

Scope of Work

This project involves the removal of steam equipment to heat a college building and the addition of boilers to heat the building. New controls, pumps and ancillary equipment will be installed. Air purifiers are to be installed on two air handlers.

Alternate 1:  
Replace JACE Controller  
Replace one shot chemical feeder

General Requirements & Notes:

1. All work shall comply with the North Carolina Building Code
2. All mechanical work shall be done by trained and qualified technicians
3. All electrical work shall be done by trained and qualified electricians
4. Install mechanical equipment in accordance with manufacturers recommendations
5. Drawings and documents are diagrammatic and are intended to convey scope and general arrangements unless otherwise indicated
6. Contractor is responsible for surveying site conditions and determining the best route for equipment, wiring, ducting, piping and conduits
7. Contractor will notify engineer immediately if an issue arises that cannot be immediately resolved
8. Install equipment to allow manufacturers recommended clearances
9. Provide a 48 hour notice before any power or gas shutdown
10. Seal Penetrations through floors or fire walls to maintain the integrity of the fire and acoustic ratings of the walls and floors.
11. All trades shall coordinate their work with the other disciplines to maintain schedule integrity.
12. Submittals drawings and paperwork will be approved by engineer before equipment and materials will be ordered
13. Not all abbreviations may apply to this project.

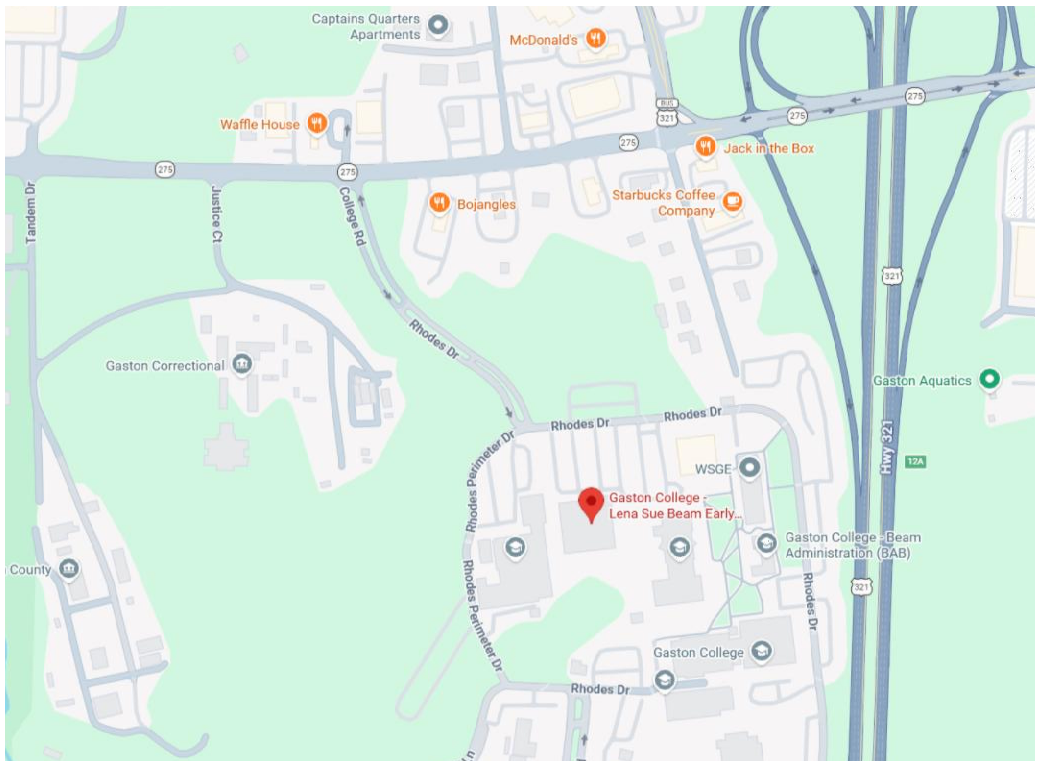
Design Complies with the 2018 North Carolina Building Code

Gaston College



Dallas, North Carolina  
Lena Sue Beam Boiler Addition

Site Address: 201 Highway 321 South. Dallas NC 28034



Location Map

Schedule of Drawings

- A0.1 Cover Sheet
- A0.2 Appendix B
- M0.1 Mechanical Schedules
- M1.0 Mechanical Demo Plan
- M1.1 Mechanical Plan
- M1.2 Mechanical Plan
- M1.3 Mechanical Plan
- M2.1 Mechanical Details
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- E0.1 Electrical Schedules
- E1.1 Electrical Plan
- E1.2 Electrical Plan
- E1.3 Electrical Plan
- E3.1 Electrical Details
- E3.2 Electrical Details

Abbreviations and References

- NFPA - National Fire Protection Agency
- SMANCA - Sheet Metal & Air Conditioning Contractor's National Association
- NCFG - North Carolina Fuel Gas Code
- NCMC - North Carolina Mechanical Code
- NEC - National Electric Code
- NEMA - National Electrical Manufacturers Association
- ANSI - American National Standards Institute
- UL - Underwriters Laboratory

- AFF - Above Finished Floor
- AFG - Above Finished Grade
- AFUE - Annual Fuel Utilization Efficiency
- APPROX - Approximate
- ALUM - Aluminum
- BFF - Below Finished Floor
- BFG - Below Finished Grade
- BHP - Brake Horse Power
- CAP. - Capacity
- CFM - Cubic Feet per Minute
- CONN. - Connection
- COORD. - Coordinate
- CU. FT. - Cubic Foot
- DB - Dry Bulb
- DISTR. - Distribution
- DWG. - Drawing
- DX - Direct Expansion
- ETR - Existing to remain
- ESP - External Static Pressure
- EQUIV. - Equivalent
- EXH. - Exhaust
- FPM - Feet per Minute
- GALV. - Galvanized
- Hp - Horse Power
- KW - Kilowatt
- MCA - Minimum Circuit Ampacity
- MIN. - Minimum
- NC - Normally Closed
- NO - Normally Open
- NPSH - Net Positive Suction Head
- O.A. - Outside Air
- Occup. - Occupancy
- PSI - Pounds per Square Inch
- QTY. Quantity
- RECT. - Rectangular
- RPM - Revolutions per Minute
- SCH. - Schedule
- SEER - Seasonal Energy Efficiency Rating
- SENS. - Sensible
- SPEC. - Specification
- Sq ft. - Square Feet
- TYP. - Typical Installation / Materials
- UON - Unless Otherwise Noted
- VAV - Variable Air Volume
- VRV - Variable Refrigerant Volume
- WB - Wet Bulb

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Project No:  
01-2026005  
Scale: N/A  
Date: 03-24-2026  
Title: Cover Sheet

G0.1



| Boiler Schedule |               |              |              |         |                     |                      |               |           |                              |           |                          |                            |             |                        |                       |               |               |                 |                        |        |             |          |
|-----------------|---------------|--------------|--------------|---------|---------------------|----------------------|---------------|-----------|------------------------------|-----------|--------------------------|----------------------------|-------------|------------------------|-----------------------|---------------|---------------|-----------------|------------------------|--------|-------------|----------|
| Plan ID         | Service       | Manufacturer | Series       | Model # | Max Gas Input (MBH) | Heating Output (MBH) | Total Eff., % | Fuel Type | Min. Gas Pressure, (in w.c.) | Turn Down | Gas Line Size & Schedule | Water Pipe Size & Schedule | EWT/ LWT    | Design Flow rate (gpm) | Pressure Drop, ft H2O | Flue Size, in | Flue Material | Unit Dimensions | Voltage / Phase / Amps | Weight | Accessories | Comments |
| B -1            | Building (HW) | Laars        | NeoTherm XTR | 999     | 999                 | 962                  | 96.3%         | Nat. Gas  | 3.5                          | 10:1      | 1 $\frac{1}{2}$ " NPT    | 2 1/2", sch 40             | 160" x 180" | 96                     | 15                    | 6"Ø           | AL29-4C       | 58" x 27" x 53" | 120V/ 1Ø/ 5.3 A        | 542    | 1, 2, 3     | 1, 2     |
| B -2            | Building (HW) | Laars        | NeoTherm XTR | 999     | 999                 | 962                  | 96.3%         | Nat. Gas  | 3.5                          | 10:1      | 1 $\frac{1}{2}$ " NPT    | 2 1/2", sch 40             | 160" x 180" | 96                     | 15                    | 6"Ø           | AL29-4C       | 58" x 27" x 53" | 120V/ 1Ø/ 5.3 A        | 542    | 1, 2, 3     | 1, 2     |

Accessories:

- Install on 6" concrete pad
- 75 PSIG pressure relief valve
- Variable Prime boiler pump control

Comments:

- Install on new concrete pad
- ASME (CSD-1) Compliant
- Equivalent manufacturers are Laars, Lochinvar and Raypack

Pump Schedule

| Plan ID | Service        | Manufacturer   | Model #     | Water Flow (GPM) | Head (ft H2O) | Eff., % | Motor Hp | Motor Rpm | Voltage/ Phase | Water Pipe Size & Schedule                      | Triple Duty Valve | Accessories | Comments |
|---------|----------------|----------------|-------------|------------------|---------------|---------|----------|-----------|----------------|-------------------------------------------------|-------------------|-------------|----------|
| HWP-1   | Hot Water - L1 | Bell & Gossett | Series 1510 | 32               | 60            | 44      | 2        | 1750      | 460/ 3         | 1 $\frac{1}{2}$ "D, 2" S, sch 40                | N                 | 1           | 1        |
| HWP-2   | Hot Water - L1 | Bell & Gossett | Series 1510 | 32               | 60            | 44      | 2        | 1750      | 460/ 3         | 1 $\frac{1}{2}$ "D, 2" S, sch 40                | N                 | 1           | 1        |
| BP-1    | Boiler Primary | Grundfos       | 25709 VL    | 96               | 23            | 66      | 1        | 1760      | 115/ 1         | 2 $\frac{1}{2}$ "D, 2 $\frac{1}{2}$ " S, sch 40 | N                 | 1, 2        | 2, 3, 4  |
| BP-2    | Boiler Primary | Grundfos       | 25709 VL    | 96               | 23            | 66      | 1        | 1760      | 115/ 1         | 2 $\frac{1}{2}$ "D, 2 $\frac{1}{2}$ " S, sch 40 | N                 | 1, 2        | 2, 3, 4  |

Accessories:

- Differential Pressure Gauges
- Variable frequency drive capable

Comments:

- Existing Pump
- Install inline with service pipe
- Comparable manufacturers are Grundfos, Taco and Bell and Gossett
- H2O

Air-Dirt Separator Schedule

| Plan ID | Service   | Manufacturer | Model #  | Water Flow (GPM) | Head Loss (ft H2O) | Volume (Gallons) | Weight (lbs) | Water Pipe Size & Schedule | Accessories | Comments |
|---------|-----------|--------------|----------|------------------|--------------------|------------------|--------------|----------------------------|-------------|----------|
| AS      | Hot Water | Spirotherm   | VHT250FA | 96               | 1.8                | 3.5              | 238          | 2 1/2", Flanged            | 1, 2, 3     | 1, 2, 3  |

Accessories:

- Air and Dirt Separator
- Ball valve on drain line
- Automatic air vent

Comments:

- Follow manufacturers instructions
- Support unit using ANSI/MSS SP-69
- Comparable manufacturers are Xylem, Taco and Amtrol

Ion Generating Air Purifiers

| Plan ID | Model           | Application | Flow Capacity (CFM) | Pressure Drop (WC) | Temp Range (F) | Humidity Range | Voltage | Power    | Size            | Weight |
|---------|-----------------|-------------|---------------------|--------------------|----------------|----------------|---------|----------|-----------------|--------|
| IP -1   | AtmosAir; 508FC | Supply Duct | 0 - 15,000          | ~0.01              | -20 -140       | 0 - 99%        | 120 V   | 28 Watts | 11" x 28" x 9.5 | 23 lbs |

Comments:

- Follow manufacturers instructions
- Device to be third party listed
- Comparable Manufacturers are Phenomenal Aire; GPS -DM48-AC & iWAVE-C
- Differential Pressure Switch for on/off control

Alternate 1:

Chemical Feeder Schedule

| Plan ID | Manufacturer | Model #        | Description                             | Gallons | Max. Pressure | Max Temp. | Accessories | Comments |
|---------|--------------|----------------|-----------------------------------------|---------|---------------|-----------|-------------|----------|
| CF-1    | Cannonwater  | Vector FA-1000 | Bypass Feeder and buttress threaded cap | 5       | 300 PSI       | 200 °F    | 1           | 1        |

Accessories:

- Adjustable legs

Comments:

- Comparable manufacturers are Chemworld, Cannonwater, Neptune and Axiom

Alternate 1:

Direct Digital Controller Schedule

| Plan ID | Manufacturer | Model # | Description               | I/O Points | Voltage | Memory | Accessories | Comments |
|---------|--------------|---------|---------------------------|------------|---------|--------|-------------|----------|
| DDC1    | LYNXSPRING   | PC-9000 | JENEsys PC9000 Controller | 60         | 115     | 1 GB   | 1, 2        | 1, 2, 3  |

Accessories:

- Niagara 4 license, version 4.15 or newer
- Minimum I/O 60 points

Comments:

- Open Ended JACE controller
- Listed by BAC/net Testing Lab
- Tridium Compatible
- Comparable manufacturers are ABB, Honeywell and Vykon

GAS PIPING NOTES

- Minimum gas piping size shall be  $\frac{1}{2}$ "
- Gas piping shall be installed to the requirements of the North Carolina fuel gas code and NFPA Standard No. 54. All inside piping to be supported by devis hangers with galvanized rod with a maximum of 8' on center.
- Gas piping shall be tested in accordance with the procedures noted in NFPA Standard No. 54. All tests required by the local gas inspection department or gas company shall also be provided.
- Paint all gas piping with two coats of yellow enamel and stencil "Gas" on pipe at 5' -0" centers.
- Gas valves shall be a min. 125 psi rated, non-lubricated plug type with bronze body and bronze plug.
- Provide unions, flanges, coupling and fittings at connection to all valves and equipment. Do not use direct welded or threaded connection to valves or equipment.
- Provide non-conducting dielectric unions whenever connecting dissimilar metals.
- Gas piping routed on the roof shall have pipe supported provided in accordance with the 2018 NC Fuel Gas Code chapter 4

Gas Load Requirements:

| Item                    | Description           | Qty | Input MBH | Total MBH |
|-------------------------|-----------------------|-----|-----------|-----------|
| B-1                     | New Condensing Boiler | 1   | 1000      | 1000      |
| B-2                     | New Condensing Boiler | 1   | 1000      | 1000      |
|                         |                       |     |           |           |
|                         |                       |     |           |           |
|                         |                       |     |           |           |
|                         |                       |     |           |           |
|                         |                       |     |           |           |
|                         |                       |     |           |           |
|                         |                       |     |           |           |
| TOTAL BUILDING LOAD MBH |                       | =   | 2000      |           |

GAS PIPE SIZING CALCULATIONS

- NCFGC Table 402.4(5) - 2.0 PSIG W/1.0 PSIG pressure drop
- Total Gas Input (new equipment): 2000
- High Pressure: P1=2.0 PSIG P2=1.0 PSIG
- Length: 35'-0" LNFT
- Fittings Factor: 1.25 (25%)
- Total Equivalent Length of 43 ft
- Natural Gas Steel: 1" Schedule 40 Metallic Pipe

General Installation Requirements

- Drawings are diagrammatic and are intended to convey scope and general arrangements unless otherwise indicated. They do not show every rise, fitting, offset and detail. It is the contractor's responsibility to read and understand the scope and intent of the drawings and specifications and deliver a complete and operational system that performs to the specifications and documents provided.
- All mechanical permits and inspection fees shall be obtained and paid by the mechanical contractor.
- Contractor is responsible for materials and installing the work in accordance with all applicable local, state and national codes.
- Do not scale drawing for measurements.
- It is the contractor's responsibility to verify duct and pipe paths are free of obstruction and reroute as necessary should an obstruction occur.
- Contractor's responsibility to coordinate with the gas and power company to arrange and facilitate shutdown of utilities as necessary to integrate new system.
- It is the contractor responsibility to survey existing conditions and make adjustments to duct size, route and configurations to deliver the required air to the system zones.
- Install all equipment using the manufacturer's recommended installation procedures.
- It is the contractor's responsibility to notify and coordinate with building owner when work will cause any interruption in services to building whether utilities, path obstruction, etc..
- The contractor will provide protection of materials, tools and equipment during the construction phase including protective covers, skids, plugs, caps, boxes and temporary fences.
- All equipment shall be U.L. Listed.
- All cutting and patching of walls and floors for mechanical equipment shall be the responsibility of the mechanical contractor.
- It is the contractor's responsibility to field verify all dimensions and locations of existing and new equipment and the utilities supplying said equipment including but not limited to; hot water piping, chilled water piping, natural gas lines, control wires, data cables and electrical conduits.
- Fire Alarm Control Panel (FACP) is Simplex model.

