Plumbing/Fire Protection Design Guidelines

Beth Israel Deaconess Medical Center

These guidelines are required as a part of the design basis for all Plumbing systems designed for Beth Israel Deaconess Medical Center. Where applicable codes conflict with these guidelines, the code shall supersede these requirements. Any deviation from these requirements should be brought to the attention of the Facilities Engineering Dept. during review, with an explanation why it is required, or how it improves the system.

I. Review Documents

1.1. BIDMC review

1.1.1. Provide documents for review at Schematic, Design Development and Construction Documents phases. This information will be reviewed and comments will be prepared by BIDMC personnel within 3 weeks of submission, or as coordinated by the BIDMC Project Manager.

1.2. Design intent document

1.2.1. Provide a description of the project, updated at each stage of design, including:

a. Applicable codes and standards
b. Design conditions
c. occupancy and usage
d. occupancy schedule
e. Load calculations
f. Service and maintenance requirements
g. Acoustics and air quality requirements
h. Energy conservation and sustainable design requirements
i. Commissioning requirements
j. Summary of control sequence
k. System flows, temperatures and pressures

1.3. Design drawings and specifications

1.3.1. Provide drawings and specifications at each stage of design, as appropriate.

1.3.2. Show location of connections to existing systems at each stage of design.

1.3.3. Provide a list of required submittals as part of the design documents.

1.4. Utility impact analysis

1.4.1. Provide calculation of net utility usage required from existing building systems at all phases of design.

1.4.2. Provide analysis of existing systems or cite other sources, showing sufficient capacity of existing utilities.

II. PLUMBING & FIRE PROTECTION

1. Systems

1.1. Cold and Hot Potable water
1.2. Cold and Hot Non-potable water
1.3. Fire protection
1.4. Steam/Condensate service and distribution
1.5. Natural Gas
1.6. Sanitary drainage
1.7. Laboratory (Industrial) drainage
1.8. Medical Gases
    1.8.1. Oxygen
    1.8.2. Nitrogen
    1.8.3. Medical Air
    1.8.4. Medical Vacuum
    1.8.5. Nitrous Oxide

2. Matching equipment and systems

2.1. New Construction and Renovations
    2.1.1. Equipment and systems may be based on the approved manufacturer list (below)

3. System Selection

3.1. System selection and criteria
    3.1.1. Type of piping system shall be reviewed with Facilities Engineering during the conceptual design phase.
    3.1.2. Energy efficiency features, including heat recovery, should be considered in the design and included where they can be shown to have a reasonable financial payback.
    3.1.3. In renovations of existing systems, new work shall be consistent with the design of the original system

4. Piping Materials

4.1. General

4.1.1. Specify solid brass cap at all drain and blow-off valves.

4.2. Potable and non-potable water

4.2.1. Type L Copper tubing, hard temper, ASTM B88-78. Wrought copper Fittings, ASTM B16.22. Soldered joints with lead free solder. Pro-press is not permitted.

4.2.2. 4" – 14: Sch. 40 Black Steel, with grooved, flanged or welded joints

4.2.3. Pro-press fittings shall not be allowed.

4.3. Fire Protection

4.3.1. 2" and smaller: Sch. 40 Black Steel, with threaded joints

4.3.2. 2-1/2" and larger: Sch. 40 Black Steel, with threaded, grooved, flanged or welded joints

4.4. Steam

4.4.1. 2" and smaller: Sch. 40 Carbon Steel. ANSI B36.10 ASTM A120, threaded, class 150 malleable iron fittings

4.4.2. 2-1/2" through 10": Sch. 40 Carbon Steel, welded.

4.5. Condensate

4.5.1. 2" and smaller: Sch. 80 Carbon Steel. ANSI B36.10 ASTM A53 grade A, threaded, class 150 malleable iron fittings

4.5.2. 2-1/2" through 4": Sch. 80 Carbon Steel, A106 Grade B Seamless, butt welded fittings

4.6. Natural Gas

4.6.1. Sch. 40 Black Steel, with threaded, flanged or welded joints

4.7. Sanitary Drain & Vent

4.7.1. 3" and smaller: Type DWV copper with soldered fittings

4.8. Lab (Industrial) Drain & Vent

4.8.1. Enfusion Polypropylene fire resistant pipe

4.9. Medical Gas

4.9.1. per NFPA 99, latest edition.

5. Insulation

5.1. Provide fiberglass insulation with all-service jacket in ceilings and walls.

5.2. Provide fiberglass insulation with 16-mil aluminum jacket in mechanical rooms and where subject to traffic

5.3. Provide removable, fitted insulation jackets on fittings that require service.

5.4. Labels and flow-direction arrows on insulation shall be color coded per code, and as follows, where not directed by code:

5.4.1. Steam/Condensate: White
5.4.2. Heating Hot water: Orange
5.4.3. Chilled Water: Blue
5.4.4. Potable Water: Green
5.4.5. Non-potable water: Yellow
5.4.6. Vent piping: Black
5.4.7. Natural Gas: Yellow
5.4.8. Fuel Oil: Yellow
5.4.9. Fire Protection: Red

6. Motors and Variable Speed Drives

6.1. Provide premium efficiency motors for all applications.

6.2. Where variable speed drives are used, provide motors with ceramic bearings specifically designed for use with variable speed drives.

6.3. Variable speed drives shall be capable of direct interface with DDC control system

7. Approved Manufacturers

7.1. Backflow preventers: Watts type 909

7.2. Ball Valves: Apollo (only)

7.3. Faucets: Chicago Faucet

7.4. Medical air and Vacuum: Beacon-Medaes

7.5. Thermostatic mixing valves: Symmons, with check stops

7.6. Toilets: American Standard, Toto

7.6.1. Flush Valves: Toto manual flush

7.7. Urinals: American Standard, Toto

7.7.1. Flush valves: Toto automatic flush

7.8. Water heaters: Patterson Kelley instantaneous steam

8. Penetrations

8.1. Sleeves shall be provided for all floor and wall penetrations

8.2. Use UL-rated sealing system by Hilti (see BIDMC standard for Through-Penetration Stop Systems)

8.3. Specify utility mapping prior to coring floors, where there is a possibility of in-slab conduit

9. Accessibility

Design layout shall allow for maintenance and replacement access to new equipment and free access to existing systems

10. Motors

10.1. Provide premium efficiency motors for all applications.

10.2. Where variable speed drives are used, provide motors with ceramic bearings specifically designed for use with variable speed drives.

10.3. Variable speed drives shall be capable of direct interface with DDC control system

11. Controls

11.1.1. Industrial waste alarms

a. Comtronics

11.1.2. Medical Gas alarms and manifolds

a. Beacon-Medaes

11.1.3. Other Alarms

a. Siemens Apogee RENO system