

230500 Common Work Results For HVAC

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1. GENERAL

- A. **PRODUCT SUBMITTALS:** Prior to installation, Facilities Services requires the review of all Product Submittals selected by the Engineer(s) of Record throughout the design and construction phases of projects. This review is intended to allow Facilities Services to become familiar with maintenance requirements, as well as confirm compliance with the UF Design and Construction Standards.

2. HVAC DESIGN CONDITIONS

- A. **Basis of Design guides** for summer outdoor weather conditions of 96° F DB and 80° F **dew point** shall be used for all HVAC systems.
 - 1. **NOTE:** This requirement is more stringent than ASHRAE design weather.
- B. **Basis of Design** for winter outdoor weather conditions of 29.6° F DB shall be used for all HVAC systems.

3. PIPES AND PIPE FITTINGS

- A. **GENERAL:** All piping systems shall be cleaned, tested, and accepted by Facilities Services prior to being placed in service.
- B. **FERROUS PIPE AND FITTINGS:** Iron pipe installed in a corrosive area shall be wrapped in a plastic approved for those applications.
- C. **GROOVED FITTINGS, VALVES, AND COUPLINGS:** Shall be the product of a single manufacturer and approved for its specific application. Fittings, valves, and couplings must be consistent throughout, with no mismatching of manufacturers.
 - 1. Prefer a factory-direct inspection program provided by a Factory authorized inspector to verify properly installed joints
 - 2. Acceptable Manufacturers: Victaulic, Grinnell, Belimo, Bray.
- D. **PRESS JOINT SYSTEMS (ProPress, Vic-Press, etc.)**
 - 1. Only in Mechanical rooms with drains
 - 2. Allowed Only on HHW and Chilled water pipe 3" 2" and smaller
 - 3. Allowed Can be used on HHW, Chilled Water, on any size HVAC vent and Drain lines
 - 4. Not Allowed on steam piping (pressure or vents).
- E. **PUSH TO CONNECT TYPE SYSTEMS (SharkBites, etc.)**
 - 1. Not allowed

4. PIPING SPECIALTIES

A. Dielectric Waterway (to eliminate galvanic corrosion between dissimilar metals)

1. Dielectric Nipples:
 - a. Shall be used at all junctions of dissimilar metal piping, but as close as possible to the unit it serves.
 - b. Provide isolation valves, on supply side, within 12" of dielectric nipples.
 - c. For potable water service: National Sanitation Foundation (NSF) listed in accordance with ANSI/NSF 61, up to 180 F.
 - d. For chilled water and heating hot water systems: Meet the requirements of ASTM F-492-77, temperatures up to 230 F and pressures up to 300 psi.
2. Dielectric Flange Kits:
 - a. Shall be used at all junctions of dissimilar metal piping (I.e. when joining copper and steel flanges together.)
 - b. Type D,E,F and O flange kits will consist of gasket, isolation sleeves and washers.
 - c. Select correct gasket material, dielectric strength, water absorption and maximum temperature to be compatible for each system it is applied to.
3. When joining copper to steel flanges together, CTS Copper Flange Kits are acceptable.
4. Dielectric unions are unacceptable.

5. VALVES

A. CHILLED, CONDENSER, AND HEATING HOT WATER:

1. General
 - a. All gate and butterfly valves, that are manually operated, and located out of reach will require gear boxes with chains 6' off finished floor.
2. Combination valves
 - a. Triple duty (check, balancing, shut-off) valves are not acceptable for chilled water, heating hot water, and condenser water applications.
 - b. Pre-manufactured flow control devices, Combination Valves, Valve Assemblies (that include shutoff, strainer, test ports, balancing, etc.) are not preferred for use on HVAC piping systems.
 - a. If they are used they must have separate ball valves installed on the upstream side of the supply pipe and the downstream side of the return pipe from the combination valves.
3. Gate Valves:
 - a. Up to 2": Bronze, rising stem with split wedge gate.
 - b. 2^{1/2}" and Above: Iron, rising stem.
 - c. Acceptable Manufacturers: Dezurik, Nibco, Stockham, Bray.
4. Butterfly Valves
 - a. 150 psi WOG for 2" to 12"
 - b. 200 psi WOG for 14" to 24"
5. Check Valves
 - a. Swing Check
 - a. Up to 2" diameter: Bronze body, Y type, Threaded 300 WOG or 150 SWP
 - b. 2 1/2" thru 12 diameter: Iron, Spring loaded (non slam), flanged

- b. Wafer Check:
 - a. 2" thru 24", Body CI,DI, Carbon Steel, Stainless Steel, spring loaded –double disc design- wafer or lug style body-soft seat.

