

SECTION 15094PIPE HANGERS & SUPPORTSPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included: Furnish and install pipe hangers and supports to rigidly support pipes, maintain the necessary pitch, prevent vibration, prevent movement, and to allow expansion and contraction of the type(s) and in the location(s) shown on the Drawings and specified herein.
- B. Related Work Specified Elsewhere: "Pipe & Pipe Fittings - General" is specified in this Division.

1.2 REFERENCES

- A. Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS)
 - 1. MSS SP-58 Pipe Hangers and Supports – Materials, Design and Manufacture
 - 2. MSS SP-69 Pipe Hangers and Supports – Selection and Application
 - 3. MSS SP-89 Pipe Hangers and Supports – Fabrication and Installation Practices.

PART 2 - PRODUCTS2.1 MATERIALS

- A. Overhead Hangers:
 - 1. For pipes 8 inches in diameter and smaller:
 - a. Adjustable clevis.
 - b. Acceptable manufacturers:
 - (1) Grinnel Co., Fig. 260.
 - (2) Carpenter & Patterson Inc., Fig. 100.
 - (3) Or approved equal.
 - 2. For pipes larger than 8 inches in diameter:
 - a. Single pipe rolls and sockets.
 - b. Acceptable Manufacturers:
 - (1) Grinnel Co., Fig. 171 or 181.
 - (2) Carpenter & Paterson Inc., Fig. 142 or 140.
 - (3) Or approved equal.
 - 3. For insulated pipe use insulation protection shield, Grinnel Co., Fig. 167 or Carpenter & Paterson Inc., Fig. 265P.
 - 4. For copper piping:
 - a. Copper plated malleable iron.
 - b. Acceptable manufacturer:
 - (1) Grinnel Co., Fig. CT-138-R.
 - (2) Carpenter & Paterson Inc., Fig. 81CT.

- (3) Or approved equal.
 5. Threaded hanger rods:
 - a. Right-hand and left-hand machine threads.
 - b. Suspended from beam clamps or galvanized inserts in concrete.
 - c. Acceptable manufacturers:
 - (1) Grinnel Co., Fig. 140 or 253.
 - (2) Carpenter & Paterson Inc., Fig. 133 or Fig. 94.
 - (3) Or approved equal.
- B. Pipe Saddle Supports:
 1. Adjustable type with pipe and floor flanges.
 2. When used under base fittings, substitute matching floor flanges for saddle sections.
 3. Acceptable manufacturers:
 - a. Grinnel Co., Fig. 264.
 - b. Carpenter & Paterson Inc., Fig. 101.
 - c. Or approved equal.
- C. Wall and column supports:
 1. Welded steel brackets with anchor chairs.
 2. Install additional wall bearing plates where required for wall brackets.
 3. Acceptable manufacturers:
 - a. Grinnel Co., Figs. 194, 195, and 199.
 - b. Carpenter & Paterson Inc., Figs. 49, 84 and 139.
 - c. Or approved equal.
- D. Brick and Concrete Piers:
 1. Locate where shown on the Drawings and/or where required for proper support.
 2. Construct piers to accurately conform to the bottom one-third to one-half of the pipe.
- E. Plastic Pipe Hangers:
 1. Plastic coated hangers.
 2. Acceptable manufacturers:
 - a. Grinnel Co., Fig. 97C.
 - b. Carpenter & Paterson Inc., Fig. 800PVC.
 - c. Or approved equal.
- F. Miscellaneous Hangers: Submit shop drawings for review and acceptance by Engineer prior to use.
- G. All additional supports, braces, brackets, etc. which are not specifically described above, but which are required to provide a system in accordance with the applicable paragraphs of this section, shall be provided and installed. Submit all such devices for shop drawing review and acceptance by the Engineer prior to use.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install in accordance with MSS SP-58, MSS SP-69, MSS SP-89 and at a minimum, install hangers, supports, rods, inserts, clamps, brackets, braces, bolts or other supporting devices at all changes in direction and at the end of piping runs. Provide additional devices as required to meet the intent of the specification with respect to support, pitch, vibration, movement, and expansion and contraction.
2. Install all hangers, supports, rods, inserts, clamps, brackets, braces, bolts and other supporting devices of sizes and spacings to prevent loads from exceeding the manufacturer's maximum recommended loading with a safety factor of 5.
3. Provide lock washers or locknuts on hangers, supports, rods, inserts, clamps, brackets, braces, bolts and other supporting devices.
4. Secure hangers to beams or approved concrete inserts where possible.
5. When piping is installed on structural steel supports, provide blocking of pipe rolls to prevent lateral pipe movement.
6. Do not support piping from other pipes or from stairs and walkways.
7. Set all inserts before the concrete is placed.
8. Hangers secured to precast concrete plank construction shall be attached by means of steel plates placed on the upper side of the plank, with the hanger rod extending through the plate and secured by means of a nut and lock washer. The hole in the plank shall be grouted to fill the void through which the hanger rod protrudes in order to distribute the load over the full area of the hanger plate. Plates shall conform to the following schedule.

Size of Pipe Supported (inches)	Plate Thickness (inches)	Minimum Plate Size (inches)
1/2 to 1	3/16	4 x 4
1-1/2 to 2	3/16	5 x 5
2-1/2 to 4	1/4	6 x 6
5 to 6	1/4	10 x 10
Over 6	1/4	12 x 12

B. Expansion and Contraction:

1. Rigidly support all piping with adequate provisions for expansion and contraction.
2. Firmly anchor horizontal runs over 50 feet in length at the midpoint of the runs to force expansion equally toward the ends.

C. Spacing:

1. Install hangers and supports at sufficiently close intervals to maintain alignment and prevent sagging.
2. Maximum spacing of hangers and supports:

<u>Pipe Size (inches)</u>	<u>Spacing (feet)</u>
1 & smaller	6
1-1/4 to 2	9
2-1/2 to 3	11
4 and larger	14
C.I. Soil Pipe (all sizes)	5
P.V.C. (all sizes)	As recommended by manufacturer

Fiberglass

As recommended by manufacturer

- D. Supporting Vertical Piping:
 - 1. Support at each floor level.
 - 2. Support at all points necessary to insure rigid installation with adequate provisions to allow expansion and contraction and prevent vibration.
 - 3. Support by approved pipe collars, clamps, brackets, or wall rests.
- E. Supporting PVC and Fiberglass Piping (when applicable):
 - 1. Support in strict accordance with the manufacturer's instructions and recommendations for the conditions of operation temperature and size of pipe.
 - 2. Support in a manner which will prevent subsequent visible sagging of the pipe between supports due to plastic deformation.
- F. Drain, waste, and vent piping: Support by adjustable hangers.
- G. Valves, Fittings & Specialties: Independently support pipe connected to pumps, equipment and piping systems.
- H. Temporary pipe supports:
 - 1. Lay out each section of pipeline and make connections while the pipe is held in temporary supports.
 - 2. After the completion of connections in each section of pipeline, hold the section in place with temporary clamps.
 - 3. Do not remove the temporary clamps until the piping is correctly installed on the permanent supports.

3.2 TESTING

- A. Demonstrate compliance with the requirements of this section with respect to support, pitch, vibration, movement, and expansion and contraction by operating all pumping, aeration and other systems under simulated operating conditions in the presence of the Engineer. Review demonstration procedures with Engineer sufficiently prior to the actual demonstration to allow incorporation of comments and concerns of the Engineer.
- B. Systems which do not meet the requirements of this section with respect to support, pitch, vibration, movement, and expansion and contraction will be supplemented with additional devices as required and re-demonstrated until compliance is achieved.

END OF SECTION