Mechanical Installation Requirements

- Furnish all labor, material and equipment required for the complete installation and operation of all systems in this section of work in accordance with recommended practice and all applicable codes.
- Mechanical contractor shall guarantee all work and materials for one year, effective the day the project is accepted by the owner. Refrigerant compressors shall be guaranteed for five years.
- Airtight seals shall be field applied mastic complying with UL 181 A-M or mastic tape complying with UL 181 A-P
- Provide and install permanent tags in a location that is readily visible on all installed equipment that includes all pertinent operating information including; make, model no., capacity, voltage, ampacity, heating data, cooling data. See specs for details.
- Contractor will locate equipment as such so that maintenance personnel will have access to panels, control boards and valves.
- Contractor will perform a test and balance of the system in accordance with the 2018 NCECC section 503.2.9. Test shall result in +5% to -5% of design flow.
- Contractor will follow the latest SMANCA HVAC Duct Construction Standards for duct sheet thickness and fastening methods.
- All control wire shall be provided by Mechanical Contractor.
- All pipe supports shall conform to ANSI/MSS SP - 69.
- Contractor to install manual air bleeds at the expansion tank high point and the water feed high point.
- Contractor to provide temperature gauges with snubbed connectors on the boiler supply and return piping.
- Contractor to provide 75 psi pressure temperature safety valve on supply pipe or boilers itself. See manufacturer's recommendations.
- Insulate and PVC jacket new piping with a minimum of 1 $\frac{1}{2}$ " fibrous insulation for pipes smaller than or equal to 1 $\frac{1}{2}$ " diameter and minimum of 2" fibrous insulation for pipes greater than 1 $\frac{1}{2}$ " diameter.
- Contractor will provide a functioning pressure test 200% max operating pressure by gradually raising pressure with boiler isolated from system and noting pressure rises per gauges.
- Contractor is to inspect the make-up water backflow preventer for compliance to the RPZ type. If backflow preventer is the RPz type then it is to remain. If not, contractor will replace.
- Contractor to submit for Dept of Labor inspections for boiler installation final.
- Contractor to submit for Gaston County inspections for project.

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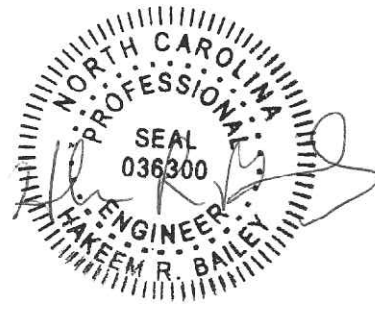
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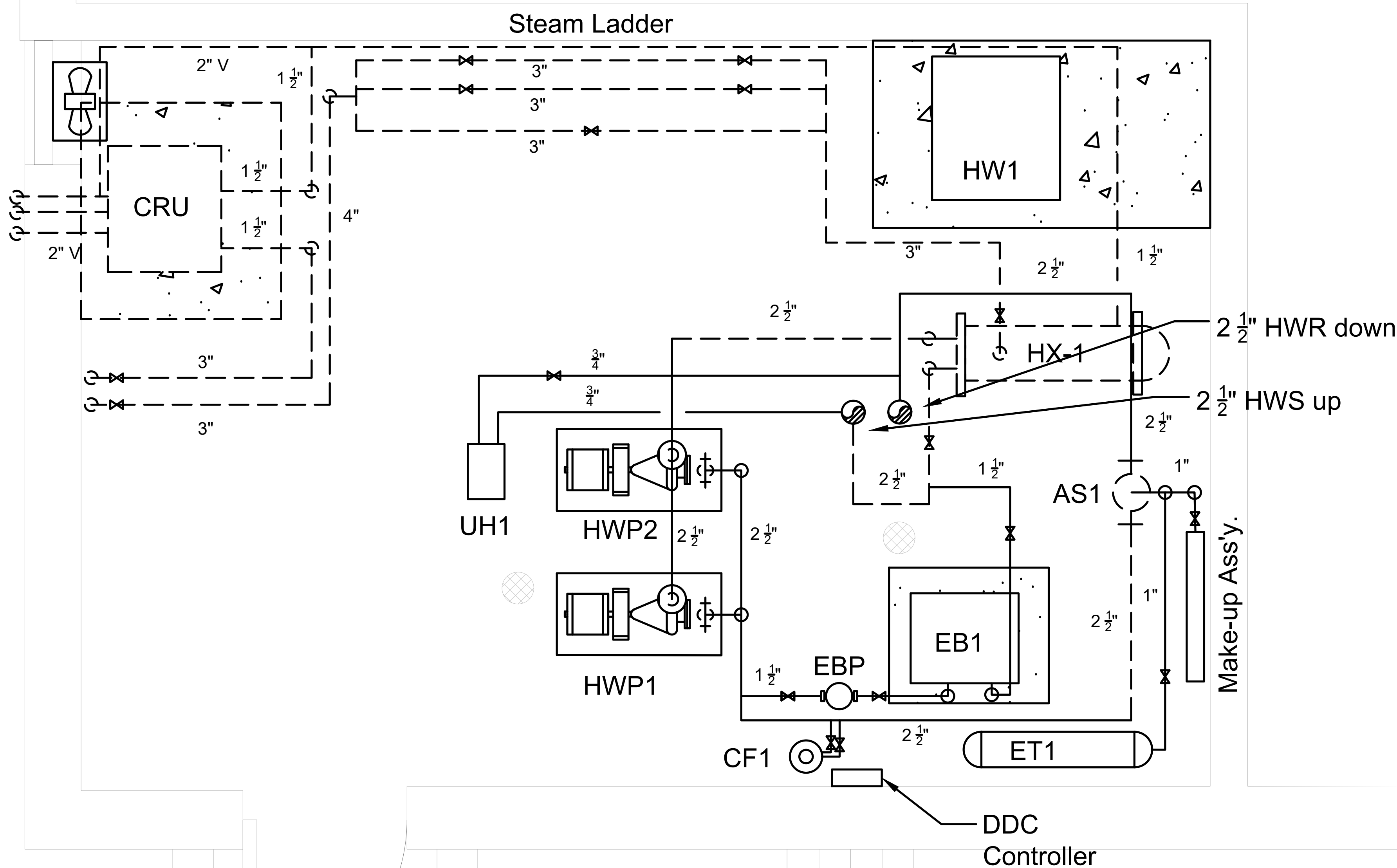
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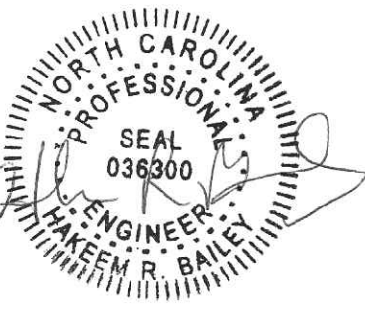


**Mechanical Demo Notes**

- Demolish the condensate recovery unit and associated piping and vents.
- Demolish condensate reclamation lines back to the boiler room wall. Cut and cap line.
- Demolish steam piping, ladder and valves back to the boiler room wall. Cut and cap line. Return control valves to Gaston College facilities.
- Demolish heat exchanger and associated piping.
- Demolish air separator.
- Demolish piping per plan to make adjustments for new piping plan.
- Existing hot water heater (HW1) to remain.
- Existing building heating loop pumps to remain.
- Existing electric boiler (EB1) and pump (EBP) to remain.
- Existing unit heater (UH1) to remain.
- Alternate 1: Demolish one shot chemical feeder.
- Alternate 1: Replace DDC Controller.

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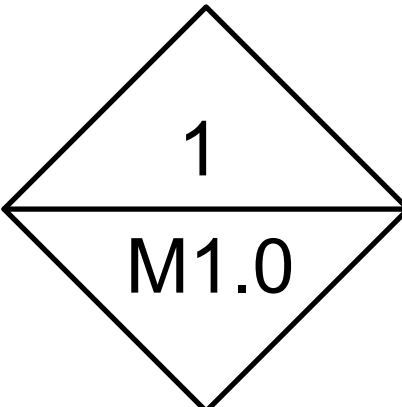
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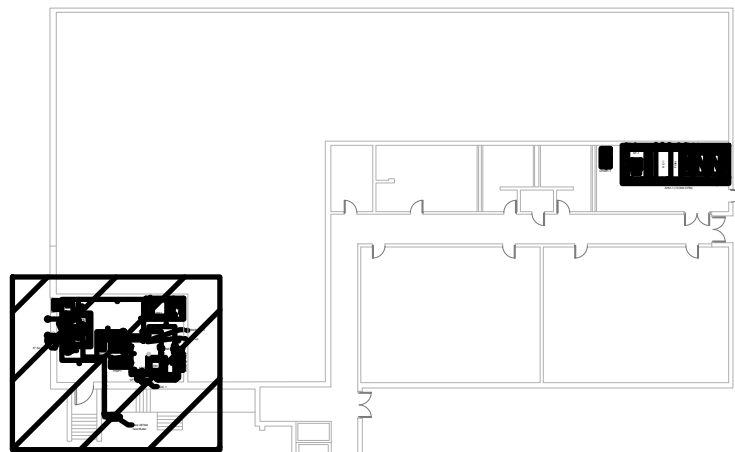
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Demo Plan

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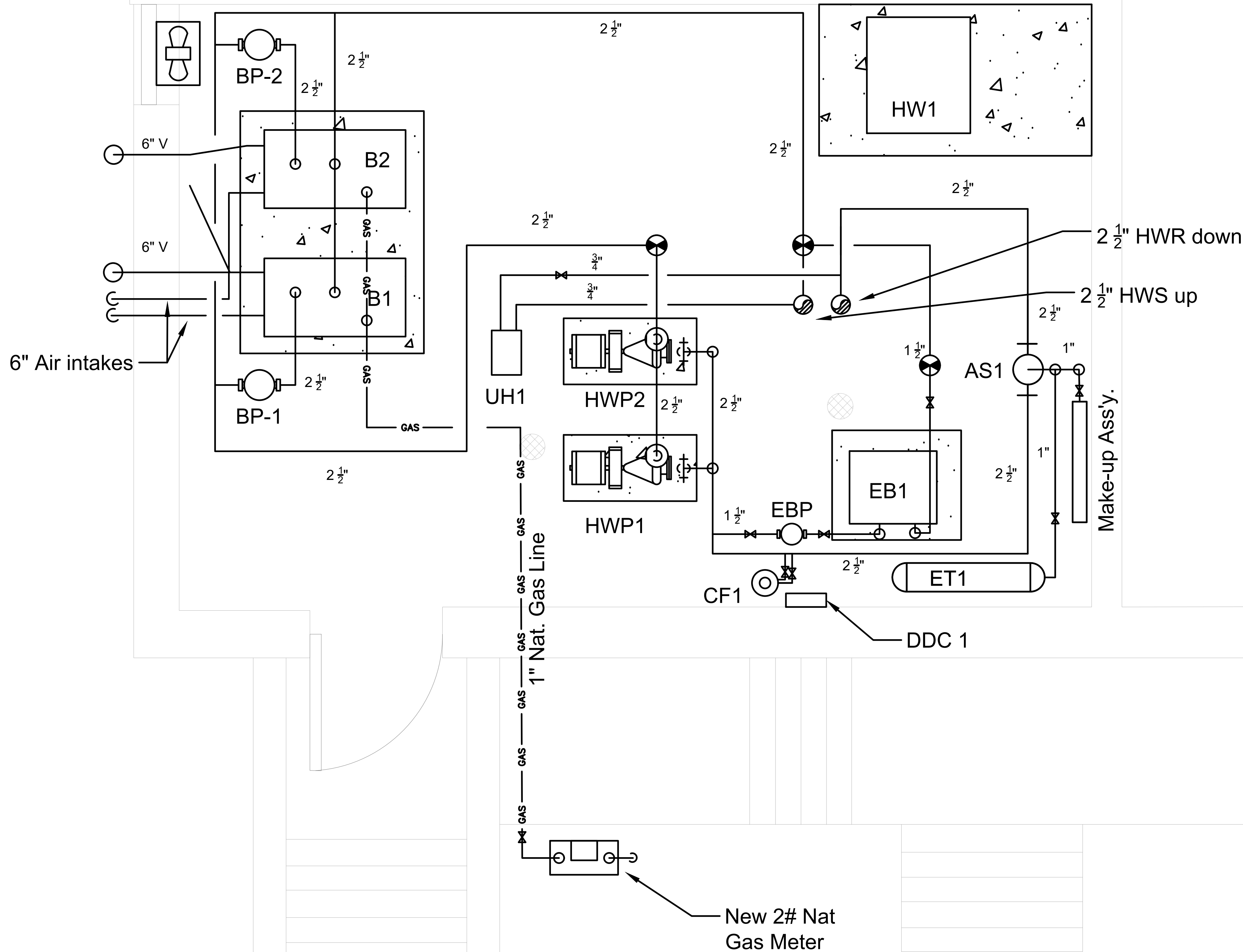


**Mechanical Demo Plan**

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**Key Plan**

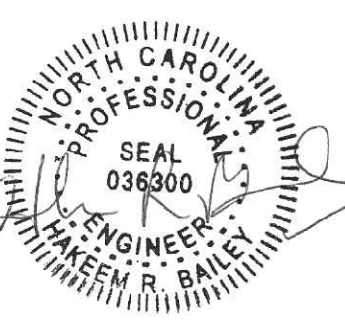


Mechanical Installation Notes

- 1. Install (2) new boilers on concrete pads. Route flue vents and outside air intakes to outside boiler room. Pest Screens are to be installed at the termination of the ducts Flash and seal all penetrations.
- 2. Install new circulating pumps for boilers. Pumps shall be VFD controlled and boiler logic sequenced.
- 3. Install new piping to connect boilers and equipment.
- 4. Install new air and dirt separator in lieu of the air separator. Adjust piping to accommodate change
- 5. Run new natural gas lines from new 2 psi meter to boilers.
- 6. Alternate 1: Add new one shot chemical feeder.
- 7. Alternate 1: Replace DDC Controller.

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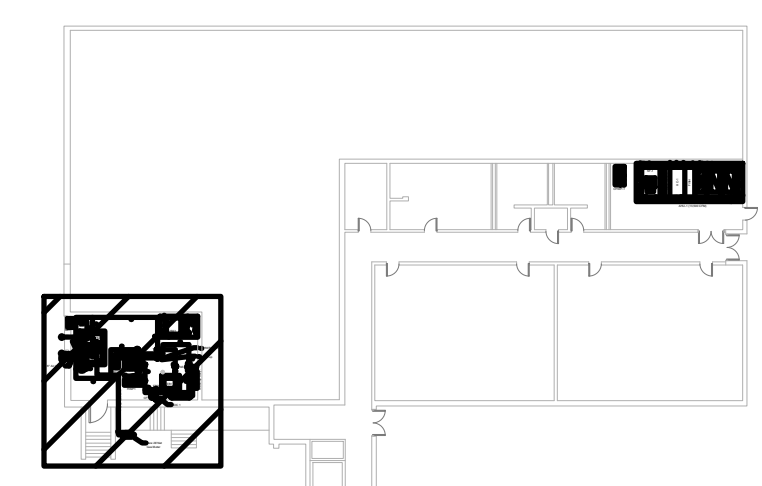
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Mechanical Plan  
Scale: 1/2" = 1' - 0"



Key Plan

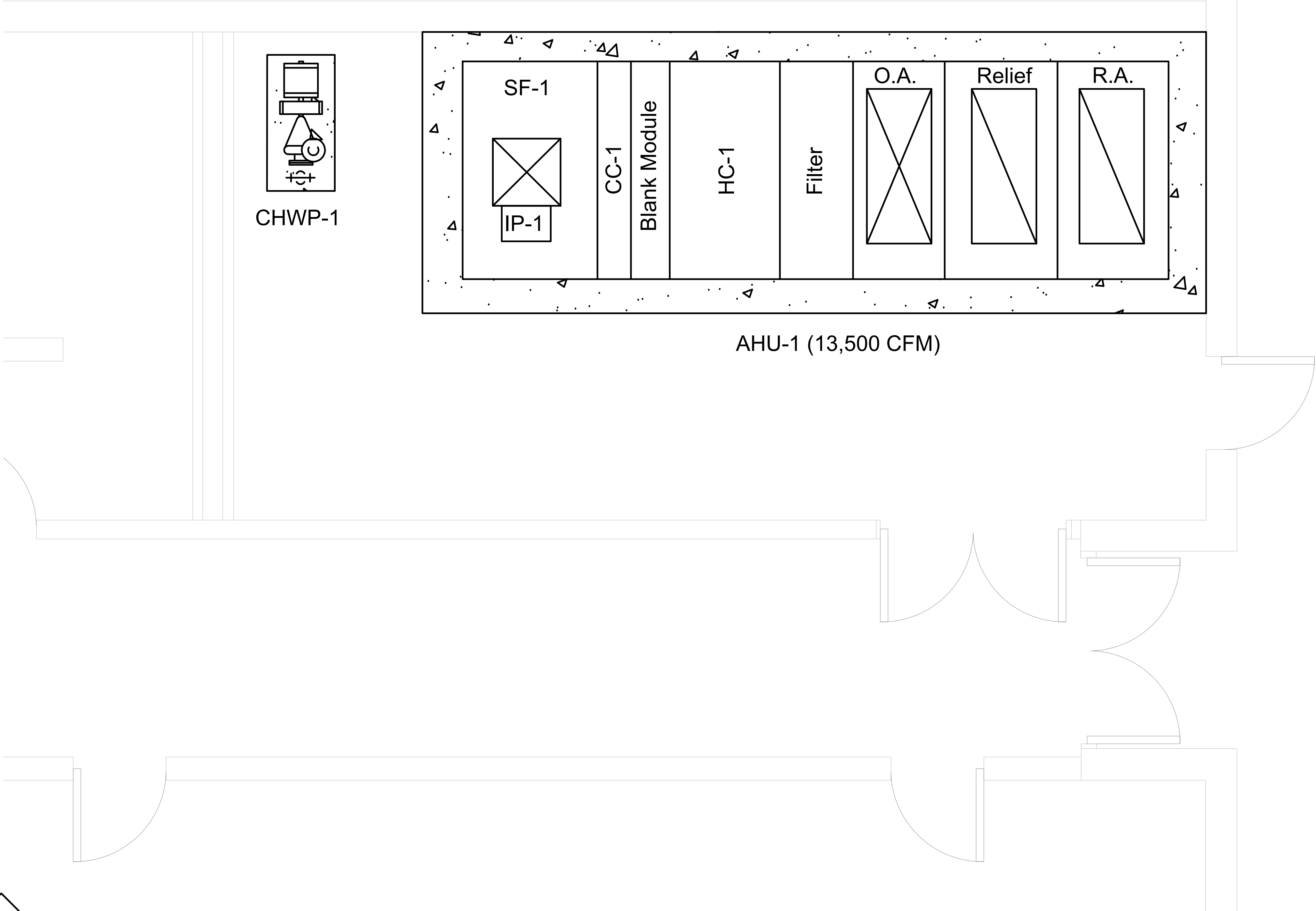
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M1.2

Mechanical Plan

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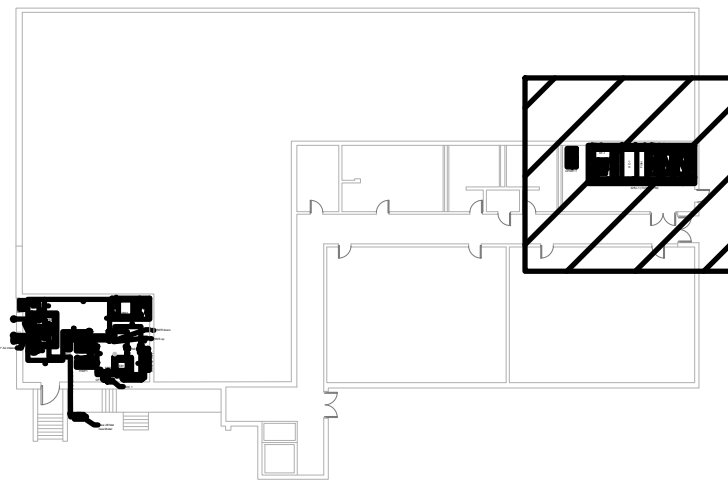


Mechanical Installation Notes

1.