6. Balancing Valves

- a. Balancing valves are not considered isolation valves. A full open valve along with a union must be installed upstream of the balancing valve for maintenance.
- b. Balancing valves shall be installed in all Chilled Water, Heating Hot Water and Condenser Water piping and are to be Industrial grade or greater.
- c. Balancing valves are not needed or desired on the discharge side of variable speed controlled pumps.
- d. Settings for all balancing valves shall be permanently marked (not with pencil or felt pen).
- e. Quarter-turn products that possess non-linear flow control characteristic curves shall not be used for manual balancing that requires precise positioning. Manual balancing valves shall be of a multi-turn, Y-pattern globe design that provide linear controllability
- f. Up to 2": Bronze body.
- g. 2^{1/2}" and Above: Iron body.

7. Ball Valves: Preferred where appropriate, and shall be as follows:

- a. Full port. (2 piece, 600psi WOG, 150psi WSP, with adjustable packing gland)
- b. Stainless Steel ball and trim.
- c. Blow-out proof stem.
- d. Ball valves will be used for pipe 2.5" diameter and less.
 - a. Consider Butterfly valves for any valve above 2.5" diameter.

B. STEAM VALVES

1. Pressure Reducing Valves:

- a. Up to 2": Cast iron body, union connection, pilot operated, with stainless steel trim.
- b. 2 1/2" and Above: Carbon steel body, flanged pattern, pilot operated, single seated, and stainless steel trim.
- c. Steam PRV valves shall have the following
 - a. Diaphragms
 - i. 2 ply construction
 - ii. Stainless steel

- iii. Dual flex points
 - b. Seats
 - i. The bottom seat must be replaceable
 - ii. The plug and valve seats shall have the ability to be lapped in place
 - d. Acceptable Manufacture: Fisher, Hoffman, Spence, Spirax Sarco
- 2. Gate and Ball Valves:
 - a. Up to 2": Bronze, rising stem with split wedge gate.
 - b. 2 1/2" and Above: Iron, rising stem.
 - c. All Steam Gate Valves: All gate valve used on steam lines shall be listed for steam use and be Class 150 valves. Valves listed for Water, Oil or Gas use are not allowed on Steam systems.

C. ISOLATION VALVES

- 1. Provide isolation valves at the beginning of each branch piping takeoff in vertical CHW, HHW, DHW, DCW, and Gas piping risers on both the supply and return pipes.
- 2. Provide isolation valves for each CHW, HHW, DHW, DCW, and Gas riser on both the supply and return pipes. Location of riser isolation valves will be directly after the riser takeoff from the main piping within the building and readily accessible for operating.
- 3. Provide isolation valves on both the supply and return piping for all equipment which includes Chillers, Pumps, Air Handler Heating and Cooling Coils, Steam Heat Exchangers, Fan Coil Units, Re-heat Coils, Variable Air Volume Terminal Boxes (VAV) etc.

6. MECHANICAL ROOMS

- A. STANDARDIZATION OF FLOOR PLAN: All mechanical rooms in new or renovated buildings shall have the same basic floor plan (equipment layout), as practical. Vertical alignment of mechanical rooms within new buildings is preferred, where practical.
- B. PIPING AND COMPONENT DIAGRAM: All mechanical rooms shall be designed to facilitate the installation of components in a serviceable manner. Complete piping and component diagrams shall be included in the construction documents to verify that the design intent is constructible and maintainable.
- C. COORDINATION DRAWINGS: The Builder shall submit coordination drawings assuring that the various components the Builder intends to install in mechanical rooms will result in a serviceable installation. These drawings shall be provided to the Facilities Services Division for review.
- D. SERVICEABILITY: Clearances suggested by manufacturers for equipment maintenance, removal, or replacement shall be indicated on the coordination drawings and accommodated by the layout. Larger and heavier components that may require future removal or replacement shall be identified on coordination drawings and a clear path identified to the building exterior. Door sizes, lifting supports,

and other pertinent information shall be identified on coordination drawings. All components (cleanouts, shut-off valves, floor drains, pumps, etc.) shall have at least 24" to 36" of radial room around them to allow for maintenance access. All equipment access shall be provided within the equipment room.

- E. FREIGHT ELEVATOR: Mechanical rooms not located on the floor that is at grade shall have access to a freight elevator. Penthouses where HVAC equipment is located shall be accessed by a freight elevator. Any building with an air handling unit located on the roof shall have a freight elevator that exits directly onto the roof.
- F. FLOOR DRAINS: Provide drains and drain piping that is adequately sized to accommodate water volume when testing as well as normal service loads in all mechanical rooms.
 - a. Chases that penetrate floors in mechanical rooms shall be protected by poured in place concrete curbs.

END OF DOCUMENT