25 0510 Existing Building Automation System (BAS) Description

1. Armenise Building
    a. BAS Vendor
        i. Siemens
    b. Communication
        i. P2, Ethernet, BACnet.
    c. Systems
        i. Cooling
            1. D1 Chilled Water: Serves AHU's. Electronic valve actuation. (2) pumps on VFD's. DP control.
            2. D2 Chilled Water: Serves FCU's. Pneumatic valve actuation and bypass. (2) pumps on VFD's.
            3. Condenser Water Control: (2) pumps on starters (?). Bypass valve, emergency city water supply controlled by pneumatic actuation by pressure.
        ii. Heating
            1. HTX-1 (2) steam HEX. On/Off via outside air temperature. Pneumatic valve actuation. (4) pumps on starters. DP control.
            2. HTX-2 (2) steam HEX. On/Off via outside air temperature. Pneumatic valve actuation. (4) pumps on starters. DP control.
            3. Heat Recovery: Pump on starter. Mixing valve pneumatic actuation.
            4. Snow Melt: roof snow melt system.
        iii. AHU's
            1. AHU-1. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Hot water reheat coil. Humidification (LPS). Fan on VFD.

2. AHU-2. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Hot water reheat coil. Humidification (LPS). Fan on VFD.

3. AHU-3. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Hot water reheat coil. Humidification (LPS). Fan on VFD.

4. AHU-4. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Hot water reheat coil. Humidification (LPS). Fan on VFD.

5. AHU-5. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Hot water reheat coil. Humidification (LPS). Fan on VFD.

6. AHU-2. Capacity XX CFM: Mixed air unit. Supply/Return fans. All electronic actuation. Preheat (LPS). Chilled water coil. Humidification (LPS). Fans on VFD's.

7. AC-6. Capacity XX CFM: Mixed air unit. Supply and return fans on starter. Pneumatic actuation. Chilled water coil. Hot water reheat coil.

8. AHU-1. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (HW) Glycol (?). Chilled water coil. Reheat (LPS). Humidification (LPS). Fan on VFD.

9. AHU-10. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Reheat (LPS). Fan on VFD.

10. AC-3. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (HW) Glycol (?). Chilled water coil. Reheat (LPS). Humidification (LPS). Fan on VFD.

11. MAU-1. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (HW) Glycol (?). No cooling. Reheat (LPS). Fan on VFD.

12. AC-9. Capacity XX CFM: Mixed air unit. Supply and return fans on VFD's. Electronic actuation. Preheat (HW) coil. Chilled water coil.

iv. Exhaust Fans

1. 5th floor DI side General: Fan on VFD. Control not shown.

2. 1st floor DI side General: Fan on VFD. Control not shown.

2. Building C

a. BAS Vendor

    i. Siemens

b. Communication

    i. P2, Ethernet, BACnet

c. Systems

    i. Cooling:

        1. HOG ELEC CW: Pneumatic actuation. (4) pumps on VFD', staged operation, DP control.

    ii. Heating:

        1. HTX-1 steam HEX. On/Off via outside air temperature. Pneumatic valve actuation. Pumps on VFD. DP control.

        2. Heat Recovery: Pneumatic control. Pump on starter.

    iii. AHU's:

        1. AHU-1 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil. Humidification (LPS). Fans on VFD.

        2. MAHU-1 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. No cooling. Humidification (LPS). Fans on VFD.

        3. AC-1 Supply. Capacity XX CFM: 100% outside air unit. All pneumatic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil. Fan on VFD.

        4. AC-5. Capacity XX CFM: Room return only unit. Electronic actuation. Chilled water coil. Room temperature control.

        5. AC-6. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) with face and bypass damper. Chilled water coil. Reheat (LPS) coil. Fan on VFD. Room temperature averaged control.

        6. MA-1. Capacity XX CFM: 100% outside air unit. Pneumatic actuation. Preheat and Reheat (HW). Reheat pneumatically controlled. Fan on VFD.

7. MA-7. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) coil. Chilled water coil. Reheat (LPS) coil. Fans on VFD.

iv. Exhaust Fans:

1. EF-6: Static control. Fan on VFD.

2. EF-7 (Hood Exhaust): Fan on VFD. Static pressure control.

3. Countway Library

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet

c. Systems

i. Cooling:

1. Chilled water system: Pneumatic control and actuation. Deny valve. (2) Pumps on VFD.

ii. Heating:

1. HX-1: Steam HEX outside air temperature control. Pneumatic actuation. (2) Pumps on starters.

iii. AHU's:

1. AHU-1. Capacity XX CFM: Mixed air unit. Supply/return fan on VFD. Pneumatic control and actuation. No heating. Chilled water coil. Humidification.