Install Ion air purifying system in supply duct. Follow manufacturer's instructions. Seal duct airtight with mastic putty.
2.

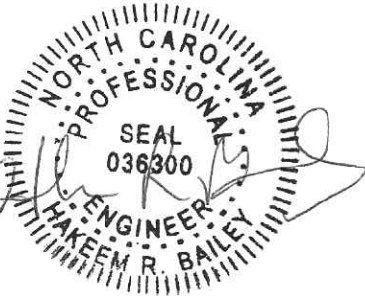
Interlock air purifier into AHU.



Key Plan

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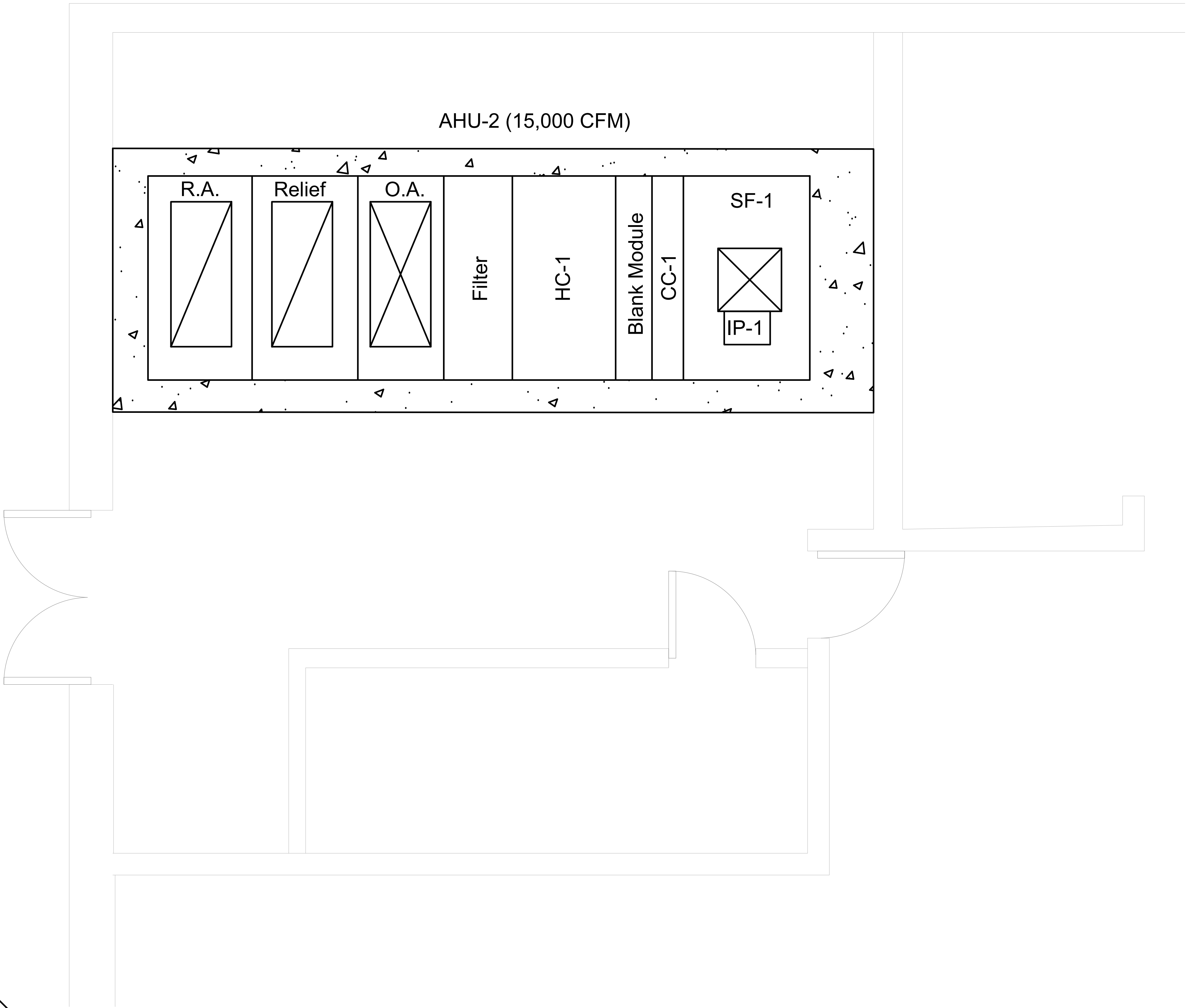
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Title: Mechanical Plan

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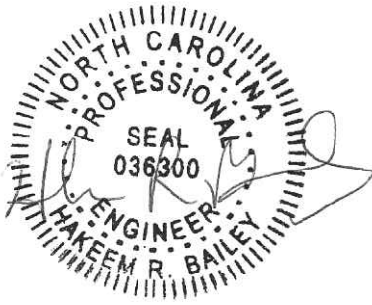


Mechanical Installation Notes

1. Install Ion air purifying system in supply duct. Follow manufacturer's instructions.  
Seal duct airtight with mastic putty.
2. Interlock air purifier into AHU.

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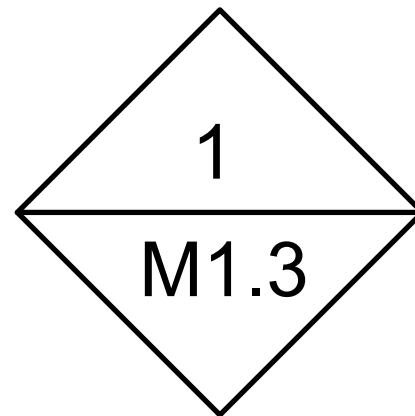
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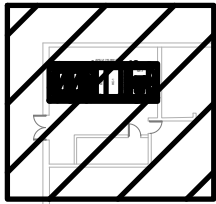
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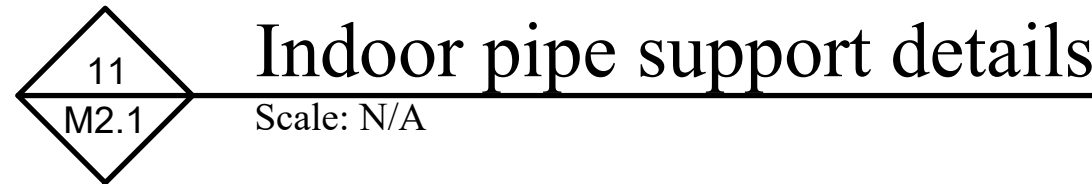
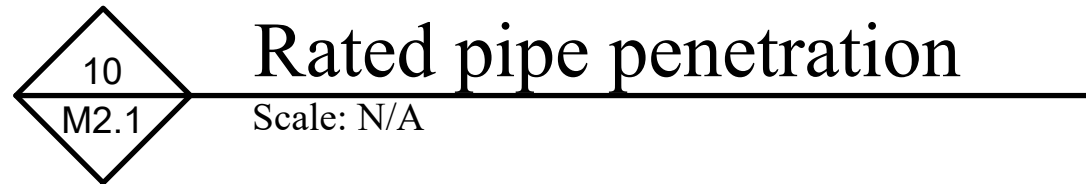
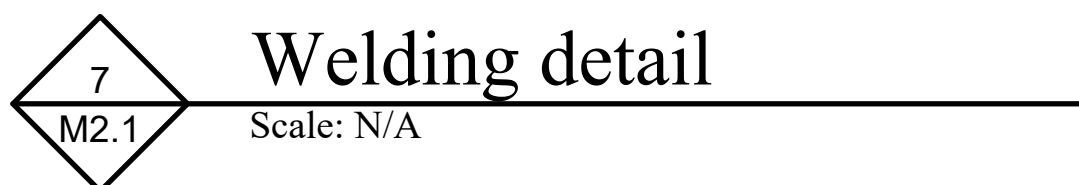
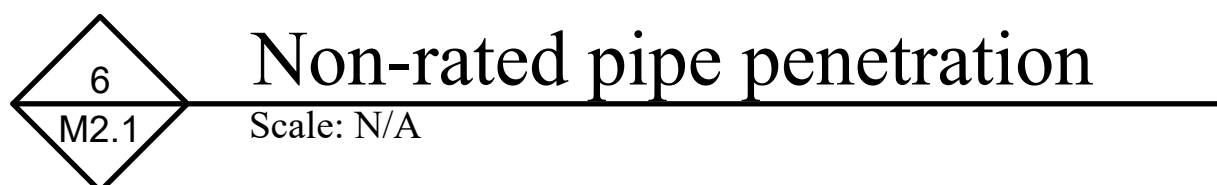
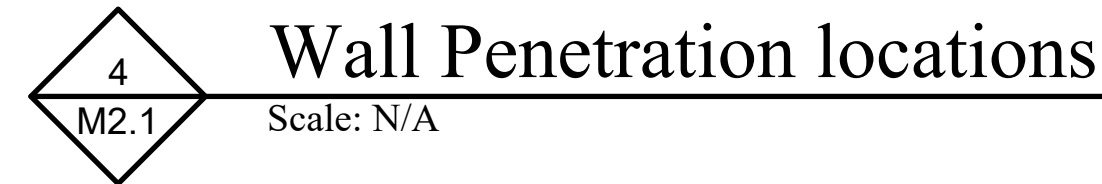
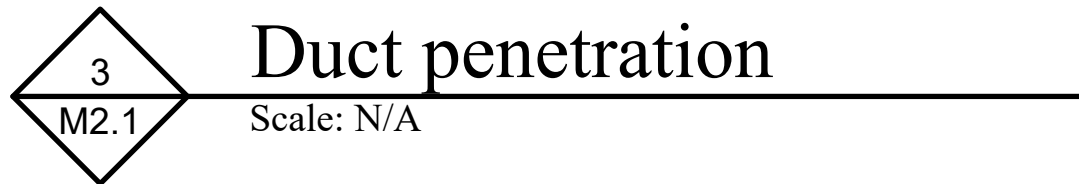
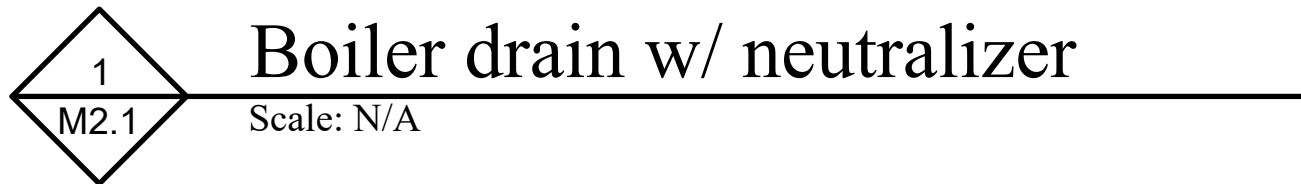


**Mechanical Plan**

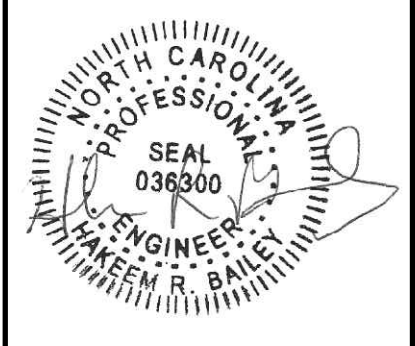
Scale:  $\frac{1}{2}$ " = 1' - 0"



**Key Plan**



Note:<



Seal: 07

## Revisions</

- Controls System Installation Requirements**
- Furnish all labor, material and equipment required for the complete installation and operation of all systems in this section of work in accordance with recommended practice and all applicable codes.
  - Existing building BAS controls are Philips Telnetrol. The building is on BACnet MS/TP.
  - New controls system architecture shall be BACnet IP or BACnet MSTP.
  - Control wires shall be shielded or run within conduit or EMT.
  - Main building temperature reading shall be from the network.
  - Approved controls architecture is to be open ended controls.
  - Occupied schedule, temperature points, equipment activate and bldg temp set-points shall be write-able.
  - Controls contractor will submit architecture and sequence to the engineer and Gaston College project personnel for approval prior to installation.
  - Add an extension to the existing Telnetrol controller or a new BACnet MS/TP controller.
  - Modify the existing boiler program in the Telnetrol controller. If a new MS/TP controller was used create a program in it to run the boiler plant and pick up AHU UV lights. The UV lights should be connected to the controllers that control each AHU (existing Distech) that way if the network fails the AHUs function correctly.
  - Pull the new points into the JACE.
  - Create alarms in the JACE and link the building programming.
  - Modify the graphics in the supervisor. Controls graphics will match existing graphics in format.
  - All Zones shall have temperature and humidity sensors with offset control without displays.
  - All AHUs shall have all VFDs integrated via BACnet for monitoring only. Start/Stop commands shall come from an I/O controller.
  - All actuators shall have a position feedback connected to the controller.
  - Chillers/Boilers shall only receive setpoint commands via BACnet. Start/Stop shall be via I/O controller.
  - Boilers shall have BACnet Gateways.
  - Chillers shall have BACnet communications.
  - AHUs Shall have Optimal Start implemented based on zone terminal load. Optimal Start shall have an Enable/Disable Point.
  - SAT Reset shall be implemented via an average terminal load. Reset shall have an Enable/Disable Point.
  - Duct Static Reset shall be implemented with a target setpoint of 90% (set). Duct static may be adjusted from .8 to 1.5"wc at a max rate of .1"wc every 3 minutes. Reset shall have an Enable/Disable Point.
  - HW/CWV Reset shall be implemented based on Min and Max terminal loads. Loads shall be calculated from the zones not the AHUs unless they are constant volume. Reset shall have an Enable/Disable Point.
  - The building shall receive setpoints from the supervisor station. All setpoint changes shall be done via override. The Set, Emergency Override, and Emergency Auto shall be hidden from the end user.
  - All trends shall be done in the supervisor.
  - All Space Temperature and Humidity shall have alarms on them. The alarm blocks shall receive an alarm distance from setpoint value, a delay from schedule change value, and a delay time from the supervisor station. There will all need to be integrated into each alarm.
  - All Actuators shall have an alarm that will use the delay time value and actuator deviation setpoint from the supervisor station.
  - No graphics shall reside on the JACE.
  - ALL ADMIN CREDENTIALS SHALL BE GIVEN TO THE BAS INTEGRATOR. This includes any controller level username and passwords. Winning contractor shall be given outside access via a Taisbox to their JACE only for the one year warranty.
  - Sensors shall be: Analog Temperature Sensors- 10K Type II, All Non-Temperature Sensors- 0(2)-10 VDC, Actuators/Control Valves Brand- Belimo.

### Boiler Room Sequence of Operations:

Main building is occupied 7 days a week 24 hrs a day.  
Indoor Bldg Temp shall be supplied by the BAS.  
Heating Mode:  
When occupied (occupied mode shall 7 day programmable and initially set for 24 hours, 7 days a week) and,  
When outside air temperature is below 60 deg F and indoor bldg temp is below setpoint; HWP 1 will activate.  
When outside air temperature is below 60 deg F and pressure sensor has increased verifying flow then;  
Boiler 1 will activate.  
When boiler has been active for 30 minutes then;

Boiler 1 will operate per the following initial setback schedule by modulating the burner output: Outside air temp is under 60 deg F then leaving water temp shall be 140 deg F  
Outside air temp is over or equal 45 deg F then leaving water temp shall be 145 deg F  
Outside air temp is under 25 deg F then leaving water temp shall be 165 deg F  
Outside air temp is under 0 deg F then leaving water temp shall be 180 deg F

System shall be capable to maintain up to 80 deg F in building under testing conditions.

