 <b>HARVARD</b> MEDICAL SCHOOL	<b>FACILITIES DESIGN STANDARD</b> <b>CONSTRUCTION/RENOVATION</b>	<b>SOP #:</b> HMS_DS_PLUMBING_EBS_170527
<b>TITLE:</b> Division 22 Plumbing – Existing Building Systems		<b>REVISION:</b> May 27, 2017


## 22 0510 – Existing Building Plumbing Systems Description

### 1. Armenise Building

- a. 4" Domestic Water service
  - i. Booster pump
- b. Hot Water Generation
  - i. Steam-fired heater
- c. 4" Non-Domestic System
  - i. Steam-fired non-domestic heater
- d. 8" Sanitary Sewer
- e. 6" Storm Sewer
- f. 4" Natural Gas Service
  - i. Gas Booster Pump
- g. RO System
- h. Lab Air System
- i. Lab Waste System which is piped to Goldenson
- j. Vacuum System
- k. CO<sub>2</sub> Tank Farm

### 2. Building C

- a. 3" Domestic Service
- b. Three (3) heaters in basement
- c. Non-Potable Water System
- d. 4" Sanitary (ejected) 3" PD – 5" Sanitary
- e. 5" Storm
- f. 4" Natural Gas System (meter located in Basement)

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- g. 4" Laboratory Waste System
  - i. Pumping Station to TEMC
- h. Compressed Air System
- i. Vacuum System
- j. 1-1/2" ROS and ROR System (located in Basement)
- k. RO Systems for frog area on 7th Floor
- l. 2" Tempered Water System
- 3. Countway Library
  - a. 6" Domestic Water Service
  - b. Hot water heater located in Basement
  - c. 8" Storm Sewer
  - d. 6" Sanitary Sewer
    - i. Sewer Ejector
- 4. Goldenson Building
  - a. Two (2) 6" Domestic Water Services in Basement
    - i. Duplex 3" CW Backflow Preventors – 2 sets
    - ii. Potable Heater located in Basement
  - b. Non-Domestic Water (two 6" Backflow Preventors) – 2 sets
  - c. 5" Sanitary Sewer (6" Sanitary Sewer)
  - d. RO Water System (located in Penthouse)
  - e. CA System
  - f. CO<sub>2</sub> System
  - g. Laboratory Waste System, Pump Station (located in Basement)
  - h. High Pressure Air Main / Riser




5. Gordon Hall

- a. 2" CW, 1" HW, 1-1/2" HWR risers, ground floor, fed from tunnel below.
- b. Lab Waste Neutralization Tank in Basement (30 gallon) above ceiling, 3" AW-UP
- c. Lab Waste Neutralization Tank in second floor above ceiling in kitchen (30 gallon)

6. Harvard Institutes of Medicine (HIM)

- a. Incoming Water Service or Source
  - i. Triplex booster pumps
- b. Hot Water Generation
  - i. Duplex domestic water heaters located in basement
- c. Duplex non-domestic water heaters located in basement
- d. 15" storm drain
- e. 10" storm drain
- f. 12" sanitary sewer
- g. RO System located in basement
- h. Duplex vacuum pumps – Mezzanine Level
- i. Triplex air compressors – Mezzanine Level
- j. 4" gas service
- k. Lab Waste System located in basement
  - i. Two (2) 800 gallon pH adjustment tanks
- l. CO<sub>2</sub>
- m. Helium
- n. Nitrogen
- o. Nitrous Oxide
- p. Oxygen

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- q. Special Gas
- r. WAGD (Waste Anesthesia Gas Disposal)
- 7. Laboratory for Human Reproduction and Reproductive Biology (LHRRB)
  - a. 4" CW service
    - i. Booster pump in basement
    - ii. Hot water heater in basement
  - b. 6" storm sewer
  - c. 6" sanitary sewer
    - i. pH System in basement
  - d. Lab Waste System
    - i. pH System in basement
  - e. Natural Gas System
  - f. RODI System
  - g. CO<sub>2</sub> System
- 8. New Research Building (NRB)
  - a. 6" CW services (low, high zone)
    - i. Domestic water heater in chiller vault
    - ii. Non-domestic water heater in chiller vault
  - b. Three (3) 12" storm sewer
  - c. Two (2) 8" sanitary sewer
  - d. One (1) 6" sanitary sewer
  - e. RODI System
  - f. LA System
  - g. LV System



- h. Lab Waste System (pH Tank System)

9. Seeley G. Mudd

- a. 4" CW service
  - i. Booster pump in basement
- b. 4" G services
- c. 10" sanitary sewer
- d. 8" storm
- e. 10" storm to manhole
- f. LV System
- g. LA System
- h. Lab waste system
- i. Nitrogen system