2. AHU-2. Capacity XX CFM: Mixed air unit. Supply/return fan on VFD. Pneumatic control and actuation. No heating. Chilled water coil. Humidification.

3. AHU-3. Capacity XX CFM: Mixed air unit. Fan on starter. Pneumatic control and actuation. Preheat (HW) coil. Chilled water coil. Reheat (HW) Coil. Humidification.

4. AHU-4. Capacity XX CFM: Mixed air unit. Fan on starter. Pneumatic control and actuation. Chilled water coil. Reheat (HW) Coil. Humidification.

5. AHU-5. Capacity XX CFM: Mixed air unit. Fan on starter. Pneumatic control and actuation. Chilled water coil. Reheat (HW) Coil. Humidification.

iv. Exhaust Fans: No information.

4. Goldenson Building

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet, BACnet

c. Systems

i. Cooling:

1. Building Chilled Water: Electronic actuation. Deny valve. (2) Pumps on VFD. Staged operation, fault detection, DP control.

ii. Heating:

1. HTX-1 steam HEX. On/Off via outside air temperature. Pneumatic valve actuation. Pumps on starter.

iii. AHU's:

1. AHU-1 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil.

2. AHU-2 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil.

3. AHU-3 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil.

4. AHU-4 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil.

5. AHU-5 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil.

6. AHU-6 Supply. Capacity XX CFM: 100% outside air unit. All electronic actuation. Preheat (LPS) enabled by outside air temperature. Chilled water coil. Reheat (LPS) coil.

7. AHU-7: Demolished

8. AHU-8 Supply. Capacity XX CFM: Mixed air unit. DX cooling. Electric heat. Humidification (LPS) electronic.

9. MAU-01. Capacity XX CFM: 100% outside air unit. Reheat (LPS). Electronic actuation.

10. MAU-02. Capacity XX CFM: 100% outside air unit. Reheat (LPS). Electronic actuation.

11. MAU-03. Capacity XX CFM: 100% outside air unit. Preheat (LPS). Reheat (LPS). Electronic actuation.

12. MAU-04. Capacity XX CFM: 100% outside air unit. Preheat (LPS). Reheat (LPS). Electronic actuation.

13. AHU-01A. Capacity XX CFM: Mixed air unit. Electronic actuation. Chilled water coil. Reheat (LPS). Humidification.

14. AHU-09. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (HW) coil. Chilled water coil. Reheat (LPS). Humidification.

iv. Exhaust Fans:

1. EXF-1: NMR Lab 145 EXF. Operated with panic button.

2. EXF-2 & 3: General Lab Exhaust. Static pressure control.

5. Gordon Hall

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet

c. Systems

i. Cooling

1. Building Chilled Water: Chilled water deny valve control. Electronic valve actuation. Pumps on VFD's. DP control.

ii. Heating

1. HTX-1 steam HEX. On/Off via outside air temperature. Electronic valve actuation. Pumps on VFD's. DP control.

iii. AHU's

1. SPF: Stairwell pressurization fan
2. AHU-2. Capacity XX CFM: Mixed air unit. Supply/Return fans. Chilled water coil. No heat.
3. AHU-3. Capacity XX CFM: Mixed air unit. Supply fan. Chilled water coil. No heat.
4. AHU-5. Capacity XX CFM: 100% Outside air unit. (2) low pressure steam preheat valves. Chilled water coil.
5. MUA-9. Capacity XX CFM: 100% Outside air unit. Hot water preheat and reheat coils. Chilled water coil.
6. AHU-10. Capacity XX CFM: Mixed air unit. Supply/Return fans. Chilled water coil. Hot water coil.
7. AHU-1. Capacity XX CFM 1: Mixed air unit. Supply fan. Chilled water coil. No heat.
8. AHU-12. Capacity XX CFM: Mixed air unit. Supply fan. Chilled water coil. No heat.

iv. Exhaust Fans

1. Atrium Exhaust

6. Harvard Institutes of Medicine (HIM)

a. BAS Vendor

   i. Johnson Controls.

   ii. Siemens on 4th Floor and Environmental rooms

b. Communication

   i. P2, Ethernet, BACnet

c. Systems

   i. Cooling

      1. Process CHW System: Chilled water deny valve control. Electronic valve actuation. (2) Pumps on starters. Staged control by DP and Lead/Lag. Bypass valve.

