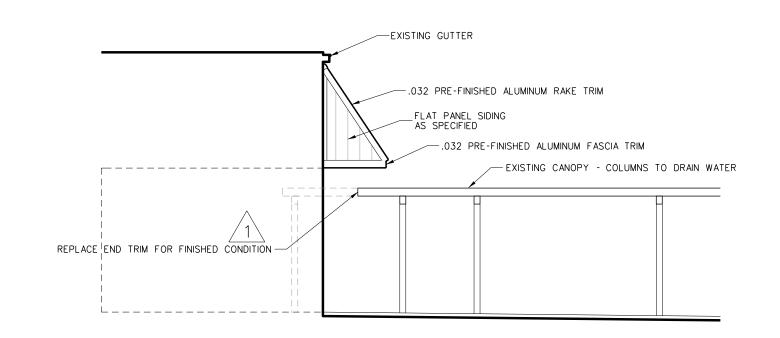
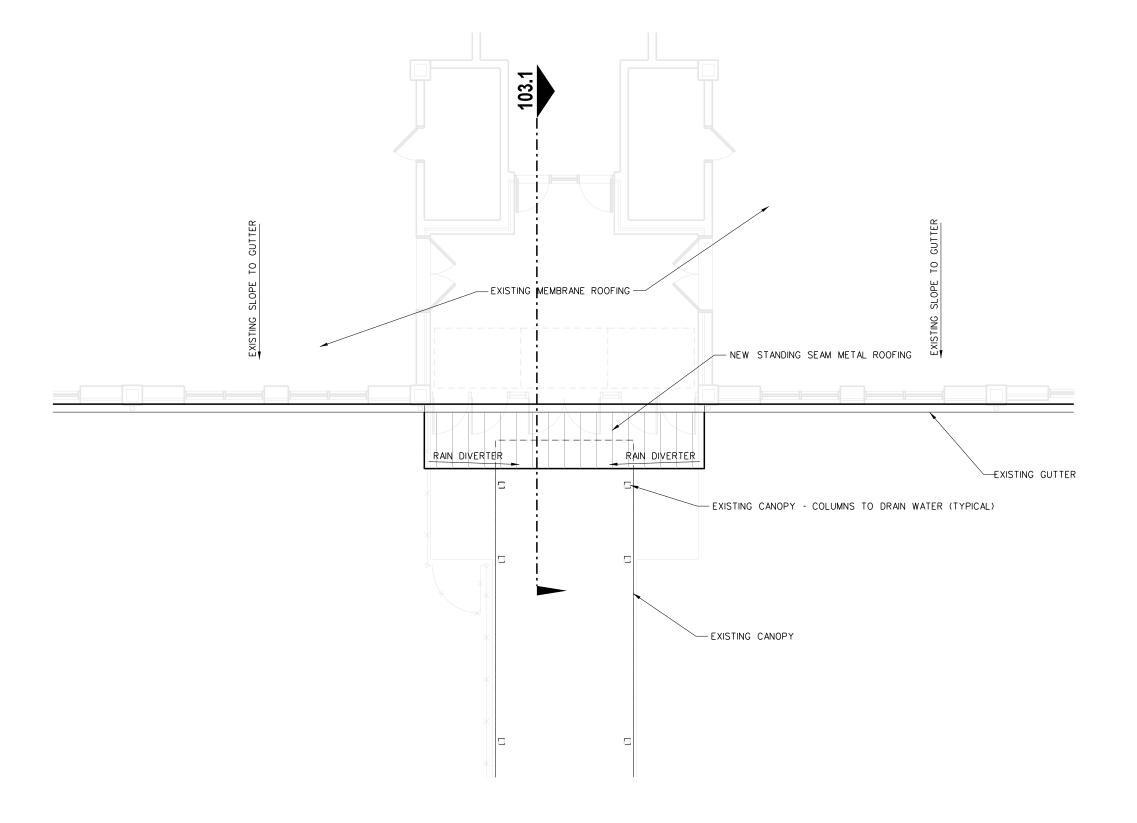
