SECTION 15001.C – PLUMBING

1. Related requirements
   a. Separate requirements (for example, other Division 15 work, Division 16 work, energy performance, and general conditions) relate to and may limit choices in plumbing system design, construction, and maintenance.
   b. Life-cycle costs shall not be increased to lower first costs. Water conservation, energy efficiency, reliability, operability, maintainability, expected service life, and future replacement costs shall be taken as factors in determining life-cycle costs, with unit costs for these and any other factors to be as directed by Brown University Project Manager.
   c. All equipment shall show service clearances, tube pulls, shaft pulls, and other clearances per manufacturer’s requirements and drawings as crosshatched areas on drawings. [15400 sections, M & P drawings]

2. General
   a. Plumbing equipment shall be configured to allow other Brown University standards’ requirements to be met. [All sections]
   b. Operating and Maintenance procedures shall be provided in Owner-approved format compatible with FAMIS software and shall include detailed PM schedules, PM procedures, and baseline performance measurements for use in troubleshooting, re-commissioning or retrocommissioning, engineering, and cost analyses. [01780, 01820, 01830 sections]
   c. Brown University utilizes city mains to provide water, sewer, and storm services to each building individually, typically. Each building shall have separate connections to city water, sewer, and storm mains with individual water meters for each building. [02000 sections]
   d. For critical buildings, water supply redundancy shall be provided if directed by Brown University Project Manager. [02500 sections]
   e. Relevant energy rebate requirements shall be incorporated into all work and project requirements.
   f. Bubbler or other water treatment injection connections shall be shown on all plumbing drawings including the location and arrangement of the associated backflow preventer. [02550, 15180, 15460 sections]
   g. All pipe and equipment insulation shall be configured and placed in such a way that it does not interfere with the installation or removal of serviceable plumbing components including meters and valves. [15060 sections]
   h. All pipe and equipment supports shall be placed in such a way that they do not interfere with the installation or removal of serviceable plumbing components including meters and valves. [15060 sections]

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1 Listing of related sections is for convenience and is not all-inclusive. Affected sections or drawings where specific design requirements are to be specified, or related sections where applicable Brown University Design and Construction Guidelines may appear, are indicated in brackets [ ]. 15400 sections means all related 15400 sections including any sections from 15400 through 15499.
i. Valve chart requirements apply to plumbing valves including water, gases, and other systems. [Sections 15075 – 15079]

j. Schedule 10 piping is not allowed. [15100, 15200, 15300 sections]

k. Type M copper is not allowed. [15100, 15200, 15300 sections]

l. Stay-brite soldering is allowed in lieu of brazing with stick silver on copper lines 3½” and less, where appropriate. [15100, 15200, 15300 sections]

m. Design new shower systems to permit mixing of hot and cold water near the showerhead; the warm water section of pipe between the control valve and the showerhead shall be self-draining. [15140 sections]

n. PVC is not allowed for primary roof drains in noise-sensitive buildings including academic, research, library, performing arts, residential, or administrative buildings. [15160 sections]

o. Condensate drain connections or terminations shall be shown on plumbing drawings including all associated protection against freezing and dry traps. [15180 sections]

p. Variable speed drives are typically preferred to pump impeller trimming. [15100, 15200, 15300, 15400 and 16000 sections]

q. Use full gaskets on all flanged connections. [15100, 15200, 15300 sections]

r. For new construction, single manufacturers for each equipment category, such as fixtures, faucets, accessories, equipment, shall be used. [15400 sections]

s. Taco pumps are preferred where suited to application, except use Amtrol for bladder tank/booster pumps. [15400 sections]

t. Use Amtrol expansion tanks and bladder tank/booster pump sets. [15400 sections]

u. Touchless, hard-wired flush valves are required on urinals in multiple user bathrooms only, and are prohibited on toilets and sinks. [15410 sections]

v. Connections of ejector pumps or other powered plumbing-related equipment to emergency power shall be as directed by the Brown University Project Manager, and shall be specified in design documents at all project stages. [15440, 16000 sections]

3. Smaller Buildings (under 10,000 square feet)

a. Annual water usage estimates are always required for buildings or projects with high water use, that is, where annual water and sewer costs are expected to be over $0.15 per gross square foot. For spaces or buildings under 10,000 square feet, annual usage estimates are required where requested by the Brown University Project Manager to evaluate any competing water and cost saving design alternatives.

4. Larger Buildings & Projects (10,000 square feet and over)

a. Plumbing systems for spaces or buildings over 10,000 square feet require annual usage estimates to be made and modified to evaluate any competing water and cost saving design alternatives.

b. Isolating or “sectionalizing” valves are required to permit drain and service of limited building areas. [15100, 15200, 15300 sections]
5. Existing Buildings
   a. Replacement and upgrade fixtures shall match existing fixtures to the extent possible, unless otherwise directed by Brown University Project Manager. [15400 sections]
   b. Complete, unified valve charts with tags on plumbing main, branch, and riser valves are required on all projects. New, separate partial valve charts covering only the project scope are not allowed, unless the project scope or value and unchanged use would not trigger loss of code “grandfathering.” [Sections 15075 – 15079]
   c. Any deviations from Brown University Guidelines thought to be required by space limitations or other factors require written permission from Brown University Project Manager.

6. New Buildings
   a. Complete valve charts with tags on plumbing main, branch, and riser valves are required on all projects. [Sections 15075 – 15079]
   b. Laboratories & Research Facilities
      i. Plumbing systems shall conform to NIH guidelines except for specific provisions where Brown University has verified in writing that provisions do not apply, e.g., multiple species provisions where single species space is being built. [11600, 11700, 12500, 15100, 15200, 15300, 15400 sections]
      ii. Vivaria plumbing systems shall conform to the AAALAC Guide, latest edition. [11600, 11700, 12300, 12500, 15100, 15200, 15300, 15400 sections]
      iii. Provide minimum 7” clearance behind all lab casework to permit plumbing service. [11600, 11700, 12300, 12500, 15100, 15200, 15300, 15400 sections]
      iv. No plumbing devices requiring scheduled preventive maintenance shall be located in or above drop ceilings in laboratory space, except devices associated with fume hoods, snorkels, biosafety cabinets, tissue culture hoods, or other laboratory equipment that cannot be located adjacent to space without diminishing research functionality. [11600, 11700, 12300, 12500, 15100, 15200, 15300, 15400 sections]