      2. AHU CHW System: Chilled water deny valve control. Electronic valve actuation. (2) Pumps on VFD's. Staged control by DP and Lead/Lag. Bypass valve.

      3. FCU CHW System: Chilled water deny valve control. Electronic valve actuation. (2) Pumps on VFD's. Staged control by DP and Lead/Lag. Bypass valve.

   ii. Heating

      1. Lab reheat

         a. 2 pumps on VFD's, DP control, lead/lag program.

      2. Animal reheat

         a. 2 pumps on VFD's, DP control, lead/lag program.

      3. Glycol Heat Recovery

         a. 2 pumps on VFD's, DP control, lead/lag program. Bypass valve electronic actuation.

   iii. AHU's

      1. AHU-1. Capacity XX CFM: 100% outside air unit. Electronic actuation. Heat recovery coil. Preheat (HW). Chilled water coil. Humidification (LPS). Fan on VFD.

2. AHU-2. Capacity XX CFM: 100% outside air unit. Electronic actuation. Heat recovery coil. Preheat (HW). Chilled water coil. Humidification (LPS). Fan on VFD.

3. AHU-3. Capacity XX CFM: 100% outside air unit. Electronic actuation. Heat recovery coil. Preheat (HW). Chilled water coil. Humidification (LPS). Fan on VFD.

4. AHU-4. Capacity XX CFM: 100% outside air unit. Electronic actuation. Heat recovery coil. Preheat (HW). Chilled water coil. Humidification (LPS). Fan on VFD.

5. AHU-5. Capacity XX CFM: 100% outside air unit. Electronic actuation. Heat recovery coil. Preheat (HW). Chilled water coil. Humidification (LPS). Fan on VFD.

6. AHU-6. Capacity XX CFM: 100% outside air unit. Electronic actuation. Heat recovery coil. Preheat (HW). Chilled water coil. Humidification (LPS). Fan on VFD.

7. AHU-7. Capacity XX CFM: 100% Return air unit. Electronic actuation. No heat. Chilled water coil. Fan on starter.

8. AHU-8. Capacity XX CFM: 100% Return air unit. Electronic actuation. No heat. Chilled water coil. Fan on starter.

9. HVU-1. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Reheat (Medium Unknown). No cooling. Fan on starter.

10. HVU-2. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Reheat (Medium Unknown). No cooling. Fan on starter.

11. HVU-3. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Reheat (Medium Unknown). No cooling. Fan on starter.

12. HVU-4. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Reheat (Medium Unknown). No cooling. Fan on starter.

iv. Exhaust Fans

1. EX-1: Fan on starter. Room temperature control with isolation damper proof.

2. EX-2: Fan on starter. Room temperature control with isolation damper proof.

3. EX-3: Fan on starter. Room temperature control with isolation damper proof.
4. EX-4: Fan on starter. Room temperature control with isolation damper proof.
5. EAHU-1: Heat recovery coil. 2 fans on VFD.
6. EAHU-2: Heat recovery coil. 2 fans on VFD.
7. EAHU-3: Heat recovery coil. 2 fans on VFD.
8. EAHU-4: Heat recovery coil. 2 fans on VFD.
9. EAHU-5: Heat recovery coil. 1 fan on VFD.
10. EAHU-6: Heat recovery coil. 1 fan on VFD.
11. EAHU-7: Heat recovery coil. 1 fan on VFD.

7. Laboratory for Human Reproduction and Reproductive Biology (LHRRB)
    a. BAS Vendor
        i. Siemens
    b. Communication
        i. P2, Ethernet.
    c. Systems
        i. Cooling
            1. Chilled water deny valve control. Electronic valve actuation. (2) Pumps on starters. Staged control by DP and Lead/Lag.
        ii. Heating
            1. HX-1: Pneumatic control and actuation. Pump on starter.
        iii. AHU's
            1. AHU-1. Capacity XX CFM: 100% outside air unit. Pneumatic actuation. Chilled water coil. Reheat (LPS). Humidification. Fan on starter.

2. AHU-3. Capacity XX CFM: 100% outside air unit. Pneumatic actuation. Chilled water coil. Reheat (LPS). Humidification. Fan on starter.