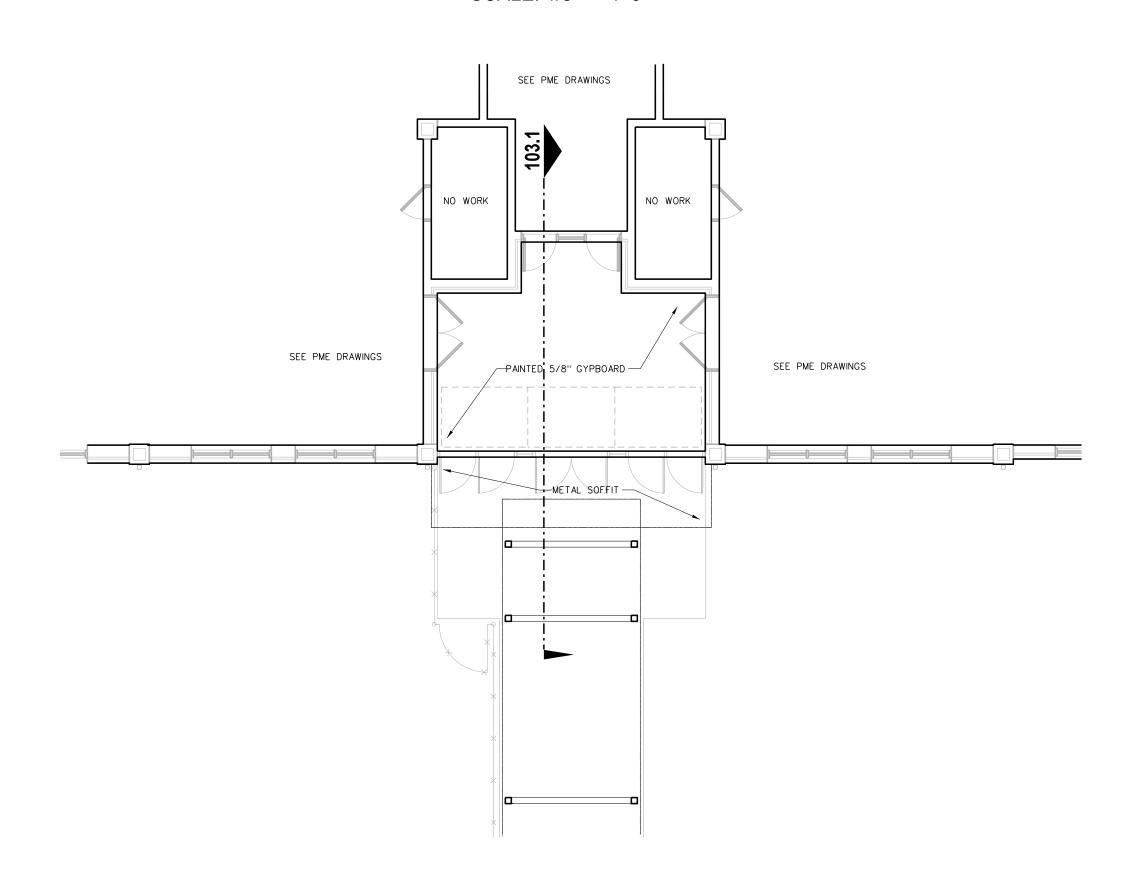
101.4 PARTIAL EAST ELEVATION SCALE: 1/8" = 1'-0"