Boiler 1 shall use internal controls to vary the flow turn down synchronized with boiler heat transfer turn down to maintain optimal heat transfer efficiency. Boiler 1 will also control the primary pump BP-1.  
Boiler 2 shall become active when building demand requires additional heating capacity and shall duplicate Boiler 1 controls and sequences.  
When there is enough heat in the supply loop; then HWP 1 will remain active and the boiler will switch in stand-by mode until water temp drops 10 degrees.

Boiler 1 and Boiler 2 shall rotate the lead/lag sequence with Boiler 2 becoming lead after a set time, Time shall be write-able initially set at 672 hours of operation.

If building set point cannot be maintained with HWP 1 active then HWP 2 shall activate for additional capacity.

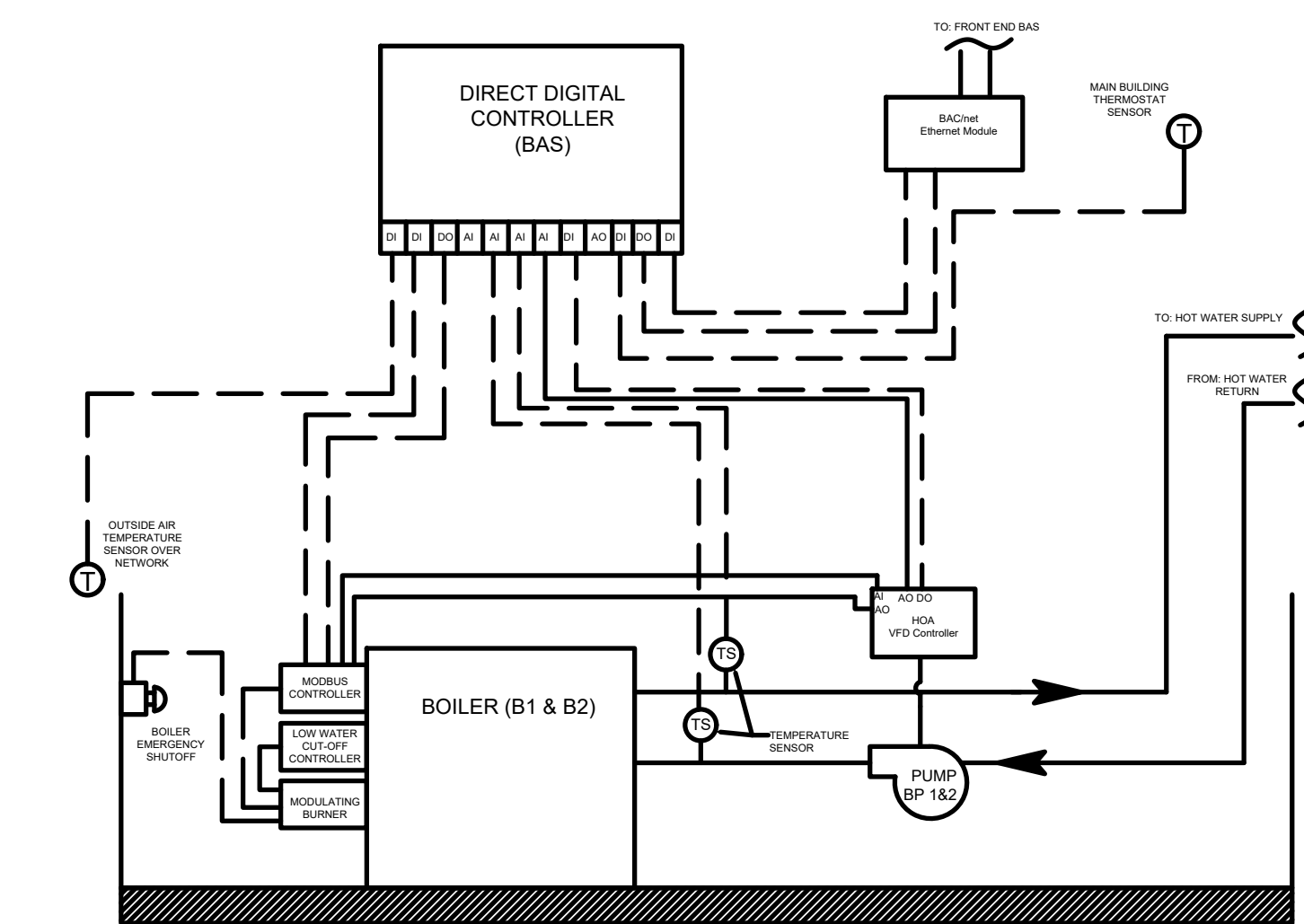
HWP 2 will activate if HWP 1 fails and vice versa.

Boiler 1 and Boiler 2 shall rotate the lead/lag sequence with Boiler 2 becoming lead after a set time, Time shall be write-able initially set at 672 hours of operation.

HWP 1 and HWP 2 shall rotate the lead/lag sequence. Time shall be write-able initially set at 672 hours of operation.

Cooling Mode:  
When outside air temperature is above 60 deg F and indoor bldg temp is above setpoint then;  
Boiler 1 and Boiler 2 will switch to reheat mode.  
When boilers deactivate then;  
HWP 1 will remain on for reheat functionality.  
HWP 2 will remain on for reheat functionality.  
BP-1 will remain on for reheat functionality.  
BP-2 will remain on for reheat functionality.

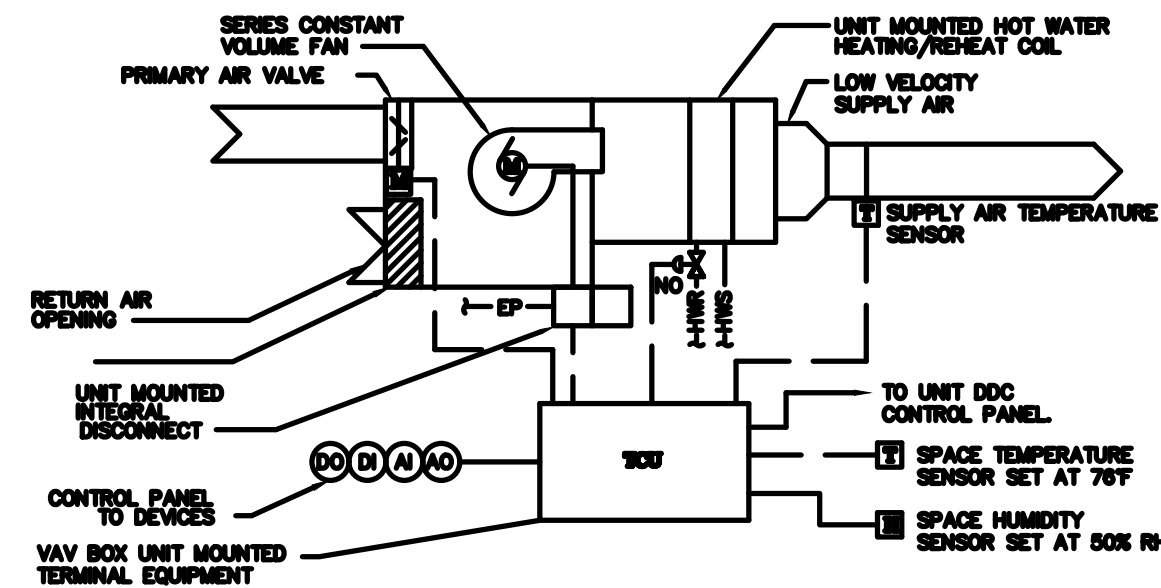
Faults:  
When any fault condition is present the network screen will alarm until fault conditions are acknowledged and cleared.  
When a low water fault occurs, then boiler will deactivate.  
When emergency boiler cut-off switch is active, then boiler will deactivate.  
When boiler reaches and overpressure condition, then boiler will deactivate.  
Boiler will reactivate after all faults have been cleared.



- Boiler Start-Up and Shutdown Procedures:**
- Boiler Shutdown:
- Decrease building load as much as possible.
  - Turn boiler switch off. If control power from burner is used to support accessories, leave on until boiler system has cooled down.
  - Shut and lock manual gas valves as applicable.
  - Shut down the non-return valve and the back up valve. Lock them shut.
  - Allow the boiler feed pump to remain active. As the boiler cools down, the water level is reduced by demand or shrinkage. It is best to be aware of the boiler level at all times.
  - When boiler pressure has decreased to 5 to 10 psi on the pressure gauge, open the boiler manual vent valve on the top of the boiler. This is to act as a sentinel against the increase in pressure and to prevent the boiler from going into a vacuum. Lock the valve open.
  - When boiler and water are below 120°F, shut off power to the unit and lock out the circuit breakers.
  - Open front and rear doors for observation of freeds surfaces.
  - Drain boiler down completely. Make sure the vent valve on the top of the boiler remains open.
  - Open and lock the float control low water cutoff drain valves. These will serve as additional vents.
  - Shut and lock the boiler feed valves.
- Boiler Start-Up:
- Flush all the affected piping to clear the system of contaminants and sludge.
  - In a hot water heating system, the boiler and the entire system (other than the tank) must be full of water for satisfactory operation. Water should be added to the system until the boiler pressure gauge registers normal system design operating pressure. To ensure that the system is full, water should come out of all air vents when opened.
  - Check wiring of all fuel valves. Verify that wiring is correct according to the factory supplied wiring diagram.
  - Leave all manual fuel valves closed. This includes manual shutoff valves supplied with the boiler and facility installed valves at the boiler site.
  - Perform all burner pre-startup checks according to the burner manufacturer's specifications.
  - Refer to the burner manufacturer's installation manual furnished with the boiler.
  - Turn boiler on and verify that fuel valves are closed during the burner pre-purge cycle. Turn boiler off and disconnect power.
  - Adjust burner according to the burner manufacturer's specifications. Target CO2 level is 13% for optimum efficiency, but a range of 12.5 - 13.5% is acceptable.
  - Ensure the boiler controls are set-up properly with special attention to the low water cut-off controls.
  - Check Operating Control: Raise and lower operating control setting as required to start and stop burner.
  - Check High Limit Control: Jumper Operating Control Terminals. Allow Burner to operate until shut down by limit. Installation is not considered complete until this check has been made.
  - Check Low Water Cut-Off Control with water level at normal waterline. Raise operating control setting to allow burner to operate. Open boiler drain to allow water level to drop until burner operation is shut down by low water level.
  - Ensure boiler is not allowed to operate below the minimum permissible water level as indicated on the boiler.
  - Close boiler drain and refill to normal water line. Unless boiler is equipped with a manual reset low water cutoff, burner should automatically restart during fill. Reset operating control.

| Point Name            | Hardware Points |      |      |      | Software Points |      |          |       |
|-----------------------|-----------------|------|------|------|-----------------|------|----------|-------|
|                       | A.I.            | A.O. | D.I. | D.O. | A.S.            | D.S. | Schedule | Trend |
| Outside Air Temp      |                 |      | X    |      |                 |      |          | X     |
| Boiler (B1&2) On/Off  |                 |      | X    | X    |                 | X    | X        |       |
| Boiler (B1&2) Status  |                 |      |      | X    |                 |      | X        | X     |
| Boiler (B1&2) Control | X               | X    |      |      |                 |      | X        |       |
| Pressure Sensor       | X               |      |      |      |                 |      |          |       |
| Leaving Water Temp    | X               |      |      |      |                 |      |          | X     |
| Boiler Pump (1&2)     |                 |      |      | X    |                 |      |          |       |
| Pump Status           |                 |      | X    |      |                 |      |          | X     |
| Bldg Temp Setpoint    |                 |      |      |      |                 | X    | X        | X     |
| Occupied Schedule     |                 |      |      |      | X               |      | X        |       |
| Return Water Temp.    | X               |      |      |      |                 |      |          | X     |
| HWP - (1 & 2)         | X               | X    |      |      | X               |      |          | X     |
| Errors                |                 |      |      |      |                 |      |          | X     |
| Totals:               |                 |      |      |      |                 |      |          |       |

TOTAL HARDWARE POINTS: 13  
TOTAL SOFTWARE POINTS: 16  
LEGEND:  
AI = ANALOG INPUT  
AO = ANALOG OUTPUT  
DI = DIGITAL INPUT  
DO = DIGITAL OUTPUT  
AS = ANALOG SETPOINT  
DS = DIGITAL SETPOINT



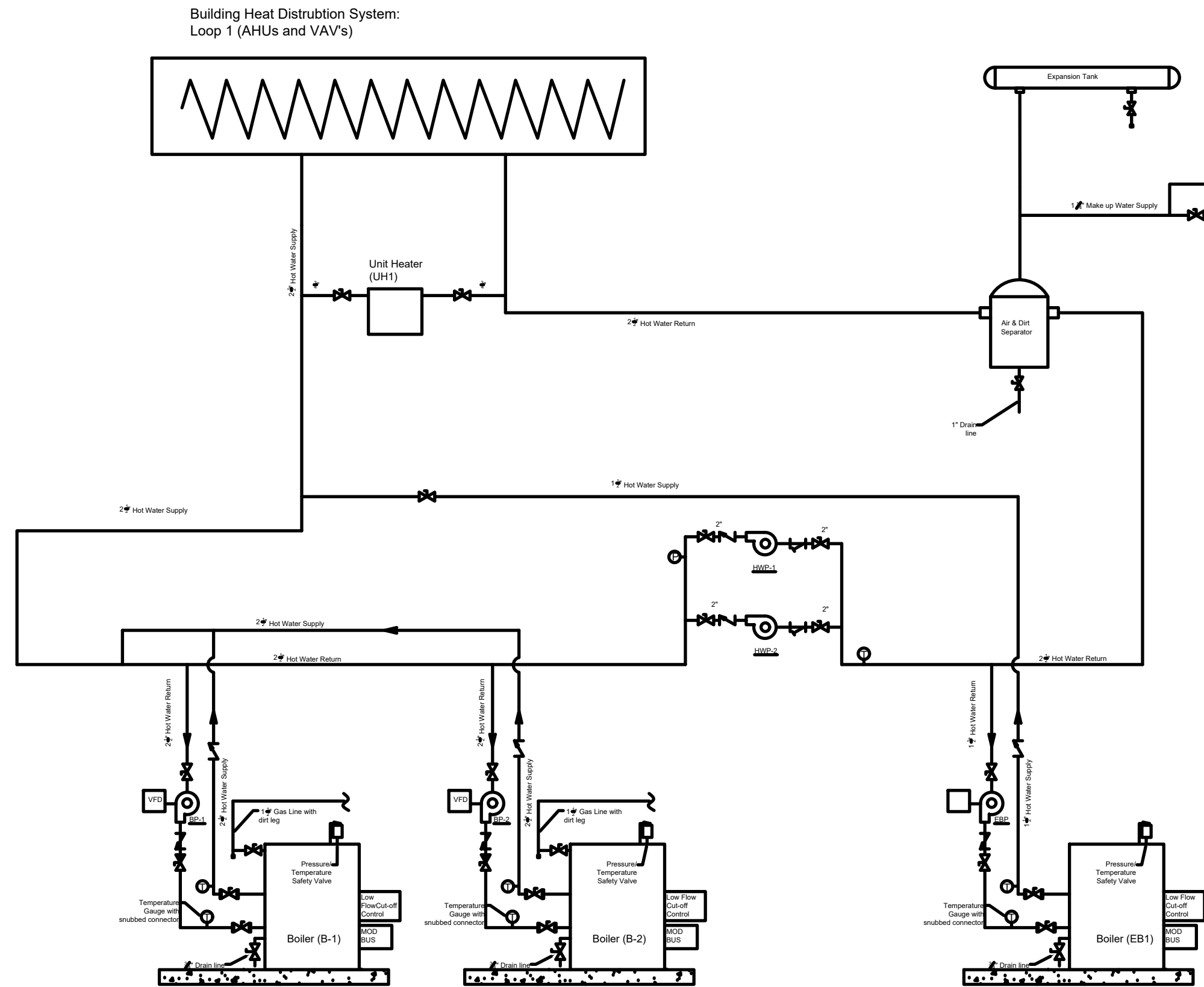
### SEQUENCE OF OPERATION

WHEN THE ASSOCIATED AIR HANDLING UNIT CONTROLS ARE ENERGIZED BY THE DDC CONTROL PANEL, THE FAN POWERED VAV BOX CONTROL SHALL BE ENABLED AND THE VAV BOX FAN ENERGIZED (BEFORE THE AIR HANDLING UNIT SUPPLY FAN IS ENERGIZED) AND SHALL RUN CONTINUOUSLY. ON A RISE IN SPACE TEMPERATURE, AS SENSED BY THE VAV BOX SPACE TEMPERATURE SENSOR, THE UNIT PRIMARY AIR VALVE SHALL MODULATE OPEN TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE SPACE THERMOSTAT MODULATES THE HEATING COIL VALVE TO REHEAT AIR, WHEN NECESSARY, TO MAINTAIN SPACE TEMPERATURE. ON A CONTINUED FALL IN SPACE TEMPERATURE, THE UNIT PRIMARY AIR VALVE SHALL MODULATE TO ITS MINIMUM POSITION AND THE UNIT HOT WATER HEATING COIL TWO-WAY VALVE SHALL MODULATE OPEN TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE HUMIDISTAT MODULATES PRIMARY AIR VALVE TO PROVIDE NECESSARY DEHUMIDIFICATION. IT ALSO CONTROLS THE PRIMARY AIR VALVE IN SEQUENCE WITH HEATING IF SPACE HUMIDITY RISES ABOVE SET POINT BY MODULATING OPEN THE PRIMARY AIR VALVE. ON A FALL IN SPACE HUMIDITY, THE REVERSE OPERATION SHALL OCCUR.