3. HV-1. Capacity XX CFM: 100% outside air unit. Pneumatic actuation. No cooling. Reheat (LPS). Humidification. Fan on VFD.

4. AC-4. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Chilled water coil. Reheat (LPS). Fan on multi state starter.

iv. Exhaust Fans

1. No fans indicated.

8. New Research Building (NRB)

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet, BACnet

c. Systems

i. Cooling

1. Process Cooling System: Electronic Actuation. Cooling tower fans on VFD's. Condenser water pumps on starter. Chilled water pumps on VFD's, DP control. Bypass valve.

2. 4600 ton Chiller Plant.

ii. Heating

1. HE-1 / HE-2: Steam HEX. Electronic actuation. (2) Pumps on VFD's. DP control. DP valve.

2. HE-3 / HE-4: Steam HEX. Electronic actuation. (2) Pumps on VFD's. DP control. DP valve.

3. HE-5 / HE-6: Steam HEX. Electronic actuation. (2) Pumps on VFD's. DP control. DP valve.

4. HE-7 / HE-8: Steam HEX. Electronic actuation. (2) Pumps on starters. DP control. DP valve.

5. HE-9 / HE-10: Steam HEX. Electronic actuation. (3) Pumps on VFD's. DP control. DP valve. Isolation valves.

iii. AHU's

1. AHU-1. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
2. AHU-2. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
3. AHU-3. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
4. AHU-4. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
5. AHU-5. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
6. AHU-6. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
7. AHU-7. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
8. AHU-8. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
9. AHU-9. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). Fans (2) on VFD's.
10. AHU-10. Capacity XX CFM: Mixed air unit. Electronic actuation. Chilled water coil. Reheat (LPS). Supply fans (2) on VFD's.
11. AHU-11. Capacity XX CFM: Mixed air unit. Electronic actuation. Chilled water coil. Reheat (LPS). Supply and Return fans on VFD's.
12. AHU-12. Capacity XX CFM: Mixed air unit. Electronic actuation. Chilled water coil. Reheat (LPS). Supply and Return fans on VFD's.
13. AHU-14. Capacity XX CFM: Return air unit. Electronic actuation. Chilled water coil. No heat.
14. AHU-15. Capacity XX CFM: Return air unit. Electronic actuation. Chilled water coil. No heat.

15. HVU-1. Capacity XX CFM: 100% outside air unit. Preheat (LPS). No cooling. Fan on starter.
16. HVU-2. Capacity XX CFM: 100% outside air unit. Preheat (LPS). No cooling. Fan on starter.
17. HVU-3. Capacity XX CFM: 100% outside air unit. Preheat (LPS). No cooling. Fan on starter.
18. HVU-4. Capacity XX CFM: 100% outside air unit. Preheat (LPS). No cooling. Fan on starter.
19. HVU-5. Capacity XX CFM: 100% outside air unit. Preheat (LPS). No cooling. Fan on starter.
20. The following supply fan (SF) are on starters: 2 through 5, 7, 11, 15, 21, 24 through 32.
21. The following supply fans (SF) are on VFD's: 12, 13, 14, 16 through 20, 22, 23.
22. VU-1: 100% outside air unit. Fan on VFD.
23. VU-2: 100% outside air unit. Fan on VFD.

iv. Exhaust Fans

1. The following fans (EF) are on starters: 2, 3, 4, 5, 6, 11, 26.
2. The following fans (EF) are on VFD's: 7, 12, 13, 14, 15, 16, 17, 36, 37.

9. Seeley G. Mudd

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet

c. Systems

i. Cooling

1. Chilled water deny valve control. Electronic valve actuation. (2) Pumps on starters. Staged control by DP and Lead/Lag.

ii. Heating

1. HX-1 FCU: Steam HEX (2) valves. Pneumatic Control and actuation. (2) Pump on starter.

2. HX-2 Building Reheat: Steam HEX (2) valves. Pneumatic Control and actuation. (2) Pump on starter.

3. Glycol Hot Water System: (2) Steam HEX's each with (2) steam supply valves. Electronic actuation. (2) Pumps on VFD's.

iii. AHU's

1. AHU-1. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). (3) Fans on VFD's.

2. AHU-2. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (HW). Chilled water coil. Humidification (LPS). (3) Fans on VFD's.

3. AHU-4. Capacity XX CFM: 100% outside air unit. Preheat (HW) electronic control. Chilled water pneumatic control. Reheat (HW) pneumatic control. Humidification electronic control. Fan on VFD.

