PLUMBING SYSTEMS

NARRATIVE REPORT

The following is the Plumbing System Narrative which defines the scope of work and capacities of the Plumbing System as well as the Basis of Design. The Plumbing Systems shall be designed and constructed for LEED for Schools where indicated on this narrative.

1. CODES
   A. All work installed under Section 220000 shall comply with the MA Building Code, IBC 2009, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT
   A. The work of Section 220000 is shown on the drawings and specifications. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. GENERAL
   A. The plumbing systems that will serve the project are cold water, sanitary waste and vent system, grease waste system, special waste system, storm drain system, and natural gas system.
   B. The new building will be serviced by a new municipal water service. The sewerage system will be connected to the existing municipal system.
   C. All plumbing in the building will conform to accessibility codes and to water conserving sections of the plumbing code.
   D. Installation of all work is to be coordinated with the phasing plans for the project.

4. DRAINAGE SYSTEM
   A. Soil, waste, and vent piping system is provided to connect to all fixtures and equipment. System runs from 10 ft. outside the building and terminates with stack vents through the roof.
   B. A separate grease waste system starting with connection to an exterior concrete grease interceptor running thru the kitchen and servery area fixtures and terminating with a vent terminal through the roof. The grease interceptor is provided under Division 33 scope.
   C. Storm drainage system is provided to drain all flat roofs with roof drains piped through the building to a point 10 ft. outside the building. Under drain piping (if necessary) is to be provided to a point 10 ft. outside the building. The pre-cast drainage structures are to be provided under Division 33 scope.
D. Drainage systems piping will be service weight cast iron piping; hub and spigot with gaskets for below grade; no hub with gaskets, bands and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type ‘L’ copper.

E. A separate special waste system shall be provided starting with a connection to an exterior limestone chip acid neutralizer, running thru the building and to the boiler room to collect condensate wastes, and science classroom fixtures terminating with vent terminals through the roof. Special waste and vent piping will be Schedule 40 electric heat fused polypropylene piping, fittings and traps, flame retardant above grade and non-flame retardant below ground.

5. WATER SYSTEM

A. A 4 in. domestic water service from the municipal water system will be provided to the building. A meter, strainer and backflow preventer (if required) will be provided.

B. Cold and hot water distribution piping will be provided. New reduced pressure backflow preventers will be provided on the hot and cold water supply to the science area for cross connection protection as required by code. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

C. Domestic hot water heating will be provided by two high efficiency natural gas fired water heaters with storage tank and a thermostatically controlled mixing device to control water temperature to the fixtures.

D. Water temperature will be 140 deg. to serve the kitchen and 120 deg. to serve general use fixtures. A pump will recirculate hot water from the piping system loop for each temperature system.

E. Water piping will be type ‘L’ copper with wrot copper sweat fittings, silver solder. All piping will be insulated with 1 in. thick high density fiberglass.

F. A new tepid (70 deg. F – 90 deg. F) water loop will be provided to the emergency shower/eyewash fixtures as required by code. This loop will be circulated.

6. NATURAL GAS SYSTEM

A. Natural gas service will be provided for the building and will serve the heating boilers, domestic water heater, science classrooms, rooftop equipment, kitchen cooking equipment, and generator. The new gas service will be routed around the building to the mechanical room area.

B. Gas piping will be Schedule 40 black steel pipe with threaded gas pattern malleable fittings for 2 in. and under and butt welded fittings for 2½ in. and larger.

7. FIXTURES LEED for Schools WE Credit 3

A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.
B. Fixtures shall be the manufacturer’s guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer’s symbol signifying acid resisting material.

C. Vitreous china and acid resisting enameled fixtures, including stops, supplies and traps shall be of one manufacturer by Kohler, American Standard, Eljer, or equal. Supports shall be Zurn, Smith, Josam or equal. All fixtures shall be white. Faucets shall be Speakman, Chicago, or equal.

D. Fixtures shall be as scheduled on drawings.

1. **Water Closet**: Sloan High efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet, sensor operated 1.28 gallon per flush-flush valve.

2. **Urinal**: Sloan sensor operated .13 gallon flush valve urinal, wall hung, and vitreous china.

3. **Lavatory**: Wall hung/countertop ADA lavatory. Infra-red, sensor mixing faucet.

4. **Sink**: Elkay ADA stainless steel countertop sink with Chicago 201A faucet. Sediment traps are to be provided art, ceramics and shop areas.

5. **Drinking Fountain**: Halsey Taylor hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.

6. **Janitor Sink**: 24 x 24 x 10 Terrazzo mop receptor Stern-Williams or equal.


E. Laboratory Fixtures

1. Fixtures water supply shall incorporate low-flow water devices.

2. Laboratory sinks shall be integral to the casework.

3. Laboratory brass gas, water supplies/ bench services shall be of one manufacturer.

4. Gas, water/service connections shall be to pre-piped fume hoods.

8. **DRAINS**

A. Drains are cast iron, caulked outlets, nickaloy strainers, and in waterproofed areas and roofs shall have galvanized iron clamping rings with 6 lb. lead flashings to bond 9 in. in all directions. Drains shall be Smith, Zurn, Josam, or equal.

9. **VALVES**

A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.
10. INSULATION
   A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP, 850 degrees snap-on system.

11. CLEANOUTS
   A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

12. ACCESS DOORS
   A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

13. WATER HEATER
   A. Natural gas fired, condensing, high efficiency units with storage tank.