DURING OPTIMUM START AND NIGHT SETBACK, THE RESPECTIVE AIR HANDLING UNIT SHALL BE DE-ENERGIZED. DURING OPTIMUM START AND NIGHT SETBACK, THE UNIT PRIMARY AIR VALVE SHALL BE CLOSED, THE UNIT HEATING CONTROL VALVE SHALL BE OPEN AND THE VAV BOX FAN SHALL OPERATE. (VAV BOX FAN WILL NOT OPERATE DURING NIGHT SETBACK EXCEPT TO MAINTAIN THE NIGHT SETBACK TEMPERATURE). THE RESPECTIVE AIR HANDLING UNIT SHALL BE ENERGIZED BY ITS DDC CONTROL PANEL ACCORDING TO A PREDETERMINED SCHEDULE AND THE UNIT PRIMARY AIR VALVE SHALL RETURN TO ITS MINIMUM OPEN POSITION.

## 3 VAV Controls & Seq. of Ops.

M3.1 Scale: N/A



## 2 Boilers P and ID

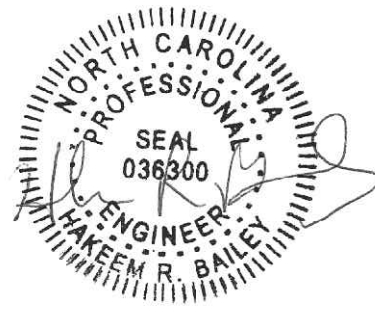
M3.1 Scale: N/A

## 1 Boilers Controls Diagram

M3.1 Scale: N/A

**AeroRaq Engineering Inc**  
*Engineering Services*  
8511 Davis Parkway, Suite C6-205  
Charlotte, North Carolina 28269  
Firm License # C-3509  
Phone: 704 469 8463

Note:  
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Seal: 07/09/2026

### Revisions

| No. | Date |
|-----|------|
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**Lena Sue Beam Boiler Addition**  
Gaston College  
201 Hwy 321 South.  
Dallas, North Carolina 28034

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Project No:  
01-2026005

Scale: N/A

Date: 03-24-2026

Title: Mechanical Controls

# M3.1

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL  
PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
- A. Drawings: E0.1, E1.1, E1.2, E3.1 and E3.2

- 1.2 SUMMARY
- A. This section includes the following
1. Electrical equipment coordination and installation.
2. Common electrical installation requirements.

- 1.3 COORDINATION
- A. Contractor shall contact the Gaston County Inspections to schedule electrical equipment:
1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.

- PART 2 - PRODUCTS
- 2.01 MANUFACTURERS
- A. Manufacturers: Subject to compliance with requirements, provide products by standard electrical supply manufacturers.

- 2.2 INSPECTIONS
- A. Contractor shall contact the Gaston County Inspections to schedule electrical inspections and to schedule a final inspection.

- PART 3 - EXECUTION
- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
- B. Comply with NEC
- C. Comply with North Carolina Electrical Building Code
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. EMT to be used only in dry indoor locations with steel compression fittings and connectors.

END SECTION 260500

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES  
PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
- A. Drawings: E0.1 and E1.1

- 1.2 SUMMARY
- B. This section includes the following
1. Requirements for building wire and cable

- 1.3 COORDINATION
- A. Coordinate electrical testing of electrical items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

- PART 2 - PRODUCTS
- 2.01 MANUFACTURERS
- A. Manufacturers: Subject to compliance with requirements, provide products by standard electrical supply manufacturers.
- B. All building wire and cables should be listed by a North Carolina "approved" third party testing agency

- 2.2 INSPECTIONS
- A. Contractor shall contact the Gaston County Inspections to schedule electrical inspections and to schedule a final inspection.

- PART 3 - EXECUTION
- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
- B. Comply with NEC
- C. Comply with North Carolina Electrical Building Code

- 3.2 WORK REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Provide and install an individual neutral wire for each branch circuit.
- B. Conductors for power and lighting that are sized #10 AWG and smaller shall be solid copper conductors. All power conductors that are #8 AWG and larger shall be class B stranded copper conductors.
- C. The minimum size for power branch circuit wiring is #12 AWG.
- D. Fire alarm and control wiring may be equipped with stranded conductors that are sized #14 AWG.
- E. Branch circuit conductors should be sized to prevent a voltage drop exceeding (3%) and the maximum voltage drop on both feeders and branch circuits should not exceed (5%)

- F. Provide and install a full size individual neutral wire for each circuit.
- G. The insulation type for interior wiring shall be dual-rated THHN/THWN or XHHW.
- H. Where the conductor length from the panel to the first outlet on a 277 volt circuit exceeds 125 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG.
- I. Where the conductor length from the panel to the first outlet on a 120 volt circuit exceeds 50 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG.
- J. Joints in solid conductors shall be spliced using Ideal "wirednuts", 3M Company "Scotchlock" or T&B connectors in junction boxes, outlet boxes and lighting fixtures.
- K. "Sta-kon" or other permanent type crimp connectors shall not be used for branch circuit connections.
- L. Joints in stranded conductors shall be spliced by approved mechanical connectors and gum rubber tape or friction tape. Solderless mechanical connectors for splices and taps, provided with U/L-approved insulating covers, may be used instead of mechanical connectors plus tape.
- M. Conductors, in all cases, shall be continuous from outlet to outlet and no splicing shall be made except within outlet or junction boxes, troughs and gutters.
- N. The feeder, branch circuits shall be color coded.

END SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- PART 1 - GENERAL
- 1.1 RELATED DOCUMENTS
- A. Drawings: E0.1 and E1.1

- 1.2 SUMMARY
- C. This section includes the following
2. Grounding and bonding for raceways

- 1.3 COORDINATION
- A. Coordinate electrical testing of electrical items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

- PART 2 - PRODUCTS
- 2.01 MANUFACTURERS
- A. Manufacturers: Subject to compliance with requirements, provide products by standard electrical supply manufacturers.
- B. All building wire and cables should be listed by a North Carolina "approved" third party testing agency

- 2.2 INSPECTIONS
- A. Contractor shall contact the Gaston County Inspections to schedule electrical inspections and to schedule a final inspection.

- PART 3 - EXECUTION
- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
- B. Comply with NEC
- C. Comply with North Carolina Electrical Building Code

- 3.2 WORK REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. The raceway system shall be not be relied on for ground continuity. A green grounding conductor, properly sized per NEC Table 250-122, shall be run in all power raceways."
- B. Provide and install a green grounding conductor in all power
- C. Test grounding and bonding system with a ground resistance tester demonstrating the resistance to ground is less than 25 ohms. Where the resistance is more than 25 ohms additional grounding will be required.
- D. Grounding conductors, where insulated, shall be colored solid green. Conductors intended as neutral shall be colored solid white on 120/208 volt circuits and natural gray on 277/480 volt circuits.

END SECTION 260526

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

- PART 1 - GENERAL
- 1.1 RELATED DOCUMENTS
- A. Drawings: E0.1 and E1.1

- 1.2 SUMMARY
- A. This section includes the following
1. Identification and labeling electrical systems

- 1.3 COORDINATION
- A. Electrician will properly label all electrical equipment with labels.

- PART 3 - EXECUTION
- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
- B. Comply with NEC
- C. Comply with North Carolina Electrical Building Code

- 3.2 WORK REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Furnish and install engraved laminated phenolic nameplates for all safety switches, panelboards, transformers, switchboards, motor control centers and other electrical equipment supplied for the project for identification. Nameplates shall be securely attached to equipment with self-tapping stainless steel screws; if the screw sharp end is protected; otherwise Rivets shall be used. Letters shall be approximately 1/2 inch high minimum. Embossed, self-adhesive plastic tape is not acceptable for marking equipment. Nameplate material colors shall be:
1. Blue surface with white core for 120/208 volt equipment.
2. Black surface with white core for 277/480 volt equipment.
3. Bright red surface with white core for all equipment related to fire alarm system.
4. Dark red (burgundy) surface with white core for all equipment related to security.
5. Green surface with white core for all equipment related to "emergency" systems.
6. Orange surface with white core for all equipment related to telephone systems.
7. Brown surface with white core for all equipment related to data systems.
8. White surface with black core for all equipment related to paging systems.
9. Purple surface with white core for all equipment related to TV systems.
- B. All empty conduit runs and conduit with conductors for future use shall be identified for use and shall indicate where they terminate. Identification shall be by tags with string or wire attached to conduit or outlet.
- C. All outlet boxes, junction boxes and pull boxes shall have their covers and exterior visible surfaces painted with colors to match the surface color scheme outlined above. This includes covers on boxes above lift-out and other type accessible ceilings.

END SECTION 260553

SECTION 262726 - WIRING DEVICES

- PART 1 - GENERAL
- 1.1 RELATED DOCUMENTS
- A. Drawings: E0.1 and E1.1

- 1.2 SUMMARY
- A. This section includes the following
1. Specifications for the installations of wiring devices

- 1.3 COORDINATION
- A. Coordinate electrical testing of electrical items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

- PART 2 - PRODUCTS
- 2.01 MANUFACTURERS
- A. Manufacturers: Subject to compliance with requirements, provide products by standard electrical supply manufacturers.
- B. Device shall be third party tested as noted per sub-section 3.2 part B.

- 2.2 INSPECTIONS
- A. Contractor shall contact the Gaston County Inspections to schedule electrical inspections and to schedule a final inspection.

- PART 3 - EXECUTION
- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
- B. Comply with NEC
- C. Comply with North Carolina Electrical Building Code

- 3.2 WORK REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Toggle switches shall be single pole, three-way, or four-way as indicated on the drawings. Switches shall be of the grounding type, with hex-head grounding screw, rated 20A, 120/277 volt, A.C only. Lighted handle switches shall have neon lights of the correct voltage rating where indicated on the drawings. All switches shall have quiet operating mechanisms without the use of mercury switches. All switches shall be listed by an "approved" third-party agency, approved for the voltage and amperage indicated.
- B. Cover plates for flush mounted wiring devices and for telephone outlets shall be Type "302" stainless steel or nylon type, standard size, single or ganged as shown on the drawings. Cover plate mounting screws shall be slotted head oval screws and shall match the finish and material of the plate, and shall be furnished with the plate by the plate manufacturer. Quantity of 2% spare cover plates of each type shall be provided to the owner.
- C. Switch and receptacle cover plates on exposed work shall be galvanized cast ferrous metal, standard size, and shall be single or ganged as indicated on the drawings.
- D. Exterior mounted switch and receptacle plates, and those noted to be weatherproof, shall be weatherproof PVC cover plates, standard size, single or ganged as indicated on the

- drawings, and shall be "approved" third party listed as "rain-tight while in use."
- E. All receptacles (unless otherwise noted) shall be federal specification grade duplex receptacles.

END SECTION 262726

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- PART 1 - GENERAL
- 1.1 RELATED DOCUMENTS
- A. Drawings: E0.1 and E1.1

- 1.2 SUMMARY
- A. This section includes the following
1. Specifications for the installations of safety switches

- 1.3 COORDINATION
- A. Coordinate electrical testing of electrical items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

- PART 2 - PRODUCTS
- 2.01 MANUFACTURERS
- A. Manufacturers: Subject to compliance with requirements, provide products by standard electrical supply manufacturers.
- B. Device shall be third party listed.

- 2.2 INSPECTIONS
- A. Contractor shall contact the Gaston County Inspections to schedule electrical inspections and to schedule a final inspection.

- PART 3 - EXECUTION
- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
- B. Comply with NEC
- C. Comply with North Carolina Electrical Building Code

- 3.2 WORK REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Safety switches shall be the "heavy duty" type. General duty switches are not acceptable.
- B. Switches shall have defeatable door interlocks that prevent the door from opening when the operating handle is in the "on" position.
- C. Switches shall have handles whose positions are easily recognizable in the "on" or "off" position. For safety reasons, padlock shall be provided for switches located in the public areas.
- D. Switches shall have non-teasible, positive, quick make-quick break mechanisms.
- E. Switches shall be properly labeled.

END SECTION 262816

General Installation Requirements

1. All installation work will be completed during normal business hours, exceptions will be made.
2. Competitive equipment may be used in lieu of models specified.
3. Drawing are diagrammatic, contractor will verify equipment positions and adjust power and controls conduit path accordingly.
4. Support conduit per NEC 2020.
5. Coordinate installation with other trades.
6. All wire must 75° C rated or higher, THW, THHW.

Electrical Installation Requirements

1. All electrical work must be done by a NC licensed electrician.
2. All electrical work must comply with the NEC 2020.
3. Wire connection shall be twist tied with appropriate sized cap.
4. All contractor provided electric materials, devices, appliances and equipment shall be label-listed by a North Carolina approved third party testing agency.
5. The new circuit breakers shall match existing breakers for actual interrupt capacity.
6. Conductors shall match existing color code as follows.
- 6.1. 277/480V, 3 Phase, 4 - Wire 208/120V, 3 Phase, 4-Wire
- 6.2. Phase A - Brown Phase A - Black
- 6.3. Phase B - Orange Phase B - Red
- 6.4. Phase C - Yellow Phase C - Blue
- 6.5. Neutral - Grey Neutral - White
7. Relocate light fixtures from under the location of the designated hood locations.
8. Surge Protector shall be Siemens TPS3 C 12 10 0 X 02 or equivalent.
9. Lockout breakers are required where lockable disconnect are not present.
10. Contractor to install circuits and update panels as shown in schedules.

Conductor Sizing Table

For 120V - 20A Branch Circuits Only, Unless Otherwise Noted

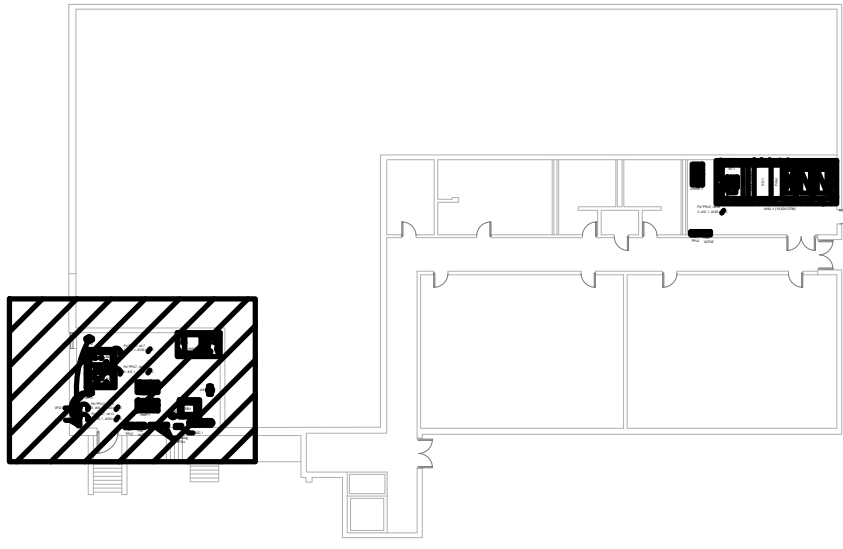
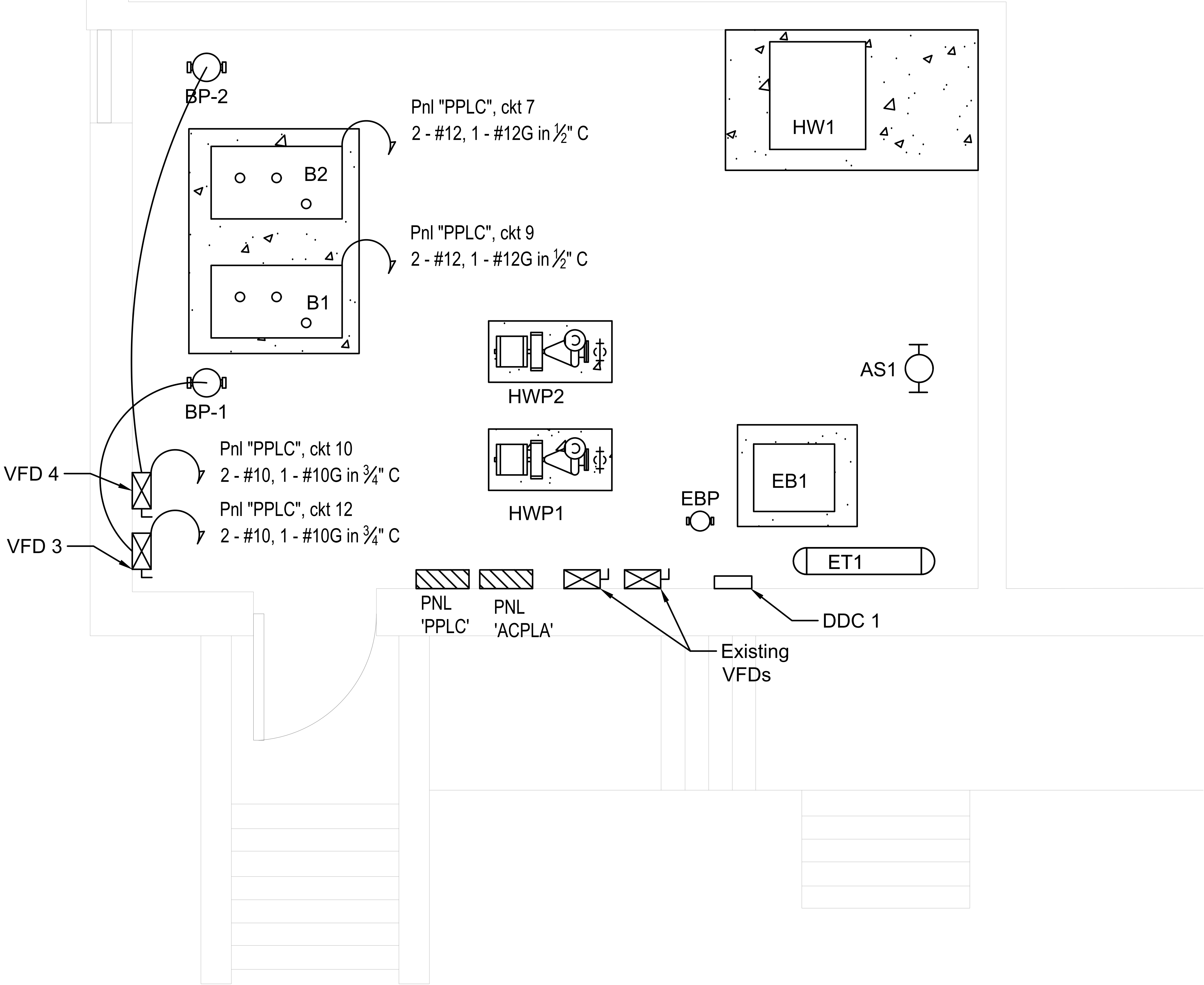
|                                                  |                                                                                                         |  |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------|--|
| If distance A + B in feet is (see diagram below) | Use copper wire in metallic conduit, AWG size as follows on entire circuit and size conduit accordingly |  |
| 0' to 100'                                       | #12 (min.)                                                                                              |  |
| 100' to 175'                                     | #10                                                                                                     |  |
| 175' to 300'                                     | #8                                                                                                      |  |
| 300' to 450'                                     | #6 (max.)                                                                                               |  |