4. AHU-5. Capacity XX CFM: 100% outside air unit. Preheat (HW) electronic control. Chilled water pneumatic control. Reheat (HW) pneumatic control. Humidification electronic control. Fan on VFD.

5. MA-6. Capacity XX CFM: Pneumatic control. Preheat (LPS). Chilled water coil. Fan on starter.

6. MA-8. Capacity XX CFM: Pneumatic control. Preheat (LPS). Chilled water coil. Reheat (HW). Humidification (LPS). Fan on starter.

iv. Exhaust Fans

1. Nothing listed.

10. Tosteson Medical Education Center (TMEC)

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet

c. Systems

i. Cooling

1. Building Chilled Water: Return temperature control. Mix valve control unknown. Pump on VFD.

2. Building Chilled Water Fire Pump Room: Electronic actuation. VFD has all failed points.

ii. Heating

1. HX-1: Steam HEX. Pneumatic actuation. Outside air temperature control. Pumps on VFD.

2. HX-1: Steam HEX. Pneumatic actuation. Outside air temperature control. Pumps on VFD.

3. HX-1 Baseboard: Steam HEX. Steam valve electronic actuation. Bypass valve pneumatic actuation. Outside air temperature control. Pumps on starter.

4. HX-2 Reheats: Steam HEX. Steam valve electronic actuation. Bypass valve pneumatic actuation. Outside air temperature control. Pumps on starter.

iii. AHU's

1. AHU-1 Basement. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Humidification. (2) Fans on VFD's.

2. AHU-2 Basement. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Humidification. (2) Fans on VFD's.

3. AHU-3 Basement. Capacity XX CFM: 100% Outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Humidification. (2) Fans on VFD's.

4. AHU-4 Basement. Capacity XX CFM: Mixed air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Supply and return fans on VFD's.

5. SF-1 E MUA-0001. Capacity XX CFM: Fan controlled by vanes. Supplies air to AHU-1, 2, 3 & 4.

6. AHU-1 Penthouse. Capacity XX CFM: Mixed air unit. Pneumatic actuation. Energy recovery. Preheat (LPS) face and bypass. Chilled water coil. Supply and return fans on VFD's.

7. AHU-2 Penthouse. Capacity XX CFM: Mixed air unit. Pneumatic actuation. Preheat (LPS) face and bypass. Chilled water coil. Supply and return fans on VFD's.

8. AHU-3 Penthouse Atrium Fan. Capacity XX CFM: Mixed air unit. Pneumatic actuation. Preheat (LPS) face and bypass. Chilled water coil. Supply and return fans on VFD's.

iv. Exhaust Fans

1. EXF-2: Fan on VFD controlled by static pressure.

2. EXF-5: Fan on VFD controlled by static pressure.

3. EXF-34: Fan on VFD controlled by static pressure.

11. Vanderbilt Hall

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet

c. Systems

i. Cooling

1. Chilled Water System: Pneumatic Control and actuation. (2) Deny valves. (2) Pumps on VFD's. (2) Pumps on starters.

2. IT Department Chilled Water System: Pneumatic control and actuation. DP sensors. (2) Pumps on staged VFD's.

ii. Heating

1. HX-1: Pneumatic actuation. Steam supply (LPS).

2. HX-2: Pneumatic actuation. Steam supply (LPS).

3. HX-3: Pneumatic actuation. Steam supply (LPS).

4. HX-4: Pneumatic actuation. Steam supply (LPS). (2) staged pumps on starters.

iii. AHU's

1. AHU-1. Capacity XX CFM: Mixed air unit. Preheat (HW) electronic control. Chilled water pneumatic control. Supply and return fans on starters.

2. AHU-2. Capacity XX CFM: Mixed air unit. Preheat (HW) pneumatic control. Chilled water pneumatic control. Supply and return fans on starters.

3. AHU-3. Capacity XX CFM: Mixed air unit. Preheat (HW) pneumatic control. Chilled water pneumatic control. Supply and return fans vanes on pneumatic control.

4. AHU-5. Capacity XX CFM: 100% outside air unit. Bypass damper electronic control. DX cooling 2 stages. Reheat (LPS). Fan on VFD.

