and properly adjusted prior to turning the system on.

REFERENCES