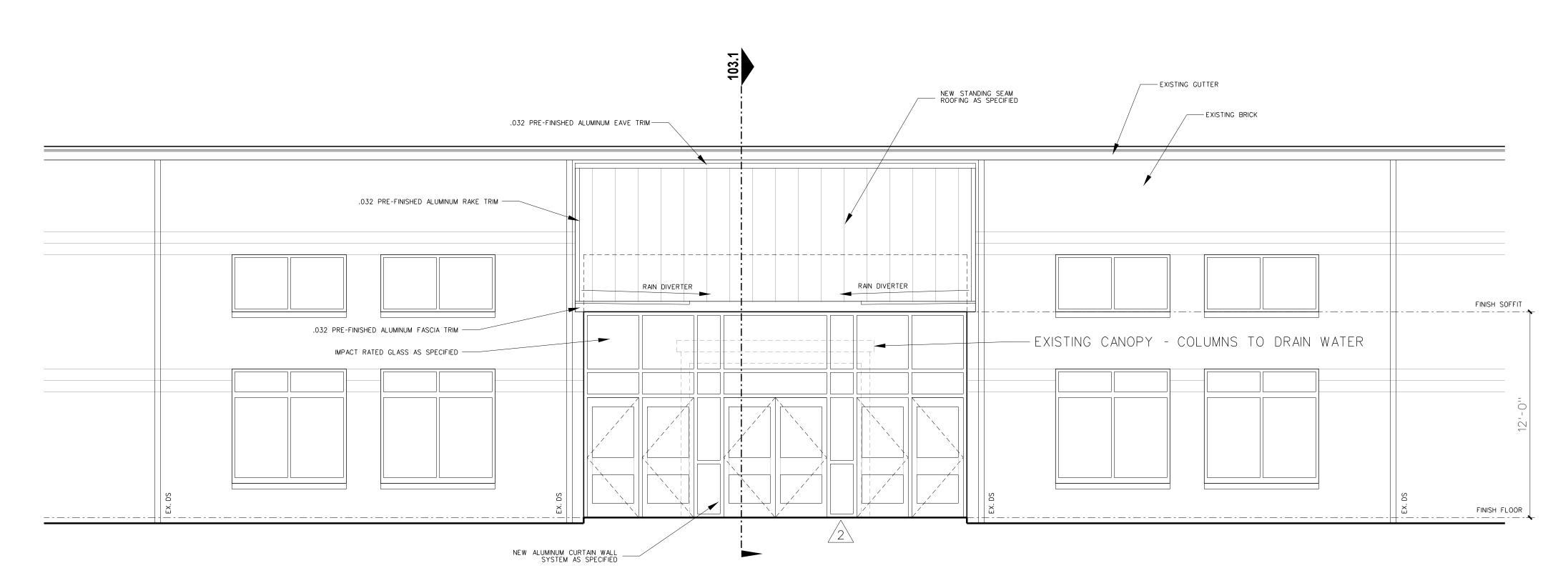
101.6 PARTIAL WEST ELEVATION



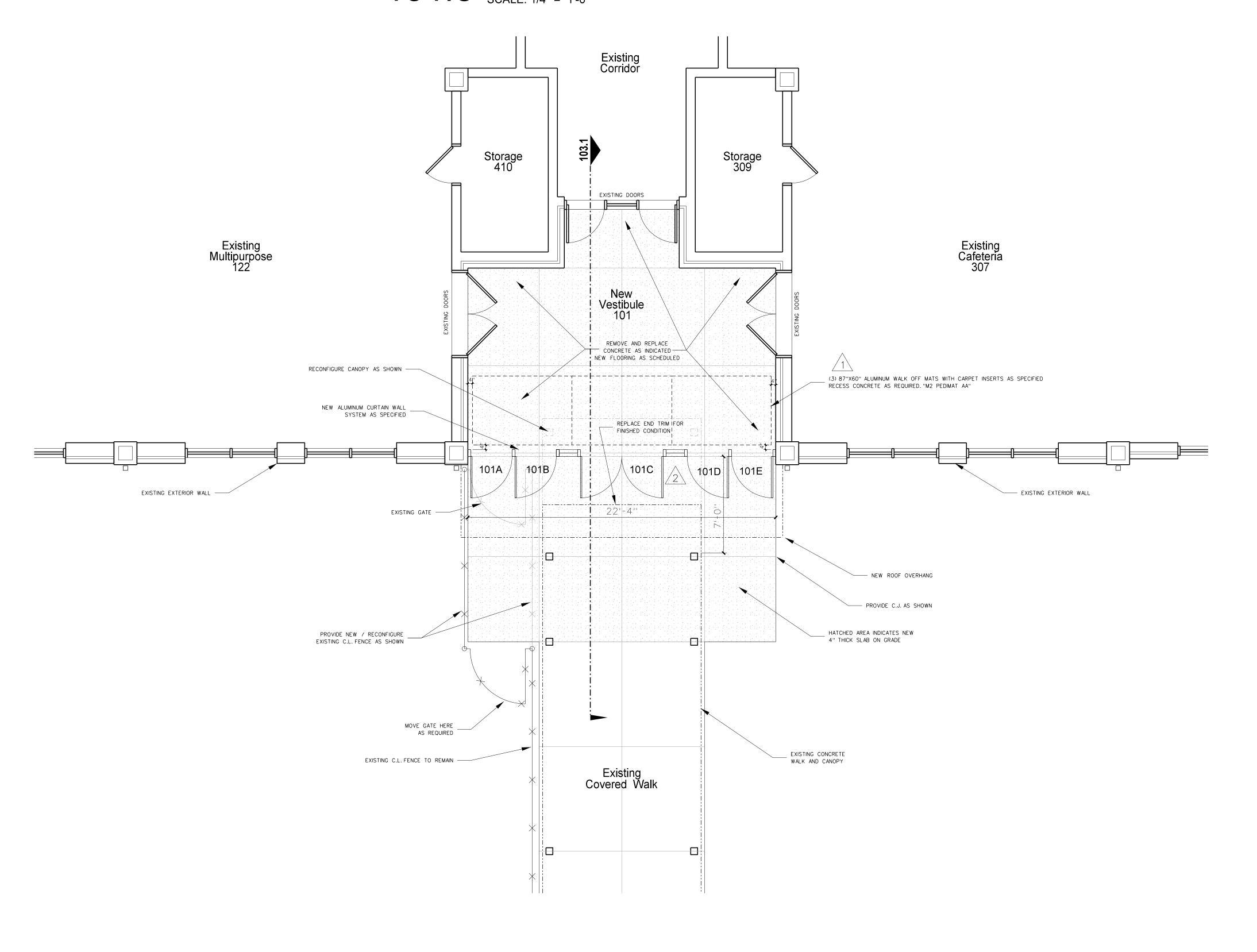
101.3 PARTIAL ROOF PLAN SCALE: 1/8" = 1'-0"