5. HV-1. Capacity XX CFM: 100% outside air unit. Reheat (LPS) pneumatic control. No cooling. Fan on starter.

6. HV-2. Capacity XX CFM: 100% outside air unit. Reheat (LPS) pneumatic control. No cooling. Fan on starter.

7. HV-4. Capacity XX CFM: 100% outside air unit. Reheat (LPS) pneumatic control. No cooling. Fan on starter.

8. HV-5. Capacity XX CFM: 100% outside air unit. Reheat (LPS) pneumatic control. No cooling. Fan on starter.

iv. Exhaust Fans

1. None listed.

12. Warren Alpert Building

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet, BACnet.

c. Systems

i. Cooling

1. Chilled Water Basement / MATEP: (2) Pumps on VFD staged operation. Fault detection. DP control.

2. Chilled Water Independent McQuay: Roof McQuay Chillers. (3) pumps on VFD. (3) Mech chillers.

3. Cooling Towers: Pneumatic bypass. (2) Pumps on starters. Tower fans on VFD. Backup Plate & Frame HEX.

ii. Heating

1. HX-1 Radiation: (2) Steam supply valves pneumatic control. (2) Pumps on starters. Bypass valve electronic actuation.

2. HX-2 Animal: (2) Steam supply valves pneumatic control. (2) Pumps on starters. Bypass valve pneumatic actuation.

3. HX-3 Lab Reheat: (2) Steam supply valves pneumatic control. (2) Pumps on starters. Bypass valve pneumatic actuation.

4. Heat Recovery System: (2) Pumps on starters. Mixing valve pneumatic control.

iii. AHU's

1. AHU-1. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Fan wall on VFD's (4).

2. AHU-2. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Fan wall on VFD's (4).

3. AHU-3. Capacity XX CFM: 100% outside air unit. Preheat (LPS) electronic actuation. Chilled water pneumatic. (2) Humidifier valves pneumatic control. (2) Fans on VFD's.

4. AHU-4. Capacity XX CFM: 100% outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Fan wall on VFD's (4).

5. AHU-5. Capacity XX CFM: 100% outside air unit. Pneumatic control. Preheat (LPS). Chilled water coil. (2) Humidifier valves. Fan control by vanes.

6. AHU-6. Capacity XX CFM: 100% outside air unit. Pneumatic control. Preheat (LPS). Chilled water coil. (2) Humidifier valves. Fan control by vanes.

7. AHU-7. Capacity XX CFM: Mixed air unit. Pneumatic control. Preheat (LPS). Chilled water coil. Reheat (LPS). Supply and return fans on VFD's.

8. HV-1. Capacity XX CFM: 100% Outside air unit. Pneumatic control. Preheat (LPS). No cooling. Fan on starter.

iv. Exhaust Fans

1. EAHU-1. Capacity XX CFM: Fan wall with 12 fans on VFD. Heat recovery coil.

2. EAHU-2. Capacity XX CFM: Fan wall with 12 fans on VFD. Heat recovery coil.

3. EAHU-3. Capacity XX CFM: Fan wall with 12 fans on VFD. Heat recovery coil.

4. EAHU-4. Capacity XX CFM: Fan wall with 12 fans on VFD. Heat recovery coil.

5. EAHU-5. Capacity XX CFM: Fan control with pneumatic vanes. Heat recovery coil.

6. EAHU-6. Capacity XX CFM: Fan wall with 12 fans on VFD. Heat recovery coil.

7. Garage Exhaust: Fan on starter.

8. Cage Wash: (2) fans on starter.

13. 158 Longwood Avenue

a. No BAS in building.

14. 160-164 Longwood Avenue

a. No BAS in building.

15. 180 Longwood Avenue

a. BAS Vendor

i. Siemens.

b. Communication

i. P2, Ethernet.

c. Systems

i. Cooling

1. AHU Chilled Water: Pneumatic actuation. Pumps on VFD's with staged control.

2. FCU Chilled Water: Pneumatic actuation. DP. Pumps on VFD's.

ii. Heating

1. HX-1: Steam HEX. Pneumatic actuation. Outside air temperature controlled. Pumps on VFD's.

2. HX- 2/3 ARC: High pressure steam HEX. Pneumatic actuation. Line TE controlled with reset by outside air temperature. Pumps staged on starters. DP sensor and bypass valve regulate pressure.

iii. AHU's

1. AHU-1. Capacity XX CFM: 100% Outside air unit, McQuay packaged unit. Preheat (LPS) control not on graphic. Mechanical cooling 2 staged compressors.

2. AHU-2. Capacity XX CFM: 100% Outside air unit. Pneumatic actuation. Preheat (LPS) face and bypass. Chilled water coil. Fan on starter (?).