For 277V - 20A Branch Circuits Only, Unless Otherwise Noted

|                                                  |                                                                                                         |  |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------|--|
| If distance A + B in feet is (see diagram below) | Use copper wire in metallic conduit, AWG size as follows on entire circuit and size conduit accordingly |  |
| 0' to 250'                                       | #12 (min.)                                                                                              |  |
| 250' to 400'                                     | #10                                                                                                     |  |
| 400' to 700'                                     | #8                                                                                                      |  |
| 700' to 1000'                                    | #6 (max.)                                                                                               |  |

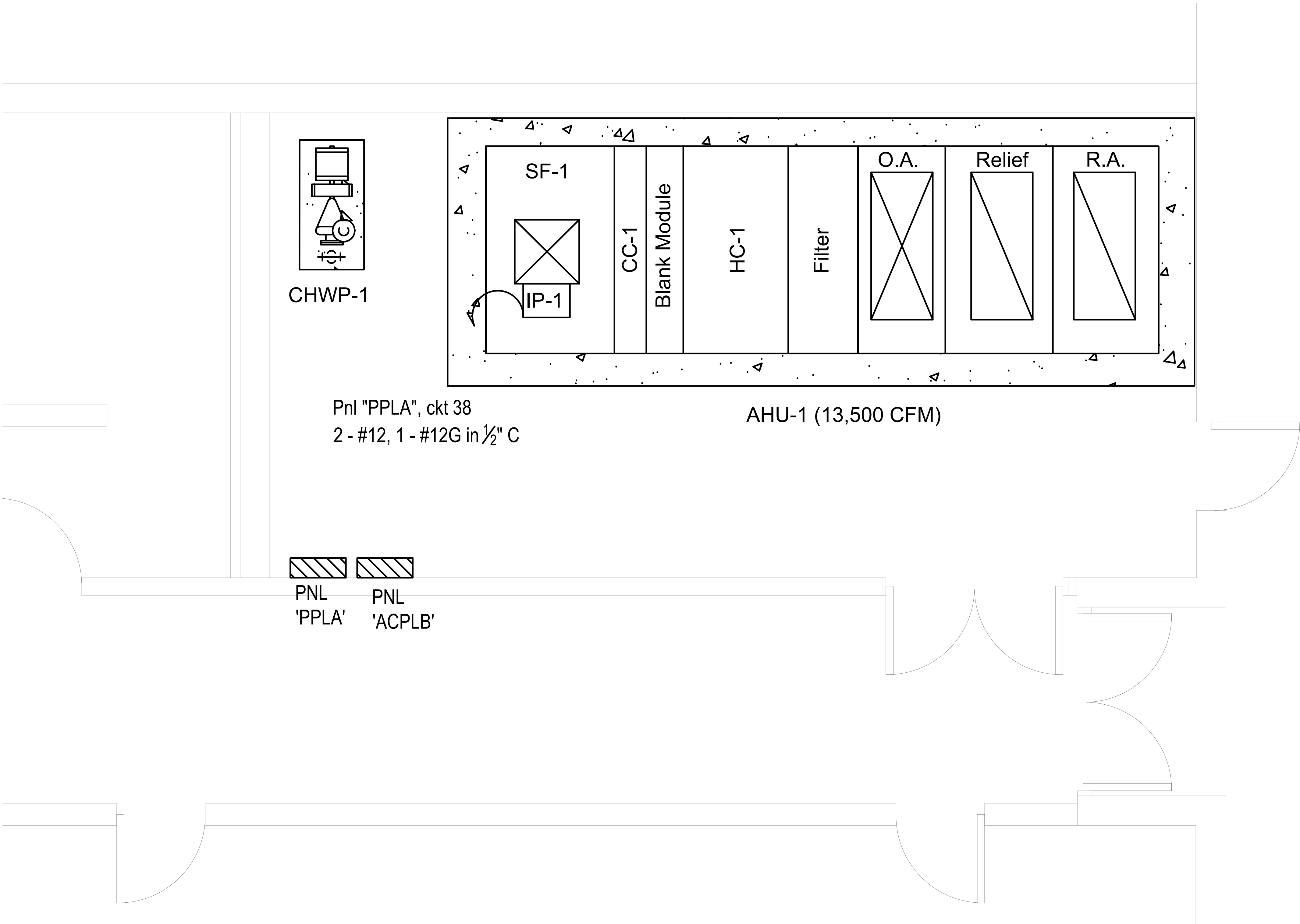
These tables are based on an evenly distributed load allowing 3% voltage drop at last outlet:

| Variable Frequency Drive Schedule |  |
|-----------------------------------|--|
|-----------------------------------|--|



Key Plan

| No. | Date |
|-----|------|
|     |      |
|     |      |
|     |      |
|     |      |
|     |      |

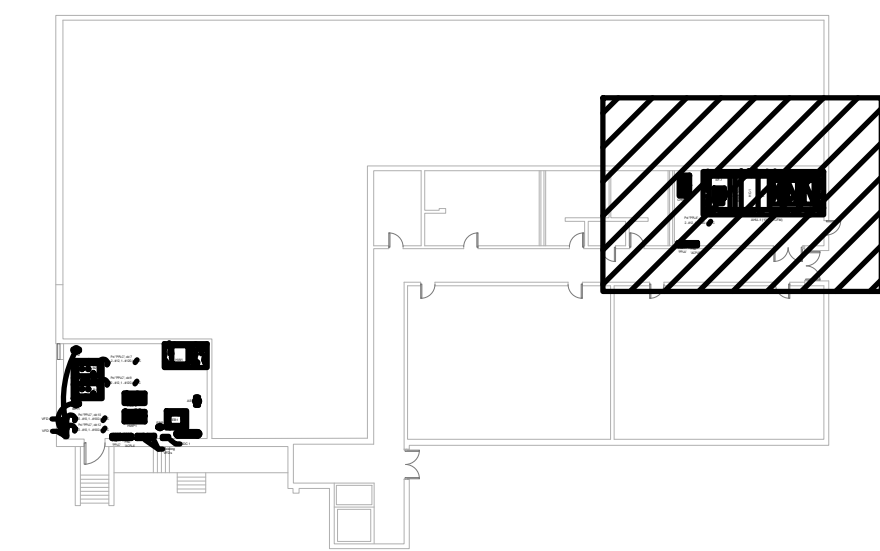


1

E1.2

Electrical Plan

Scale: 1/2" = 1' - 0"



Key Plan

AeroRaq Engineering Inc

Engineering Services

8511 Davis Parkway, Suite C6-205

Charlotte, North Carolina 28269

Firm License # C-3509

Phone Number: 704 469 8463

Note:

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07/10/26

Seal:

036300

SEAL

PROFESSIONAL ENGINEER

WILLIAM R. BAKER

Revisions

| No. | Date |
|-----|------|
|     |      |
|     |      |
|     |      |
|     |      |
|     |      |

Lena Sue Beam Boiler Addition

Gaston College

201 Hwy 321 South.

Dallas, North Carolina 28034

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Project No: 01-2026005

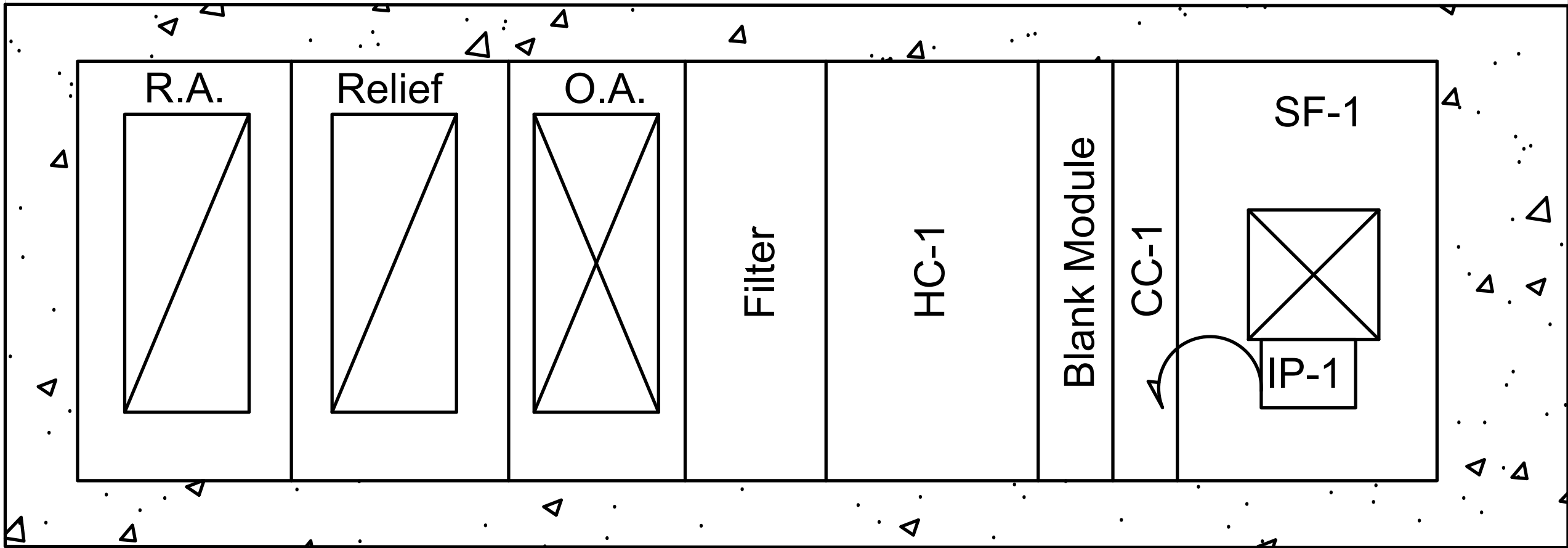
Scale: 1/2" = 1' - 0"

Date: 03-24-2026

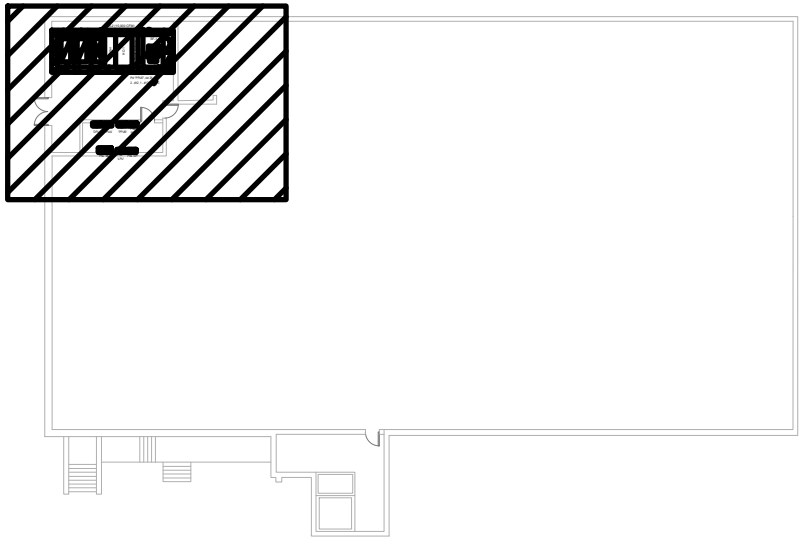
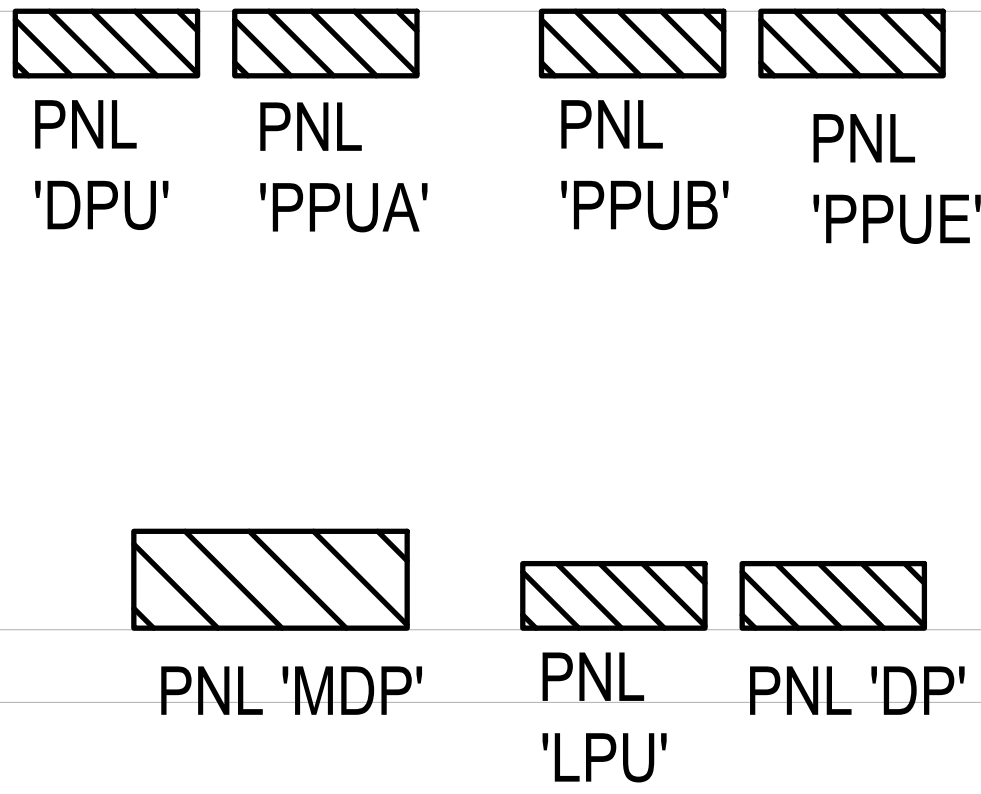
Title: Electrical Plan

E1.2

AHU-2 (15,000 CFM)



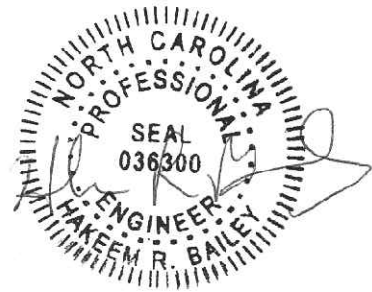
Pnl "PPUE", ckt 25  
2 - #12, 1 - #12G in ½" C



Key Plan

**AeroRaq Engineering Inc**  
*Engineering Services*  
8511 Davis Parkway, Suite C6-205  
Charlotte, North Carolina 28269  
Firm License # C-3509  
Phone Number: 704 469 8463

Note:  
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Seal:

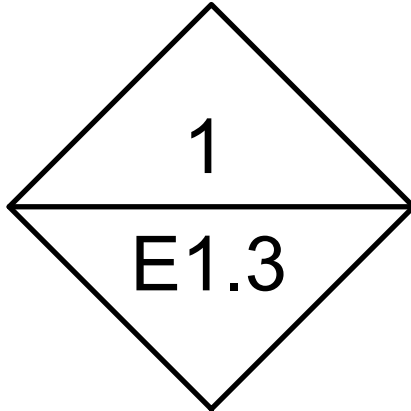
Revisions

| No. | Date |
|-----|------|
|     |      |
|     |      |
|     |      |
|     |      |
|     |      |

**Lena Sue Beam Boiler Addition**  
Gaston College  
201 Hwy 321 South.  
Dallas, North Carolina 28034

COPYRIGHT  
Project No: 01-2026005  
Scale: ¼" = 1' - 0"  
Date: 03-24-2026  
Title: Electrical Plan