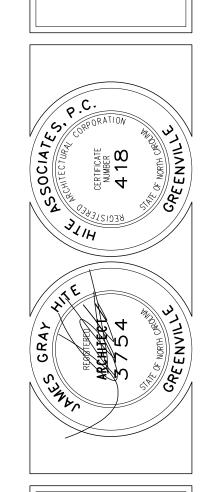
101.2 PARTIAL REFLECTED CEILING PLAN SCALE: 1/8" = 1'-0"



101.5 PARTIAL SOUTH ELEVATION



101.1 PARTIAL FLOOR PLAN SCALE: 1/4" = 1'-0"



Bog

. REFERENCE THE FULL AND COMPLETE SET OF DRAWINGS, AND SPECIFICATIONS PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF WORK WITH OTHER CONTRACTORS ON SITE. CONTRACTOR SHALL VISIT SITE AND WALK THROUGH THE PROJECT SCOPE OF WORK AREA PRIOR TO SUBMITTING BID.

2. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE NC BUILDING CODE & CONTR. SHALL NOTIFY ENGINEER IN WRITING REGARDING ANY CODE DISCREPANCIES FOUND ON PLANS. CONTR. IS RESPONSIBLE FOR PERMITS, INSPECTIONS AND FEES. THE CONTROLS CONTRACTOR (C.C.) SHALL PROVIDE ALL CONTROL VALVES, ACTUATORS, DAMPERS, FAN COIL COMBINATION STARTERS. C.C. SHALL PROVIDE ALL LOAD SIDE WIRING ASSOCIATED WITH ALL FAN COIL COMBINATION STARTERS. VALVE TAGS AND LABELING SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR (M.C.).

3. DO NOT SCALE THESE DRAWINGS; REFER TO LARGEST SCALE ARCHITECTURAL DRAWINGS. THESE DRAWINGS ARE DIAGRAMMATIC ONLY & ARE NOT INTENDED TO SHOW MINOR DETAILS & EXACT LOCATIONS. DESIGN ADJUSTMENTS SHALL BE ANTICIPATED BY THE CONTRACTORS TO PROVIDE A COMPLETE AND OPERATIONAL

4. "PROVIDE" IS DEFINED AS FURNISH & INSTALL AS PER MANUFACTURERS RECOMMENDATIONS.