10. Tosteson Medical Education Center (TMEC)

- a. 4" domestic service (HW, HWR) in basement
- b. Lab waste system (tank in basement)
- c. Natural Gas
- d. 8" sanitary sewer
- e. 12" storm sewer
- f. LA System (compressed air in basement)

11. Vanderbilt Hall

- a. 4" domestic water service and 3" cold water from tunnel
  - i. Triplex domestic booster pump
  - ii. Backflow preventer
- b. Duplex steam-fired water heaters 120°F



- i. 3" hot water
  - ii. 1-1/2" hot water circulation
  - iii. 2" 140°F HW
  - iv. 140°F HW circulation
  - v. Duplex 120°F circulation pumps
  - vi. Duplex 140°F circulation pumps
  - vii. Master mixing valve
- c. 3" Gas from tunnel
- d. 6" sanitary sewer to exterior grease trap
- e. 6" sanitary sewer
- f. Multiple 4" building sanitary sewers
- g. 5" sanitary sewer
- h. 10" storm sewer
- i. 6" storm sewer
  - i. Two (2) sets of sump pumps

## 12. Warren Alpert Building

- a. 6" Domestic Water Service
  - i. Duplex 4" reduced pressure backflow preventers – containment
  - ii. Duplex steam-fired domestic water heaters
- b. Duplex 4" Non-Domestic Reduced Pressure Backflow Preventers
  - i. Duplex steam-fired non-domestic water heaters
  - ii. Non-domestic circulation pumps
- c. 4" Natural Gas Service
- d. Tempered Water System





- i. Tempered water storage tank
  - e. 12" Sanitary Sewer
  - f. pH Neutralization System
    - i. Duplex lab waste pumping stations
  - g. 15" storm sewer, 6" storm sewer, 12" storm sewer
    - i. Duplex sump pumps
  - ii. Foundation drainage system with setting basin and pumps.
  - h. Triplex Compressed / Lab Air System
  - i. Duplex Lab Vacuum System
  - j. WAGD (Waste Anesthesia Gas Disposal) System
  - k. CO<sub>2</sub> System – Manifold
  - l. RO/DI Water System
  - m. Bottle Filling Station for Animal Watering
13. 158 Longwood Avenue – Lack of Drawings
- a. Cold water
  - b. Hot water
  - c. Sanitary
  - d. Storm
14. 160-164 Longwood Avenue
- a. 1-1/2" domestic water service, 1" domestic water service
  - b. Two(2) duplex sets of gas-fired water heaters
  - c. Two (2) 1" Natural Gas services
  - d. 6" sanitary sewer below lab
15. 180 Longwood Avenue



- a. 4" Domestic Water Service
  - i. duplex domestic water booster pump
  - ii. 3" containment reduced backflow preventor
- b. Instantaneous steam-fired domestic water heater
- c. 3" Non-Domestic Water System
  - i. 3" in-plant reduced backflow preventor
- d. Natural Gas system
- e. Tempered water system
- f. Sanitary Sewer
- g. Storm Sewer
- h. Lab Waste Sewer
- i. CO<sub>2</sub> manifold system
- j. Nitrogen manifold system
- k. Lab vacuum system

16. 641 Huntington Avenue

- a. 2" Domestic water service
  - i. Hot, cold and hot water circulation
- b. Electric water heater
- c. 2" Natural Gas service
- d. 6" sanitary sewer
- e. Storm sewer – below slab
- f. Clear water waste system

17. School of Dental Medicine

- a. 4" cold water service





- i. Simplex steam-fired water heater
  - b. Non-domestic water system
    - i. Simplex steam-fired non-domestic heater
  - c. 6" sanitary sewer – below slab
  - d. Storm sewer
  - e. 2" Natural Gas
  - f. pH adjustment system
  - g. Dental air system
  - h. Dental vacuum system
  - i. Surgical vacuum and WAGD system
  - j. WAGD (Waste Anesthesia Gas Disposal) system
18. Research and Education Building (REB)
- a. 6" cold water service
    - i. Triplex domestic water booster pump
    - ii. Duplex 6" backflow preventors
  - b. Steam-fired domestic heaters, simplex, two (2) locations – basement and penthouse
    - i. High and low zone
  - c. 4" non-domestic system  
4" duplex reduced pressure backflow preventors  
Duplex steam-fired water heaters – penthouse
  - d. Tempered water system
  - e. 12" sanitary sewer and 6" sanitary sewer
    - i. Triplex sewage ejectors
  - f. 15" storm sewer and 10" storm sewer
    - i. Duplex sump pumps



- g. 2" Natural Gas service
- h. RO/DI system
- i. RO Reject System
  - i. High pressure air main
- j. Duplex lab air system
- k. Duplex lab vacuum system
- l. pH adjustment system
  - i. 4" lab waste sewer