**E1.3**



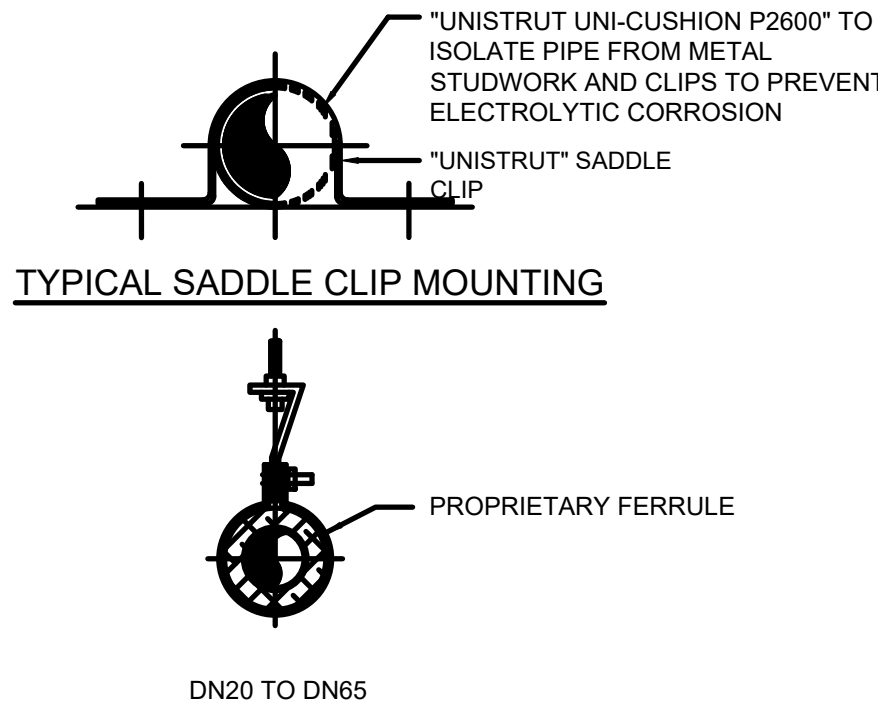
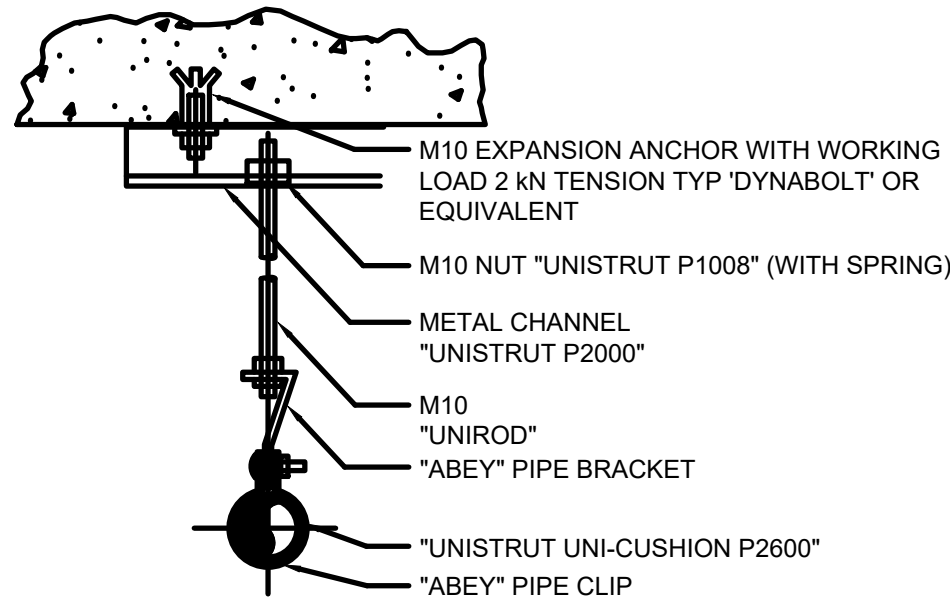
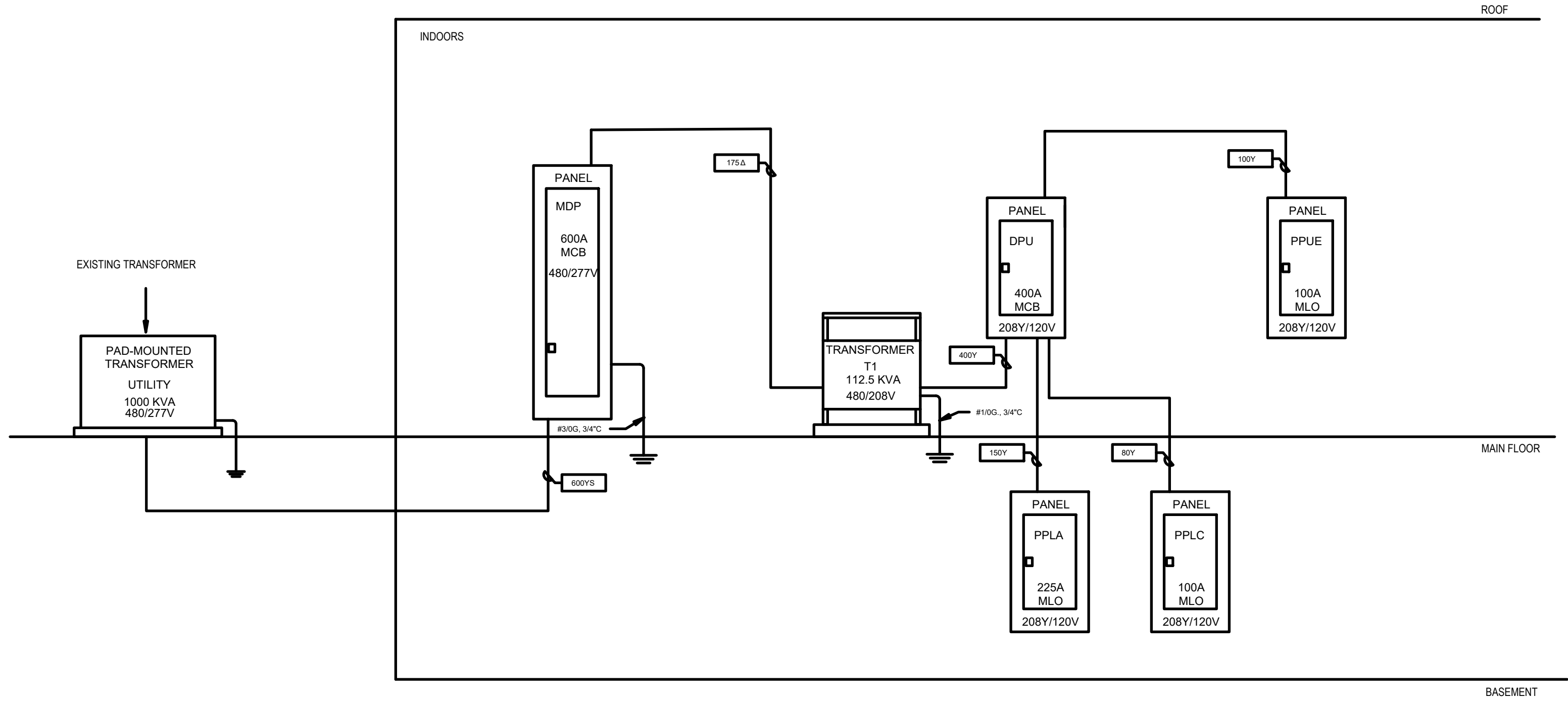
Electrical Plan

Scale: ½" = 1' - 0"

|                                                                |                    |      |           |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
|----------------------------------------------------------------|--------------------|------|-----------|----------------------|--------|------|---|----------------------------------|-----------|------------------------------------------|---------------|--|--|--|--|--|--|--|--|--|
| Panelboard: "MDP"<br>Existing - Siemens<br>Voltage: 277 /480 V |                    |      |           |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Main Bus Rating:<br>Main C/B Rating:                           |                    |      |           | 600 Amps<br>600 Amps |        |      |   | Type:<br>Location:<br>Mounting:  |           | Service<br>Main Electrical Room<br>Floor |               |  |  |  |  |  |  |  |  |  |
|                                                                |                    |      |           | Phase Load           |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Ckt                                                            | Load Served        | kVA  | Wire Size | Ckt Brk              | A      | B    | C | Ckt Brk                          | Wire Size | kVA                                      | Load Served   |  |  |  |  |  |  |  |  |  |
| 1                                                              |                    | 22.3 | ETR       | 80                   | 38.3   |      |   | 100                              | ETR       | 16                                       |               |  |  |  |  |  |  |  |  |  |
| 3                                                              | Panel "LPU"        | 14.9 | ETR       | 3                    |        | 27.9 |   | 3                                | ETR       | 13                                       | Panel "ACPLB" |  |  |  |  |  |  |  |  |  |
| 5                                                              |                    | 14.3 | ETR       | 150                  |        | 27.3 |   | 80                               | ETR       | 13                                       |               |  |  |  |  |  |  |  |  |  |
| 7                                                              | Panel "ACPLA"      | 23.6 | ETR       | 3                    | 30.8   |      |   | 3                                | ETR       | 7.2                                      |               |  |  |  |  |  |  |  |  |  |
| 9                                                              |                    | 23.6 | ETR       | 3                    |        | 30.8 |   | 3                                | ETR       | 7.2                                      | SF - 2        |  |  |  |  |  |  |  |  |  |
| 11                                                             |                    | 23.6 | ETR       | 3                    |        | 30.8 |   | 3                                | ETR       | 7.2                                      |               |  |  |  |  |  |  |  |  |  |
| 13                                                             |                    | 58   | ETR       | 175                  | 58     |      |   | 30                               | ETR       |                                          |               |  |  |  |  |  |  |  |  |  |
| 15                                                             | Panel "DPU" via TX | 59.8 | ETR       | 3                    |        | 59.8 |   | 3                                | ETR       |                                          | Spare         |  |  |  |  |  |  |  |  |  |
| 17                                                             |                    | 59.7 | ETR       | 3                    |        | 59.7 |   | 3                                | ETR       |                                          |               |  |  |  |  |  |  |  |  |  |
| 19                                                             |                    | 2.5  | ETR       | 30                   | 5.4    |      |   | 3                                | ETR       | 2.9                                      |               |  |  |  |  |  |  |  |  |  |
| 21                                                             | Elevator           | 2.5  | ETR       | 3                    |        | 5.4  |   | 3                                | ETR       | 2.9                                      | RF - 2        |  |  |  |  |  |  |  |  |  |
| 23                                                             |                    | 2.5  | ETR       | 60                   |        | 5.4  |   | 3                                | ETR       | 2.9                                      |               |  |  |  |  |  |  |  |  |  |
| 25                                                             |                    |      | ETR       | 3                    | 0      |      |   | 80                               | ETR       |                                          |               |  |  |  |  |  |  |  |  |  |
| 27                                                             | TVSS               |      | ETR       |                      | 0      |      |   |                                  | ETR       |                                          | Spare         |  |  |  |  |  |  |  |  |  |
| 29                                                             |                    |      | ETR       | 3                    |        |      |   | 3                                | ETR       |                                          |               |  |  |  |  |  |  |  |  |  |
| 31                                                             |                    |      |           |                      | 0.4    |      |   | 15                               | ETR       | 0.4                                      |               |  |  |  |  |  |  |  |  |  |
| 33                                                             |                    |      |           |                      | 0.4    |      |   | 3                                | ETR       | 0.4                                      | EF - 1        |  |  |  |  |  |  |  |  |  |
| 35                                                             |                    |      |           |                      |        | 0.4  |   | 3                                | ETR       | 0.4                                      |               |  |  |  |  |  |  |  |  |  |
| 37                                                             |                    |      |           |                      | 0.4    |      |   | 15                               | ETR       | 0.4                                      |               |  |  |  |  |  |  |  |  |  |
| 39                                                             |                    |      |           |                      |        | 0.4  |   | 3                                | ETR       | 0.4                                      | EF - 2        |  |  |  |  |  |  |  |  |  |
| 41                                                             |                    |      |           |                      |        | 0.4  |   | 3                                | ETR       | 0.4                                      |               |  |  |  |  |  |  |  |  |  |
| Phase Load (kVA)                                               |                    |      |           | 133.3 124.7 124.0    |        |      |   | NEMA Rating:                     |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Phase Load (Amps)                                              |                    |      |           | 481.2 450.2 447.7    |        |      |   | Min. Interrupt Capacity: 65k AIC |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Notes:<br>Panel is existing, Panel is fully rated              |                    |      |           |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Load Demand Tabulation                                         |                    |      |           |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Connected Load (kVA)                                           |                    |      |           | Factor               | Demand |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Lighting                                                       | 0.00               | 1.25 | 0.00      |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Receptacles                                                    | 2.90               | 1    | 2.90      |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| HVAC                                                           | 1                  | 1    | 0.00      |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Water Heating                                                  | 0.00               | 1    | 0.00      |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Motors                                                         | 0.00               | 1.25 | 0.00      |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Kitchen                                                        | 0.00               | 1    | 0.00      |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Misc.                                                          | 382.00             | 1    | 382.00    |                      |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Total Demand Load                                              |                    |      |           | 384.90               |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |
| Total Demand Amps                                              |                    |      |           | 462.96               |        |      |   |                                  |           |                                          |               |  |  |  |  |  |  |  |  |  |

|                                                                |              |      |           |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
|----------------------------------------------------------------|--------------|------|-----------|----------------------|--------|------|---|----------------------------------|-----------|-----------------------------------------|--------------|--|--|--|--|--|--|--|--|--|
| Panelboard: "DPU"<br>Existing - Siemens<br>Voltage: 120 /208 V |              |      |           |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Main Bus Rating:<br>Main C/B Rating:                           |              |      |           | 400 Amps<br>400 Amps |        |      |   | Type:<br>Location:<br>Mounting:  |           | Distribution<br>Main Electrical<br>Wall |              |  |  |  |  |  |  |  |  |  |
|                                                                |              |      |           | Phase Load           |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Ckt                                                            | Load Served  | kVA  | Wire Size | Ckt Brk              | A      | B    | C | Ckt Brk                          | Wire Size | kVA                                     | Load Served  |  |  |  |  |  |  |  |  |  |
| 1                                                              |              | 4.8  | ETR       | 80                   | 14.7   |      |   | 100                              | ETR       | 9.9                                     |              |  |  |  |  |  |  |  |  |  |
| 3                                                              | Panel "LABA" | 3.9  | ETR       | 3                    |        | 15   |   | 3                                | ETR       | 11.1                                    | Panel "PPUA" |  |  |  |  |  |  |  |  |  |
| 5                                                              |              | 3    | ETR       | 80                   |        | 14.2 |   | 3                                | ETR       | 11.2                                    |              |  |  |  |  |  |  |  |  |  |
| 7                                                              |              | 5.3  | ETR       | 3                    | 16.3   |      |   | 100                              | ETR       | 11                                      |              |  |  |  |  |  |  |  |  |  |
| 9                                                              | Panel "LABB" | 4.4  | ETR       | 3                    |        | 15.9 |   | 3                                | ETR       | 11.5                                    | Panel "PPUB" |  |  |  |  |  |  |  |  |  |
| 11                                                             |              | 4.5  | ETR       | 80                   |        | 16.9 |   | 3                                | ETR       | 12.4                                    |              |  |  |  |  |  |  |  |  |  |
| 13                                                             |              | 11.6 | ETR       | 150                  | 20.7   |      |   | 100                              | ETR       | 9.1                                     |              |  |  |  |  |  |  |  |  |  |
| 15                                                             | Panel "PPLA" | 12.4 | ETR       | 3                    |        | 19.7 |   | 3                                | ETR       | 7.3                                     | Panel "PPUC" |  |  |  |  |  |  |  |  |  |
| 17                                                             |              | 10.1 | ETR       | 3                    |        | 20   |   | 3                                | ETR       | 9.9                                     |              |  |  |  |  |  |  |  |  |  |
| 19                                                             |              |      |           |                      | 3.3    |      |   | 100                              | ETR       | 3.3                                     |              |  |  |  |  |  |  |  |  |  |
| 21                                                             |              |      |           |                      |        | 4.7  |   | 3                                | ETR       | 4.7                                     | Panel "PPUD" |  |  |  |  |  |  |  |  |  |
| 23                                                             |              |      |           |                      |        | 4    |   | 3                                | ETR       | 4                                       |              |  |  |  |  |  |  |  |  |  |
| 25                                                             |              |      |           |                      | 2.1    |      |   | 100                              | ETR       | 2.1                                     |              |  |  |  |  |  |  |  |  |  |
| 27                                                             | TVSS         |      | ETR       | 60                   |        | 3.9  |   |                                  | ETR       | 3.9                                     | Panel "PPUE" |  |  |  |  |  |  |  |  |  |
| 29                                                             |              |      | ETR       | 3                    |        | 3.6  |   | 3                                | ETR       | 3.6                                     |              |  |  |  |  |  |  |  |  |  |
| 31                                                             |              |      |           |                      | 2.5    |      |   | 80                               | ETR       | 2.5                                     |              |  |  |  |  |  |  |  |  |  |
| 33                                                             |              |      |           |                      |        | 3.4  |   | 3                                | ETR       | 3.4                                     | Panel "PPLC" |  |  |  |  |  |  |  |  |  |
| 35                                                             |              |      |           |                      |        | 2.9  |   | 3                                | ETR       | 2.9                                     |              |  |  |  |  |  |  |  |  |  |
| 37                                                             |              |      |           |                      | 0      |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| 39                                                             |              |      |           |                      | 0      |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| 41                                                             |              |      |           |                      | 0      |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Phase Load (kVA)                                               |              |      |           | 59.6 62.6 61.6       |        |      |   | NEMA Rating:                     |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Phase Load (Amps)                                              |              |      |           | 496.7 521.7 513.3    |        |      |   | Min. Interrupt Capacity: 10k AIC |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Notes:<br>Panel is existing                                    |              |      |           |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Load Demand Tabulation                                         |              |      |           |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Connected Load (kVA)                                           |              |      |           | Factor               | Demand |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Lighting                                                       |              | 1.25 | 0.00      |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Receptacles                                                    | 1            | 1    | 0.00      |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| HVAC                                                           | 1            | 1    | 0.00      |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Water Heating                                                  | 1            | 1    | 0.00      |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Motors                                                         | 1.25         | 1.25 | 0.00      |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Kitchen                                                        | 1            | 1    | 0.00      |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Misc.                                                          | 183.80       | 1    | 183.80    |                      |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Total Demand Load                                              |              |      |           | 136.98               |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |
| Total Demand Amps                                              |              |      |           | 380.22               |        |      |   |                                  |           |                                         |              |  |  |  |  |  |  |  |  |  |

|                                                                 |  |  |  |                      |  |  |  |  |  |  |  |
|-----------------------------------------------------------------|--|--|--|----------------------|--|--|--|--|--|--|--|
| Panelboard: "PPUE"<br>Existing - Siemens<br>Voltage: 120 /208 V |  |  |  |                      |  |  |  |  |  |  |  |
| Main Bus Rating:<br>MLO Rating:                                 |  |  |  | 100 Amps<br>100 Amps |  |  |  |  |  |  |  |



NOTE  
1. PROPRIETARY FERRULE NOT REQUIRED FOR PRE-INSULATED PIPING. FOR DN15 PIPES USE ABEY NOOSE HANGING CLIP.