5. THE MECHANICAL & CONTROLS CONTRACTOR SHALL COORDINATE THE INSTALLATION OF HVAC EQUIPMENT & CONTROLS WITH EXISTING CONDITIONS, FIELD VERIFY PRIOR TO INSTALLATION TO AVOID CONFLICT. CONTACT ENGINEER IF ALTERNATE INSTALLATION METHOD IS REQUIRED.

6. SYSTEMS INDICATED ON PLANS ARE DIAGRAMMATIC IN NATURE. CONTRACTOR SHALL EXAMINE SITE CONDITIONS PRIOR TO DUCT CONSTRUCTION AND COORDINATE INSTALLATION WITH OTHER TRADES. CONTRACTOR SHALL PROVIDE NECESSARY HANGERS, FASTENERS ETC. TO PROVIDE A COMPLETE AND WORKING SYSTEM.

7. CONTRACTOR SHALL SEAL ALL DUCTWORK WITH A PAINT ON MASTIC. ALL WALL PENETRATIONS SHALL BE SEALED AIR TIGHT.

9. CONTRACTOR SHALL INSTALL BALANCING DAMPERS IN EACH MAIN RETURN AND VENTILATION AIR DUCT TO PROVIDE PROPER AIRFLOW BALANCE TO EACH UNIT.

10. LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 4'-0" A.F.F. (CENTER OF BOX FOR GYP BRD, TOP OF BOX FOR MASONRY) IN LOCATIONS INDICATED ON PLANS.

11. ALL DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.

12. CONTRACTOR SHALL COORDINATE ALL WALL, ROOF AND FLOOR PENETRATION LOCATIONS AND SIZES. SEAL ALL OPENINGS. MAINTAIN WALL RATINGS WHEN PENETRATING FIRE OR SMOKE RATED WALLS.

13. FABRICATE AND INSTALL ALL DUCT WORK PER SMACNA 1.5" W.C. PRESSURE. ALL ELBOWS SHALL HAVE 1.5R CENTERLINE. ALL DUCT UNDER SLAB SHALL BE FIBERGLASS.

16. ALL SUPPLY AND RETURN DUCT SHALL BE INSULATED WITH A MINIMUM OF 2-3/16" 3/4 LB. OR 2" OF 1.0 LB. DENSITY FIBERGLASS WRAP. INSULATED DOUBLE WALLED SPIRAL DUCT SHALL HAVE A MINIMUM INSULATION THICKNESS OF 2" OF 1.5 LB. DENSITY. PIPING INSULATION (REFRIGERANT OR WATER) SHALL BE A MINIMUM OF 1-1/2" THICK OR PER LATEST NC ENERGY CODE, WHICHEVER IS GREATER.

18. CABLE TRAY HAS RIGHT-OF-WAY OVER DUCTWORK; SEE ELECTRICAL DRAWINGS FOR LOCATION.

20. PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN CONNECTIONS TO HVAC UNITS.

21. PROVIDE AUXILIARY CONDENSATE DRAIN PAN FOR ALL AIR HANDLING UNITS, FAN COIL UNITS, FURNACE WITH COOLING COIL, ETC. CONTRACTOR SHALL PROVIDE AND INSTALL WATER LEVEL FLOAT SWITCH IN AUXILIARY DRAIN PAN. FLOAT SWITCH SHALL SHUT DOWN INDOOR AND ASSOCIATED OUTDOOR UNIT WHEN ACTIVATED.

22. CONDENSATE PIPE SHALL BE SCHEDULE 40 PVC OR HARD DRAWN COPPER, INSTALL WITH PROPER SLOPE AND NO SAGS. CONDENSATE PIPE SHALL BE INSULATED WITH 1/2" THICK CLOSED CELL INSULATION.

23. ALL DUCTWORK AND PIPING SHALL BE CONCEALED ABOVE CEILINGS, TRUSSES AND SOFFITS EXCEPT IN MECHANICAL ROOMS, UTILITY PLATFORMS, AREAS WITH EXPOSED STRUCTURE (NO CEILINGS), AND WHERE NOTED OTHERWISE.