3. AHU-4. Capacity XX CFM: Mixed air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Humidifier is shut down and said not to be used.

iv. Exhaust Fans

1. EF-1: Fan on starter.

2. EF-2: Fan on starter.

3. EF-3: Fan on starter.

16. 641 Huntington Avenue

a. BAS Vendor

i. Siemens

b. Communication

ii. P2, Ethernet.

c. Systems

iii. Cooling

1. Electronic actuation. Outside air temperature enabled. DP control with bypass valve. (2) Pumps on VFD's.

iv. Heating

1. Steam Boiler System: Electronic actuation. 2 city water feed valves. 2 condensate pumps on starters.

2. Hot Water System: DP sensor. (2) Pumps on VFD's.

v. AHU's

1. ERU1. Capacity XX CFM: Electronic actuation. Heat wheel motor VFD. Bypass damper. Chilled water coil. Reheat (HW). Supply and Return fans on VFD's.

2. Fresh Air Damper 201: Outside air / program enabled for FCU 201.

3. Fresh Air Damper 301: Outside air / program enabled for FCU 301.

4. Fresh Air Damper 312: Outside air / program enabled for FCU 312.

5. Fresh Air Damper 401: Outside air / program enabled for FCU 401.

vi. Exhaust Fans

1. EF-2: Fan on starter.

2. EF-3: Fan on starter.

17. School of Dental Medicine

a. BAS Vendor

i. Siemens

b. Communication

i. P2, Ethernet

c. Systems

i. Cooling

1. Chilled Water System: (2) DP sensors. (2) Pumps on VFD's.

2. Main Building Chilled Water System: DP sensor. Deny valve. Pneumatic control.

ii. Heating

1. HX-1: Steam HEX. Pneumatic control. Bypass valve. (2) Staged pumps on starters.

2. 2nd Floor Radiation: Electronic mixing valve. (2) staged pumps on starters.

3. HX-3: Steam HEX. Pneumatic control and actuation. Steam supply valves two position. Isolation valves. (2) pumps on starters.

iii. AHU's

1. AHU-1. Capacity XX CFM: Mixed air unit. Pneumatic control. Preheat (LPS). Chilled water coil. Supply and return fans on VFD's.

2. AHU-2. Capacity XX CFM: Mixed air unit. Pneumatic control. No heat. Chilled water coil. Supply and return fans on VFD's.

3. Malony AHU. Capacity XX CFM: Mixed air unit. Preheat (HW) electronic. Chilled water control not shown. Unit temperature controlled. Fan on starter.

iv. Exhaust Fans

1. None listed.

18. Research and Education Building (REB)

a. BAS Vendor

i. Siemens

b. Communication

ii. P2, Ethernet, BACnet.

c. Systems

iii. Cooling

1. Chilled Water Pumps Basement: DP Sensor. Ultrasonic Energy Meter. (2) Pumps on VFD's.

iv. Heating

1. HX-1/2: Steam HEX. Electronic actuation. Outside air temperature control. (2) Pumps on VFD's.

2. Glycol Heat Recovery EAU1 Coil: Steam HEX. Electronic actuation. Outside air temperature enabled. Bypass valve. Pumps on starter.

v. AHU's

1. AHU-1: Basement 100% outside air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Humidification. Fans on VFD.

2. AHU-2: Mixed air unit. Electronic actuation. Preheat (LPS). Chilled water coil. Humidification. Supply and return fans on VFD.

3. HVU-1: Heat unknown. Humidification electronic. Supply fan on VFD.

4. Stair 1 / 2PO1C Pressure Fans: HVU-1 on starter (?). EX-07 on starter. SF-3 on starter. SF-2 on starter.

vi. Exhaust Fans

1. EAHU-1. Capacity XX CFM: Electronic actuation. Heat recovery coil. Outside air relief damper. (2) Fans on starters.

2. EF 3 / 4: Penthouse / Emergency Electric Room ventilation. Temperature control. Fan on starter.

3. EF 5 / 6 / 7: Toilet, Stairwell pressure, Smoke vestibules. Fans on starters.

4. EF 8 / 9: 8 basement electric room ventilation on drive temperature control. Penthouse Necropsy table fan on starter.

5. EF 10 / 11 / 12: 10 – Radio Isotope hood on drive. 11 – Histology fume hood on starter. 12 – Penthouse MER on starter.