1  
E3.2

## Partial Electrical Riser

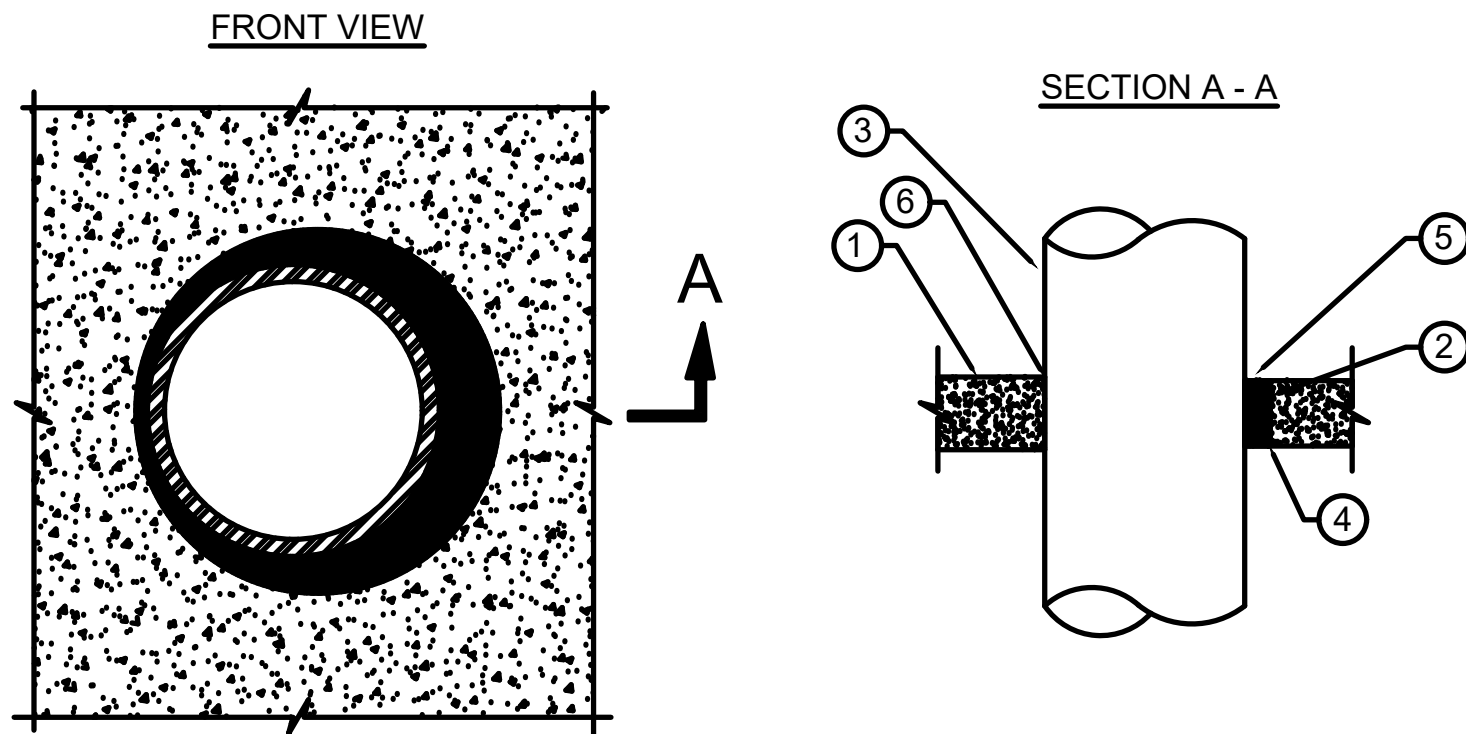
Scale: N/A

2  
E3.2

## Conduit support details

Scale: N/A

UL/cUL SYSTEM No. CAJ1226  
METAL PIPE THROUGH A SLEEVE IN CONCRETE FLOOR/WALL OR BLOCK WALL  
F RATING = 3-HR  
T RATING = 0-HR  
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.  
L RATING AT 400° F = 4 CFM/SQ. FT.



- CONCRETE FLOOR OR BLOCK ASSEMBLY(3-HR FIRE RATING):
  - LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MIN. 4-1/2" THICK.)
  - ANY UL/ULC CLASSIFIED CONCRETE BLOCK WALL
- OPTIONAL: MAXIMUM 32" NOMINAL DIAMETER STEEL PIPE SLEEVE (SCH. 40 OR HEAVIER)
- PENETRATING ITEM TO BE ONE THE THE FOLLOWING:
  - MAX. 30" NOMINAL DIAMETER STEEL PIPE (SCH. 10 OR HEAVIER).
  - MAX. 30" NOMINAL DIAMETER CAST IRON PIPE.
  - MAX. 6" NOMINAL DIAMETER COPPER PIPE.
  - MAX. 6" NOMINAL DIAMETER STEEL CONDUIT.
  - MAX. 4" NOMINAL DIAMETER EMT.
- MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
- MINIMUM 1/2" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT
- MINIMUM 1/2" CROWN HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES:  
1. MAXIMUM DIAMETER OF OPENING = 32"  
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1 - 1/2"  
3. MINIMUM 1/2" DEPTH HILTI FS- ONE INTUMESCENT FIRESTOP SEALANT IS REQUIRED ON BOTH SIDE OF A WALL ASSEMBLY.

| FEEDER SCHEDULE                  |                                                                              |                                   |
|----------------------------------|------------------------------------------------------------------------------|-----------------------------------|
| FEEDERS BASED ON 60C COPPER WIRE | FEEDERS BASED ON 75C COPPER WIRE IN EMT TYPE CONDUIT WITH COPPER GROUND WIRE | TRANSFORMER SECONDARY             |
| 150A 3#12, #12G; 3/4"C           | 150A 3#12, #12G; 3/4"C                                                       | 150V 4#12, #12G; 3/4"C            |
| 200A 3#12, #12G; 3/4"C           | 200A 3#12, #12G; 3/4"C                                                       | 200V 4#12, #12G; 3/4"C            |
| 250A 3#10, #10G; 3/4"C           | 250A 3#10, #10G; 3/4"C                                                       | 250V 4#10, #10G; 3/4"C            |
| 300A 3#10, #10G; 3/4"C           | 300A 3#10, #10G; 3/4"C                                                       | 300V 4#10, #10G; 3/4"C            |
| 350A 3#8, #10G; 3/4"C            | 350A 3#8, #10G; 3/4"C                                                        | 350V 4#8, #10G; 3/4"C             |
| 400A 3#8, #10G; 3/4"C            | 400A 3#8, #10G; 3/4"C                                                        | 400V 4#8, #10G; 3/4"C             |
| 450A 3#8, #10G; 3/4"C            | 450A 3#8, #10G; 3/4"C                                                        | 450V 4#8, #10G; 3/4"C             |
| 500A 3#6, #10G; 3/4"C            | 500A 3#6, #10G; 3/4"C                                                        | 500V 4#6, #10G; 1C                |
| 550A 3#6, #10G; 3/4"C            | 550A 3#6, #10G; 3/4"C                                                        | 550V 4#4, #8G; 1-1/4"C            |
| 600A 3#4, #8G; 1"C               | 600A 3#4, #8G; 1"C                                                           | 600V 4#4, #8G; 1-1/4"C            |
| 650A 3#3, #8G; 1-1/4"C           | 650A 3#4, #8G; 1"C                                                           | 650V 4#3, #8G; 1-1/4"C            |
| 700A 3#2, #8G; 1-1/4"C           | 700A 3#3, #8G; 1-1/4"C                                                       | 700V 4#3, #8G; 1-1/4"C            |
| 750A 3#1, #8G; 1-1/4"C           | 750A 3#2, #8G; 1-1/4"C                                                       | 750V 4#2, #6G; 1-1/2"C            |
|                                  | 800A 3#1, #8G; 1-1/2"C                                                       | 800V 4#1, #6G; 1-1/2"C            |
|                                  | 850A 3#1/0, #6G; 1-1/2"C                                                     | 850V 4#1/0, #6G; 2"C              |
|                                  | 900A 3#2/0, #6G; 2"C                                                         | 900V 4#2/0, #6G; 2"C              |
|                                  | 950A 3#3/0, #6G; 2"C                                                         | 950V 4#3/0, #6G; 2"C              |
|                                  | 1000A 3#4/0, #4G; 2"C                                                        | 1000V 4#4/0, #4G; 2-1/2"C         |
|                                  | 1050A 3-250KCMIL, #4G; 2-1/2"C                                               | 1050V 4-250KCMIL, #4G; 2-1/2"C    |
|                                  | 1100A 3-350KCMIL, #4G; 2-1/2"C                                               | 1100V 4-350KCMIL, #4G; 3"C        |
|                                  | 1150A 3-500KCMIL, #3G; 3"C                                                   | 1150V 4-500KCMIL, #3G; 3-1/2"C    |
|                                  | 1200A 2(3#3/0, #3G; 2"C)                                                     | 1200V 2(4#3/0, #3G; 2"C)          |
|                                  | 1250A 2(3#4/0, #2G; 2"C)                                                     | 1250V 2(4#4/0, #2G; 2-1/2"C)      |
|                                  | 1300A 2(3-250KCMIL, #2G; 2-1/2"C)                                            | 1300V 2(4-250KCMIL, #2G; 2-1/2"C) |
|                                  | 1350A 2(3-350KCMIL, #1G; 2-1/2"C)                                            | 1350V 2(4-350KCMIL, #1G; 3"C)     |
|                                  | 1400A 2(3-500KCMIL, #1/0G; 3"C)                                              | 1400V 2(4-500KCMIL, #1/0G; 3"C)   |
|                                  | 1450A 3(3-300KCMIL, #1/0G; 2-1/2"C)                                          | 1450V 3(4-300KCMIL, #1/0G; 3"C)   |
|                                  | 1500A 3(3-350KCMIL, #2/0G; 2-1/2"C)                                          | 1500V 3(4-350KCMIL, #2/0G; 3"C)   |
|                                  | 1550A 3(3-400KCMIL, #2/0G; 3"C)                                              | 1550V 3(4-400KCMIL, #2/0G; 3"C)   |
|                                  | 1600A 4(3-350KCMIL, #3/0G; 3"C)                                              | 1600V 4(4-350KCMIL, #3/0G; 3"C)   |

| FEEDER SCHEDULE                  |                                                                              |                                   |
|----------------------------------|------------------------------------------------------------------------------|-----------------------------------|
| FEEDERS BASED ON 60C COPPER WIRE | FEEDERS BASED ON 75C COPPER WIRE IN EMT TYPE CONDUIT WITH COPPER GROUND WIRE | TRANSFORMER SECONDARY             |
| 150A 3#12, #12G; 3/4"C           | 150A 3#12, #12G; 3/4"C                                                       | 150V 4#12, #12G; 3/4"C            |
| 200A 3#12, #12G; 3/4"C           | 200A 3#12, #12G; 3/4"C                                                       | 200V 4#12, #12G; 3/4"C            |
| 250A 3#10, #10G; 3/4"C           | 250A 3#10, #10G; 3/4"C                                                       | 250V 4#10, #10G; 3/4"C            |
| 300A 3#10, #10G; 3/4"C           | 300A 3#10, #10G; 3/4"C                                                       | 300V 4#10, #10G; 3/4"C            |
| 350A 3#8, #10G; 3/4"C            | 350A 3#8, #10G; 3/4"C                                                        | 350V 4#8, #10G; 3/4"C             |
| 400A 3#8, #10G; 3/4"C            | 400A 3#8, #10G; 3/4"C                                                        | 400V 4#8, #10G; 3/4"C             |
| 450A 3#8, #10G; 3/4"C            | 450A 3#8, #10G; 3/4"C                                                        | 450V 4#8, #10G; 3/4"C             |
| 500A 3#6, #10G; 3/4"C            | 500A 3#6, #10G; 3/4"C                                                        | 500V 4#6, #10G; 1C                |
| 550A 3#6, #10G; 3/4"C            | 550A 3#6, #10G; 3/4"C                                                        | 550V 4#4, #8G; 1-1/4"C            |
| 600A 3#4, #8G; 1"C               | 600A 3#4, #8G; 1"C                                                           | 600V 4#4, #8G; 1-1/4"C            |
| 650A 3#3, #8G; 1-1/4"C           | 650A 3#4, #8G; 1"C                                                           | 650V 4#3, #8G; 1-1/4"C            |
| 700A 3#2, #8G; 1-1/4"C           | 700A 3#3, #8G; 1-1/4"C                                                       | 700V 4#3, #8G; 1-1/4"C            |
| 750A 3#1, #8G; 1-1/4"C           | 750A 3#2, #8G; 1-1/4"C                                                       | 750V 4#2, #6G; 1-1/2"C            |
|                                  | 800A 3#1, #8G; 1-1/2"C                                                       | 800V 4#1, #6G; 1-1/2"C            |
|                                  | 850A 3#1/0, #6G; 1-1/2"C                                                     | 850V 4#1/0, #6G; 2"C              |
|                                  | 900A 3#2/0, #6G; 2"C                                                         | 900V 4#2/0, #6G; 2"C              |
|                                  | 950A 3#3/0, #6G; 2"C                                                         | 950V 4#3/0, #6G; 2"C              |
|                                  | 1000A 3#4/0, #4G; 2"C                                                        | 1000V 4#4/0, #4G; 2-1/2"C         |
|                                  | 1050A 3-250KCMIL, #4G; 2-1/2"C                                               | 1050V 4-250KCMIL, #4G; 2-1/2"C    |
|                                  | 1100A 3-350KCMIL, #4G; 2-1/2"C                                               | 1100V 4-350KCMIL, #4G; 3"C        |
|                                  | 1150A 3-500KCMIL, #3G; 3"C                                                   | 1150V 4-500KCMIL, #3G; 3-1/2"C    |
|                                  | 1200A 2(3#3/0, #3G; 2"C)                                                     | 1200V 2(4#3/0, #3G; 2"C)          |
|                                  | 1250A 2(3#4/0, #2G; 2"C)                                                     | 1250V 2(4#4/0, #2G; 2-1/2"C)      |
|                                  | 1300A 2(3-250KCMIL, #2G; 2-1/2"C)                                            | 1300V 2(4-250KCMIL, #2G; 2-1/2"C) |
|                                  | 1350A 2(3-350KCMIL, #1G; 2-1/2"C)                                            | 1350V 2(4-350KCMIL, #1G; 3"C)     |
|                                  | 1400A 2(3-500KCMIL, #1/0G; 3"C)                                              | 1400V 2(4-500KCMIL, #1/0G; 3"C)   |
|                                  | 1450A 3(3-300KCMIL, #1/0G; 2-1/2"C)                                          | 1450V 3(4-300KCMIL, #1/0G; 3"C)   |
|                                  | 1500A 3(3-350KCMIL, #2/0G; 2-1/2"C)                                          | 1500V 3(4-350KCMIL, #2/0G; 3"C)   |
|                                  | 1550A 3(3-400KCMIL, #2/0G; 3"C)                                              | 1550V 3(4-400KCMIL, #2/0G; 3"C)   |
|                                  | 1600A 4(3-350KCMIL, #3/0G; 3"C)                                              | 1600V 4(4-350KCMIL, #3/0G; 3"C)   |

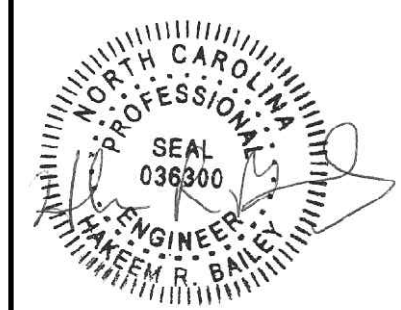
3  
E3.2

## Rated Wall Penetration

Scale: N/A

**AeroRaq Engineering Inc**  
Engineering Services  
8511 Davis Parkway, Suite C6-205  
Charlotte, North Carolina 28269  
Firm License # C-3509  
Phone Number: 704 469 8463

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Seal: 07/10/26

### Revisions

| No. | Date |
|-----|------|
|     |      |
|     |      |
|     |      |
|     |      |
|     |      |
|     |      |

**Lena Sue Beam Boiler Addition**  
Gaston College  
201 Hwy 321 South.  
Dallas, North Carolina 28034

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Project No:  
01-2026005

Scale: N/A

Date: 03-24-2026

Title: Electrical Riser

E3.2