24. CONTROLS CONTRACTOR IS RESPONSIBLE FOR ALL CONTROLLERS, CONTACTORS, PROGRAMMING, CONTROL WIRING, CONDUIT AND CONNECTIONS TO MECHANICAL EQUIPMENT AS REQUIRED TO MEET THE SEQUENCES OF OPERATION FOR ALL NEW AND EXISTING EQUIPMENT BEING CONTROLLED BY THE BMS.

25. MECHANICAL CONTRACTOR MAY REUSE EXISTING UNIT DISCONNECT SWITCHES WHERE THEY ARE IN GOOD WORKING ORDER AND THE CORRECT SIZE FOR THE UNIT. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL NEW DISCONNECTS THAT MAY BE REQUIRED FOR EQUIPMENT PROVIDED UNDER THIS CONTRACT. MECHANICAL CONTRACTOR SHALL FURNISH ALL REQUIRED FUSES FOR ALL FUSED DISCONNECT SWITCHES. COORDINATE DISCONNECT AND FUSE INSTALLATION WITH ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING DISCONNECT SWITCHES AND FUSES. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL LINE SIDE WIRING AND CONDUIT TO EXTERNALLY OR INTERNALLY MOUNTED DISCONNECTS AND SHALL PROVIDE AND INSTALL LOAD SIDE WIRING AND CONDUIT FROM EXTERNALLY MOUNTED DISCONNECT SWITCHES TO MECHANICAL EQUIPMENT. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FINAL ELECTRICAL CONNECTIONS TO EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR. SEE "MECHANICAL EQUIPMENT ELECTRICAL CONNECTION DETAIL".

26. ALL EXPOSED GAS PIPE IN BOILER ROOM (NEW AND EXISTING) SHALL BE PAINTED OSHA YELLOW. ALL GAS PIPING SHALL BE LABELED WITH THE TYPE OF GAS AND SUPPLY PRESSURE. GAS PIPING CONCEALED IN WALL CAVITY SHALL NOT BE REQUIRED TO BE PAINTED YELLOW. CONTRACTOR SHALL INSTALL NEW GAS PIPE PER INSTALLATION STANDARD MSS SP-58. M.C. SHALL PROVIDE MAPA PRODUCTS PIPE SUPPORTS WITH E-6000 ADHESIVE OR APPROVED EQUALS.

28. MECHANICAL CONTRACTOR SHALL PROVIDE ENGR. WITH AN INDEPENDENT AIR AND WATER BALANCE REPORT. REPORT SHALL INDICATE INITIAL AND FINAL READINGS OF UNIT SUPPLY, RETURN AND VENT AIR CFM, AS WELL AS GPM PER UNIT, AND PER PUMP. INCLUDE IN DOCUMENTS PROVIDED TO OWNER AT JOB CLOSEOUT.

