

SECTION 336029 – HANGERS AND SUPPORTS FOR UTILITY DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

- A. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the Drawings and as specified herein.
- B. This section includes the furnishing and installation of pipe hangers and supports.
- C. Related sections include the following:
 - 1. Division 33 Section "Utility Distribution General Requirements."
 - 2. Division 33 Section "Insulation for Utility Distribution."

1.3 REFERENCES

- A. ASME/ANSI B31.1, Power Piping.
- B. ASME/ANSI B31.9, Building Services Piping.
- C. MSS SP-58, Pipe Hangers and Supports - Materials, Design and Manufacture.
- D. MSS SP-69, Pipe Hangers and Supports - Selection and Application.
- E. MSS SP-89, Pipe Hangers and Supports - Fabrication and Installation Practices.

1.4 SYSTEM DESCRIPTION

- A. Provide necessary hangers, rods, supports, concrete inserts, etc., and proper size angles, channels, or unistruts to support piping in a manner allowing movement during expansion and contraction. These supporting structures shall not be overstressed. Piping shall be supported with approved hangers designed for vertical adjustment and capable of carrying normal loads in all conditions of operation.
- B. Profiles and design calculations are based on the use of Advanced Thermal Systems slides and guides.
 - 1. Revised drawings and calculations shall be submitted by a professional engineer, registered in the state of Michigan for the use of slides and guides by an approved equal.
 - 2. No schedule delays will be allowed for submittal and review of drawings and calculations for the use of alternate systems.

1.5 SUBMITTALS

- A. Product Data for the pipe hangers and supports.

1.6 QUALITY ASSURANCE

- A. Selection and application of pipe hangers and supports shall conform to applicable codes and standards listed in Division 01 and Division 33 Section "Utility Distribution General Requirements", except as otherwise modified and supplemented herein:
 - 1. ASME/ANSI B31.1 and B31.9
 - 2. MSS SP-58
 - 3. MSS SP-69
 - 4. MSS SP-89

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. "Type" designations, where specified, are based on MSS SP-58 and MSS SP-69. Support elements, except for mill rolled supplementary steel, shall be catalogued, load rated, commercially manufactured products.
- B. Supporting elements and hanger rods shall be hot dip galvanized, including threads, for corrosion protection. Fasteners are to be hot dip galvanized or stainless steel.
- C. Use copper plated or plastic coated supporting elements in contact with copper tubing.
- D. Acceptable Manufacturers: Anvil International, Michigan Hanger; or approved equal.

2.2 PIPE HANGERS AND SUPPORTS

- A. Horizontal Piping Hangers: Unless otherwise indicated and except as specified in piping system Specification sections, install the following types:
 - 1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN15 to DN750).
 - 2. Roller Hangers:
 - a. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30 (DN25 to DN750), from 2 rods if longitudinal movement caused by expansion and contraction might occur.
 - b. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20 (DN65 to DN500), from single rod if horizontal movement caused by expansion and contraction might occur.

- B. Vertical Piping Clamps: Unless otherwise indicated and except as specified in piping system specification sections, install the following types:
 - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN20 to DN500).
 - 2. Carbon or Alloy Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN20 to DN500), if longer ends are required for riser clamps.

2.3 HANGER ROD FIXTURES

- A. Use only circular cross-section rod hangers to connect to structural attachments to pipe support devices.
- B. Forced steel turnbuckle Anvil Figure 230 (MSS Type 13) or swivel turnbuckle (MSS Type 15). Rod couplings are not acceptable.

2.4 PIPE COVERING PROTECTION SADDLES

- A. MSS Type 39.
- B. Manufacturer: Anvil International, Michigan Hanger; or approved equal.
- C. Spacing: At each hanger or roller support location.
- D. Sizes: Appropriate for pipe size and insulation thickness:
 - 1. Anvil Figure 162 for 2-inch insulation thickness.
 - 2. Anvil Figure 165 for 4-inch insulation thickness.
- E. Height of saddles will be equal to the thickness of the insulation used.
- F. The contour of the saddle shall match the radius of the pipe insulation and overhang the edges of the outside rollers a maximum of 1/2-inch.
- G. Lengths of saddles shall be as follows:
 - 1. For the first 1/4 of the distance from the anchor to the expansion joint - 25% of design travel length of joint.
 - 2. For the second 1/4 of the distance from the anchor to the expansion joint - 50% of design travel length of joint.
 - 3. For the third 1/4 of the distance from the anchor to the expansion joint - 75% of design travel length of joint.
 - 4. For the last 1/4 of the distance from the anchor to the expansion joint – design travel length of joint + 25% or 100% of the available travel length of the selected joint, whichever is greater.

