



## 26 0500 – Existing Building Electrical Systems Description

### 1. Quad Building

#### a. Incoming Electrical Service

- i. The incoming primary electric service for the original Quad buildings consists of medium voltage switchgear (Building “E” Terrace Substation) and has 2 incoming medium voltage circuits (13.8 kV); one from MATEP and the other from Eversource. The switchgear is arranged in a main-tie-main configuration and the tie breaker is normally closed. The switchgear is located under the terrace of the original Tosteson Medical Education Center, Formerly Building E.
- ii. Two (2) feeders emanate from each side of the tie breaker in the switchgear; feeders 1 and 2 serve the Harvard Medical School and Harvard Dental School Buildings identified below; feeders 3 and 4 serve the Harvard School of Public Health.

#### b. The following HMS buildings are served by this switchgear:

- i. Armenise Building
- ii. Building C
- iii. Countway Library
- iv. Goldenson Building
- v. Gordon Hall
- vi. Laboratory for Human Reproduction and Reproductive Biology (LHRRB)
- vii. Research and Education Building (REB)
- viii. Seeley Mudd
- ix. Tosteson Medical Education Center (TMEC)
- x. Vanderbilt
- xi. Warren Alpert

#### c. In addition, Harvard School of Public Health Buildings 1, 2, 3 and FXB are served by this switchgear.

### 2. Armenise Building

#### a. Normal Power

- i. The normal service consists of an unusual double ended arrangement; a single 500 kVA oil filled transformer serves one side of the double ended substation and two (2) 500 kVA oil filled transformers serve the other side. All secondary main breakers are closed, and the tie breaker is closed. All transformers are protected with oil disconnect switches. Dry type transformers and low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard are located in the Basement.



- b. Stand-By/Emergency Power
  - i. A 460 kW, 208/120 Volt, 3 Phase, 4 Wire natural gas fired generator is located on the roof in a sound attenuated enclosure.
- 3. Building C
  - a. Normal Power
    - i. The normal service consists of an unusual double ended arrangement; a single 500 kVA oil filled transformer serves one side of the double ended substation and two (2) 500 kVA oil filled transformers serve the other side. All secondary main breakers are closed, and the tie breaker is closed. All transformers are protected with oil disconnect switches. Dry type transformers and low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard are located in the Basement.
  - b. Stand-By/Emergency Power
    - i. A 200 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located on the roof in a sound attenuated enclosure.
- 4. Countway Library
  - a. Normal Power
    - i. The normal service consists of one double ended 1,500 kVA substations with primary selective load break switches, dry type transformers and low voltage (480/277 Volt, 3 Phase, 4 Wire) drawout switchgear located in the Basement main electrical room.
  - ii. Stand-By/Emergency Power
    - 1. A 400 kW, 480/277Volt, 3 Phase, 4 Wire diesel fired generator is located on grade in a sound attenuated enclosure.
  - iii. Lightning Protection System
    - 1. A UL Master Label lightning protection system is provided on Countway Library.
- 5. Goldenson Building
  - a. Normal Power
    - i. The normal service consists of a double ended arrangement where two (2) 500 kVA transformers, each with an oil disconnect switch serve one side of the substation, and one (1) 750 kVA transformer serves the other side.



Both main breakers are closed, and the tie is open. System is 208/120 Volt, 3 Phase, 4 Wire. Switchboard is located in the Basement.

ii. Stand-By/Emergency Power

1. A 250 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located on grade in a sound attenuated enclosure.

6. Gordon Hall

a. Normal Power

- i. The main normal service for Gordon Hall consists of two 500 kVA transformers each with primary selective load break switches connected in a network arrangement to a common low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard located in the Basement.
- ii. A second service to Gordon Hall is fed from Countway Library via a 480 volt, step down transformer and serves the Data Center.

b. Stand-By/Emergency Power

- i. The Emergency (Life Safety) system is served form C Building generator, and the Data Center is served by the Countway Library generator.

7. Harvard Institutes of Medicine (HIM)

a. Incoming Electrical Service

- i. Incoming electric service consists of medium voltage switchgear with 2 medium voltage circuits (13.8 kV) from Eversource in a primary selective arrangement, located in the Basement.

b. Normal Power

- i. The normal service consists of a double ended 2,500 kVA substation with primary selective load break switches, dry type transformers and low voltage (480/277 Volt, 3 Phase, 4 Wire) drawout switchgear located in the Basement.

c. Stand-By/Emergency Power

- i. A 1,200 kW, 480/277 Volt, 3 Phase, 4 Wire diesel fired generator is located on the roof in a sound attenuated enclosure.



- d. Lightning Protection System
  - i. A UL Master Label lightning protection system is provided on the Harvard Institutes of Medicine building.
  
- 8. Laboratory for Human Reproduction and Reproductive Biology (LHRRB)
  - a. Normal Power
    - i. The normal service consists of two double ended oil filled 1,000 kVA substations, each with primary selective load break switches, dry type transformers and low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard, located in the Basement. Low voltage switchboard was replaced in 2016.
  - b. Stand-By/Emergency Power
    - i. A 400 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located on the roof in an enclosure.
  
