

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

GENERAL MECHANICAL REQUIREMENTS

A. Humidifiers:

1. Humidifiers shall be indirect steam to steam. Acceptable manufacturer is Dri-Steem or owner approved equal. No direct steam or electric.

B. Domestic Water:

1. Domestic water booster pumps and circulation pumps shall be Bell & Gosset (preferred), Tigerflow or Burks.
2. Domestic hot water heaters shall be the instantaneous type.
3. Water piping shall as follows:
 - a. Above Grade: Copper tubing ASTM B88, Type L, hard drawn.
 - b. Below Grade: Copper tubing ASTM B88, Type K, hard drawn.

C. Heating Systems

1. Heating Hot Water Systems and Chilled Water Systems shall include an Isolation Valve, Pressure Gauge and an Air Bleed at the highest very end of the heating/cooling system piping.
2. Expansion tanks in Heating Hot Water systems shall be bladder type.
3. Piping shall be Copper tubing ASTM B88, Type L, hard drawn (above grade).
4. Circulating pumps and booster pumps shall be Bell & Gosset (preferred) or Burks.
5. Tube bundles in heater exchangers shall be Bell & Gosset.
6. Air Vents shall be Spiro and shall be constructed with an isolation valve.
7. CMU requires that steam is the source of heat for all heating systems; and that coils in air handlers utilize water heated via a steam-water exchanger. Exceptions must be approved by the Director of Plant Engineering and Planning and the Director of Energy and Utilities.

D. Water Purification:

1. Domestic water softener system shall be reverse osmosis with active carbon filter. Acceptable manufacturers are Altar or Fliers.

E. Chilled Water

1. CMU requires that all building air conditioning utilize the campus chilled water system; and where possible use outside air, in lieu of chilled water, from December 1 to April 1. The need for exceptions is recognized but must be approved by the Director of Plant Engineering and Planning and the Director of Energy and Utilities.

2. **NO** hot tapping of the campus chilled water lines. All connections to the campus chilled water lines shall be done utilizing the appropriated sized “tee” connection.
3. Chilled water tie-ins to the campus chilled water mains shall be completed between November 1 and April 1.
4. Chilled water lines shall not be routed in the tunnels.
5. See “CMU CHILLED WATER VALVING STANDARD” drawing for valve configuration for new building connections to the campus chilled water system.

F. Miscellaneous (General):

1. All insulated pipe shall have hard block insulation between the hanger and the pipe.
2. Sleeves thru floors and walls shall be sized so that the required pipe insulation is continuous thru the sleeve.
3. Floor sleeves shall project 1” above the Finish Floor.
4. No Mechanical Vents for drains shall be allowed. (Examples of unacceptable Manufacturers are: Studer and Otey).
5. All Ball Valves shall be the full port type.
6. Drain piping shall be PVC Schedule 40 if temperature is less than 140 degrees Fahrenheit.
7. HVAC Interior duct insulation shall be a closed cell type such as ToughGard™ R Duct Liner with Enhanced Surface manufactured by CertainTeed, or owner approved equal.
8. There shall be NO splices to the snow melt coils. This system shall be inspected by the CMU project manager or designee prior to placing of concrete.
9. All VAV boxes shall be located in the hallway at a height for maintenance access from a ladder. In addition all VAV boxes shall be labeled in the field and noted on “Record Drawing”. All sensor location shall be noted on “Record Drawing”.
10. All hidden valves shall be labeled and noted on the “Record Drawings”. The location of these valves shall also be labeled in the field.
11. Air intake shafts shall not be located near smoking areas, exhaust vents or near gas generators.
12. Tap settings shall be marked “Summer” for summer setting and “Winter” for winter setting.
13. The secondary Hot Water System shall be cleaned and chemically passivated prior to charging the system. This shall be checked by the commissioning agent.

14. All refrigeration unit construction and repair shall have the following test performed and witnessed by the CMU project manager or designee.
 - a. Pump the system down to 500 microns vacuum.
 - b. Shut off the vacuum pump shutoff (assured system is sealed).
 - c. System must hold 500 microns vacuum for 15 minutes.
15. A/E firms shall provide a list of local representatives for vendors not included in CMU Standards.
16. **NO** air pressure test over 15 pounds shall be allowed.
17. Vibration transducers shall be installed on all new rotating equipment to allow monitoring.
18. All buried utility lines shall be a minimum of 4" to allow for cleaning and sleeving in the future.
19. Clean-outs shall be required as per the current plumbing code. However, CMU reserves the right to reduce the minimum distance between clean-outs.
20. Shower valves shall be temperature compensating pressure.
21. When ever practical kitchen equipment should utilized steam as the source of heat. Examples include dishwashers and kettles.
22. When designing hood systems there shall be a 1:1 correlation between vent and make-up air systems

G. Heating and Air Conditioning Temperture Set Points:

1. Lower thermostats in the winter to 68 degrees during occupied periods and 64 degrees during unoccupied periods. Raise thermostats in the summer to 76 degrees during occupied periods and turn off air conditioning during unoccupied periods.

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Revision History:

Date	Revision	Approved By:
1.24.07	Clarification of the type of copper tubing to be used above grade and below grade. Included an additional booster pump manufacturer (Tigerflow). Converted to CSI 2004 format.	Steve Lawrence
12.17.07	Inserted Chilled Water System requirements and additional Miscellaneous (General) requirements	Steve Lawrence
2.22.08	Revised section E.1; Inserted into section C item 7; Inserted into section F items 21 and 22	Steve Lawrence