5. Not less than 12 inches.

2.5 PIPE SLIDES AND GUIDES

A. General Design and Construction

1. Pipe slides and guides shall use a minimum of ½-inch of graphite bearing surface on upper and lower plates with a coefficient of friction of 0.15 or less and a compressive strength of 2000 psi or greater.
2. The graphite shall be both epoxy bonded and mechanically attached to the plate.
3. Pipe slides and guides used outside shall be galvanized.

B. Manufacturer:

1. Advanced Thermal Systems, Inc.
2. As approved by Owner.

C. Model:

1. Figure 101-W for guide weld down applications.
2. Figure 101-B for guide bolt down applications.
3. Figure 201-W for slide weld down applications.
4. Figure 201-B for slide bolt down applications.

D. Location: As indicated on the Drawings.

E. Size: Appropriate for pipe size, insulation thickness and length of travel.

F. Bearing surface for slides and guides must exceed the following percentage of joint design travel by a minimum of 4 inches:

1. For the first 1/4 of the distance from the anchor to the expansion joint - 25% of design travel length of joint.
2. For the second 1/4 of the distance from the anchor to the expansion joint - 50% of design travel length of joint.
3. For the third 1/4 of the distance from the anchor to the expansion joint - 75% of design travel length of joint.
4. For the last 1/4 of the distance from the anchor to the expansion joint – 100% of design travel length of joint.

2.6 FLOOR SUPPORTS

- ### A. Provide as indicated or as needed to comply with requirements.

- B. Support on a concrete housekeeping pad or other approved means to protect against moisture and corrosion.
- C. Anvil Figure No. 62, or equal.

2.7 BUILDING STRUCTURE ATTACHMENTS

- A. Use of “C” clamps and beam clamps of “C” pattern and any modifications thereof is prohibited.
- B. Beam Clamps: Center loading MSS Type 21, 28, 29 and 30. Eccentric loading beam clamps Type 20 may be used when it is not possible to use center loading beam clamps and subject to prior approval by the Engineer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Do not support piping from other piping.
 - 2. Hangers and supports shall also be provided at every change of direction and within 1-foot of any pipe fittings and valves.
- B. Pipe Slides and Guides: Install with full bearing contact between upper and lower plates.
- C. Saddles: Each roller support and hanger shall have a pipe covering and insulation protection saddle.
- D. Hangers:
 - 1. The selection of pipe hangers and supports shall be based on the overall design concept of the piping system and any special requirements which may be called for in these Specifications or as indicated on the Drawings. The support systems shall provide for, and control, the free or intended movement of the piping including its movement in relation to that of the connected equipment. They shall prevent excess stress resulting from the transfer of weight being introduced into the pipe or connected equipment.
 - 2. The selection of hangers and supports shall be made to provide the piping system with the degree of control that its operating characteristics require.
 - 3. The selection of hangers or supports will take into consideration the combined weight of the supported systems, including system contents and test water.
 - 4. Select and install hangers or supports to allow controlled thermal and seismic movement of the piping system, to permit freedom of movement between pipe anchors, and facilitate action of expansion joints, expansion loops, expansion bends and similar units.
 - 5. The spans in MSS SP-69 Table 3 do not apply where concentrated weights, such as valves or heavy fittings, or where changes in direction of the piping occur between hangers.

6. Select all hangers and supports rated for maximum potential loading with pipe full.
7. Use adjustable roller hangers on steam and condensate piping in vaults not supported by pipe stanchions and for steam utility distribution piping located within buildings.
8. Use adjustable clevis hangers where distance from anchor to mid-point of expansion joint exceeds 5 feet, or elsewhere as indicated.

END OF SECTION 336029