- 9. New Research Building (NRB)
  - a. Incoming Electrical Service
    - i. Incoming electric service consists of medium voltage switchgear with 2 medium voltage circuits (13.8 kV) from Eversource in a main-tie-main arrangement, located in the Basement.
  - b. Normal Power
    - i. The normal service consists of two double ended 2,500 kVA substations, each with primary selective load break switches, dry type transformers and low voltage (480/277 Volt, 3 Phase, 4 Wire) drawout switchgear, located in the Basement. Normal power laboratory busways are served from both sides of the double ended substation through a closed transition transfer switch.
  - c. Stand-By/Emergency Power
    - i. Two 1,500 kW, 480/277 Volt, 3 Phase, 4 Wire diesel fired generators are located in the Penthouse Mezzanine and connected to paralleling switchgear.
  - d. Lightning Protection System
    - i. A UL Master Label lightning protection system is provided on the New Research Building.



10. Seeley G. Mudd

a. Normal Power

- i. The normal service consists of two double ended 750 kVA substations, each with primary selective load break switches, dry type transformers and low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard, located in the Basement.

b. Stand-By/Emergency Power

- i. A 750 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located on the roof in an enclosure.

11. Tosteson Medical Education Center (TMEC)

a. Normal Power

- i. The normal service to the original E Building consists of an unusual double ended arrangement; a single 500 kVA oil filled transformer serves one side of the double ended substation and two (2) 500 kVA oil filled transformers serve the other side. All secondary main breakers are closed, and the tie breaker is closed. All transformers are protected with oil disconnect switches. Dry type transformers and low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard are located in the Basement.
- ii. The normal power service to the TMEC Addition consists of a single ended 1,000 kVA substation with primary selective load break switches, dry type transformer and low voltage (480/277 Volt, 3 Phase, 4 Wire) switchboard located in the Basement.

b. Stand-By/Emergency Power

- i. One 200 kW, 480/277 Volt, 3 Phase, 4 Wire diesel fired generator is located in the Penthouse

12. Vanderbilt Hall

a. Normal Power

- i. The normal power service consists of a single ended 750 kVA substation with primary selective load break switches, dry type transformer and low voltage (208/120 Volt, 3 Phase, 4 Wire) switchboard located in the Basement.



b. Stand-By/Emergency Power

- i. One 450 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located on an elevated platform, at grade, between Vanderbilt Hall and the Children's Hospital Parking Garage.
- ii. Vanderbilt Hall is a designated area of rescue/shelter. Additional equipment shall be provided with emergency power as required to meet the needs of the shelter.

13. Warren Alpert Building

a. Normal Power

- i. The normal service consists of a double ended 2,000 kVA substation with primary selective load break switches, oil filled transformers and low voltage (480/277 Volt, 3 Phase, 4 Wire) drawout switchgear located in the Basement.
- ii. In addition, a single ended 3,000 kVA substation, with primary selective load break switches, dry type transformer and low voltage switchboard (480/277 Volt, 3 Phase, 4 Wire) is located on the roof. This substation is served from a separate Eversource line (106-H4) and provides power to the air cooled peak shaving chillers. The Eversource line also serves 180 Longwood pad mounted transformer.

b. Stand-By/Emergency Power

- i. One 1,000 kW, 480/277 Volt, 3 Phase, 4 Wire diesel fired generator is located in the Penthouse

14. 158 Longwood Avenue

a. Normal Power

- i. The normal service is fed from a utility company transformer in transformer vault (HW to confirm).

b. Emergency Power

- i. Emergency lighting is powered with individual emergency powered fixtures.

15. 160-164 Longwood Avenue

a. Normal Power

- i. Service to the building is 240/120 Volt, single phase, from a 100 kVA transformer



b. Stand-By/Emergency Power

- i. Emergency lighting is powered with individual emergency powered fixtures.

16. 180 Longwood Avenue

a. Normal Power

- i. A 500 kVA pad mounted transformer serves a 208/120 Volt switchboard in the basement. This transformer is served from a separate Eversource line (106-H4) which also serves the peak shaving chiller substation on the Warren Alpert roof.

b. Stand-By/Emergency Power

- i. A 150 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located in the basement. Generator was replaced in 2016.

17. 641 Huntington Avenue

a. Normal Power

- i. Service to the building is an 800 amp, 240 Volt delta system with one phase grounded. A 75 kVA step-down transformer provided 208/120 Volt power.

b. Stand-By/Emergency Power

- i. Emergency lighting is powered with individual emergency powered fixtures.

18. School of Dental Medicine

a. Normal Power

- i. The normal service consists of a 500 kVA dry type distribution transformer fed by the Research and Education Building (REB).

b. Stand-By/Emergency Power

- i. A 75 kW, 208/120 Volt, 3 Phase, 4 Wire diesel fired generator is located in the basement.

19. Research and Education Building (REB)

a. Normal Power

- i. The normal service consists of a double ended 1,500 kVA substation with primary selective load break switches, dry type transformers and low voltage (480/277 Volt, 3 Phase, 4 Wire) drawout switchgear located in the Basement.



- b. Stand-By/Emergency Power
  - i. One 650 kW, 480/277 Volt, 3 Phase, 4 Wire diesel fired generator is located in the Penthouse
- c. Lightning Protection System
  - i. A UL Master Label lightning protection system is provided on the Research and Education Building.