

## 5.22.05 - COMMON WORK RESULTS FOR PLUMBING DESIGN AND CONSTRUCTION STANDARD

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### PART 1: GENERAL

#### 1.01 Purpose:

- A. This standard is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. The responsibility of the engineer is to apply the principles of this section such that the University may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be justified through LCC analysis and submitted to the University for approval.

#### 1.02 References:

- A. MSS SP-58 – Pipe Hangers and Supports – Materials, Design, and Manufacture
- B. MSS SP-69 – Pipe Hangers and Supports – Selection and Application.

#### 1.03 Requirements:

##### A. Metering:

- 1. Building utilities are required to be metered including but not limited to: domestic water, and natural gas. Locate hydronic metering equipment inside a machine room. Provide isolation valves to accommodate meter service
- 2. For buildings with mixed occupancy (E&G and non-E&G), provide sub-metering to property allocate utility costs between organizations. Coordinate sub-metering requirements with the University.
- 3. Refer to section 5.23.09 for further utility metering requirements.

##### B. Valves:

- 1. Provide valves with extended stems to be accessible on outside of insulation. Valve body and stem shall be insulated.
- 2. Provide means of access where valves are not exposed.
- 3. Provide valve vaults or boxes, as conditions demand, to provide access to valves installed below grade.
- 4. Valves applied to cold water and piping systems with fluids typically less than ambient temperature shall be constructed with all components exposed to atmosphere of stainless steel or brass. Steel components are not acceptable

##### C. Hangers and Supports:

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1. Design piping systems to utilize pipe hangers, inserts, and supports in conformance with International Mechanical Code, MSS SP-58 and MSS SP-69.
2. Provide hangers fabricated to allow adequate vertical adjustment of 1.5 inches minimum after installation while still supporting the load. The use of pipe hooks, chains, or perforated iron piping for support is prohibited.
3. Support horizontal case iron pipe adjacent to each hub, with a maximum of five feet spacing between hangers. Support vertical case iron pipe at each floor at hub.
4. Provide pipe hangers within 12 inches of each change in direction and provide hangers on both sides of line valves.
5. Provide vertical piping support at each floor with 2-bolt riser clamps. For pipe risers exceeding three floors, evaluate pipe supports for longitudinal expansion and support requirements. Support riser piping independently of connected horizontal piping.
6. Provide four inch high concrete housekeeping pads and equipment bases for floor mounted equipment in mechanical rooms and penthouse equipment rooms. Housekeeping pads shall extend a minimum 6 inches beyond the equipment or supported member in all directions. Provide pads with half-inch chamfer on all exposed edges, placed and finished smooth and level to ensure proper and continuous support for the bearing surfaces of equipment.
7. Provide sleeves for all pipe penetrations through walls, roofs, or floors. Provide sleeves larger than pipe to accommodate insulation thickness. Provide sleeves in non-load bearing surfaces fabricated of galvanized sheet metal and sleeves in load bearing surfaces constructed of uncoated carbon steel pipe. Sleeves shall not be installed in structural members unless specifically approved by the University. Caulk all sleeves water and airtight. Provide UL listed sealant between pipe and sleeve as required by code. Provide escutcheon around penetrations in finished areas.
8. Provide Linkseal (or approved equal) assembly for pipe penetrations through waterproofed floors and walls.
9. Where piping penetrates a floor, ceiling or wall, provide fire stopping insulation, sealed airtight, to close off penetration space between pipe, ductwork, and adjacent work. Provide escutcheon covers at both sides of penetration.
10. Where piping penetrates a fire rated floor, wall, or ceiling, provide fire-safe insulation so that the assembly, when complete, is UL listed and equals the fire rating of constructed penetrated.
11. Provide pumps with concrete-filled, spring-isolated inertia bases installed on top of concrete housekeeping pad.

D. Vibration and Sound Control:

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1. Provide flexible connectors for piping connections to rotating equipment. For pipe systems 2 inches and smaller, provide braided stainless steel flexible connectors. For pipe systems 2 inches and larger, provide Kevlar reinforced rubber, double-sphere flanged flexible connectors.

**PART 2: PRODUCTS**

2.01 Motors:

- A. Refer to Section 5.26.60 for motor standard.

2.02 Valves:

A. Shutoff and Section Valves:

1. 2" and Smaller: Provide ball valves.
2. 2 1/2 or Larger: Provide ball valves or gate valves.

B. Drain Valves:

1. 2" and Smaller: Provide ball valves.
2. 2-1/2" and Larger: Provide gate valves.

C. Check Valves:

1. Provide spring-loaded silent check valves.

**PART 3: EXECUTION**

END OF STANDARD