29. MECHANICAL CONTRACTOR SHALL LABEL ALL EQUIPMENT WITH ENGRAVED PLASTIC LAMINATE, SCREWED TO PIECE OF EQUIPMENT.

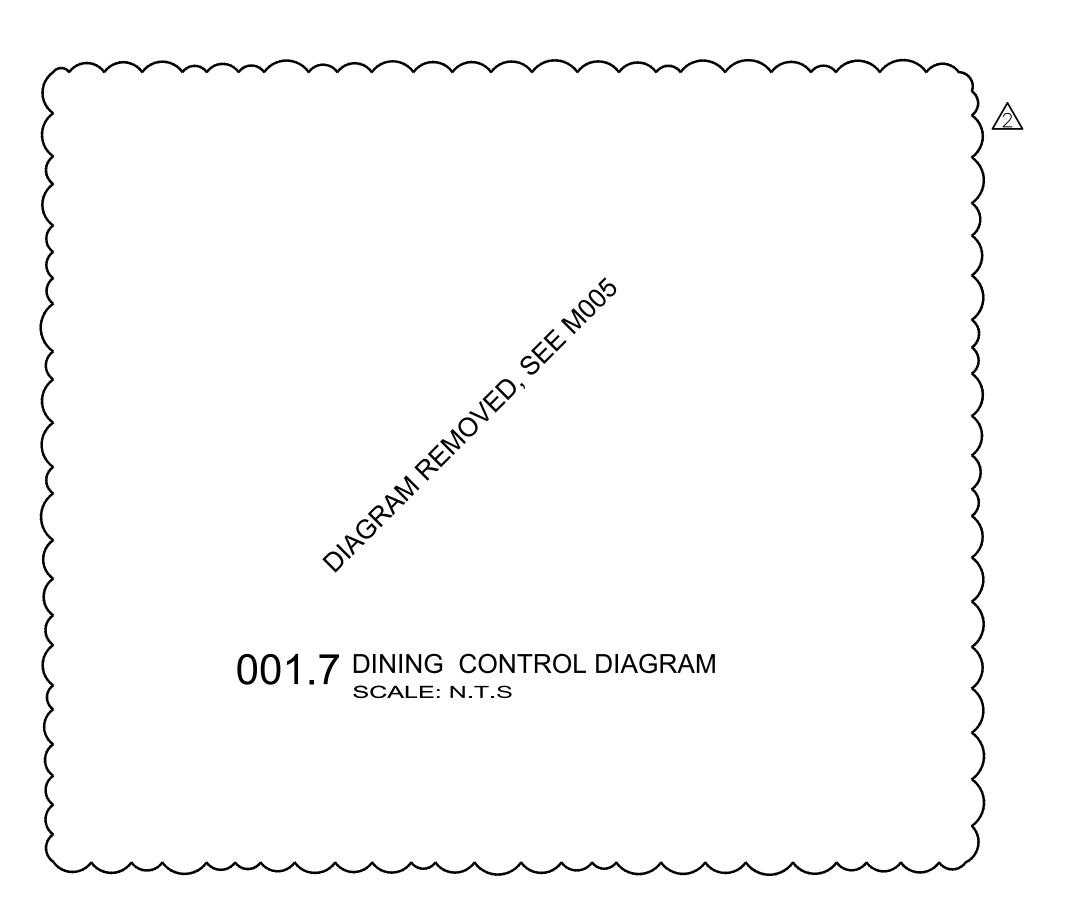
33. BMS UNIT CONTROLLER SHALL HAVE 7 DAY PROGRAMING, 2 DEGREE LOCAL ADJUSTMENT, LOCAL TIMED OVER-RIDE AND THE ABILITY TO RUN FANS IN OCCUP. MODE & CYCLE FANS IN UN-OCCUP.

MODE.

34. THE M.C. & C.C. SHALL PROTECT EQUIPMENT DURING CONSTRUCTION, WELDING & BRAZING AS REQ'D. CLEAN ALL EQUIP. SURFACES OF GREASE, DIRT, DUST, & OTHER FOREIGN MATERIALS PRIOR TO PROJECT CLOSEOUT.

35. MECHANICAL CONTRACTOR SHALL CHANGE NEW UNIT FILTERS AFTER EACH MONTH OF RUN TIME, AND SHALL LEAVE ONE CHANGE OF FILTERS FOR EACH UNIT FOR OWNER TO USE FOR NEXT FILTER

36. MECHANICAL CONTRACTOR SHALL NOT ALLOW DUCTWORK TO CONTACT LAY—IN LIGHT FIXTURES. ROUTE ACCORDINGLY.

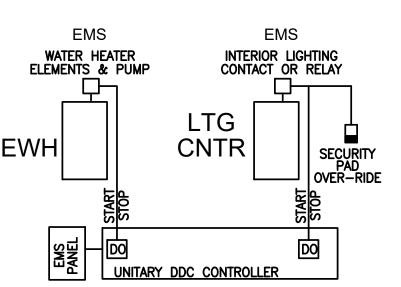




UPON RECEIPT OF AN ALARM SIGNAL FROM THE FACP OR ACTIVATION OF THE GLOBAL FAN SHUT-DOWN SWITCH, THE BMS SHALL SHUT DOWN ALL AIR MOVING UNITS (AHU, FC, RTU, ETC.) IN A SAFE MANNER THAT WILL PREVENT ANY DAMAGE TO CHILLERS, PUMPS, CONDENSING UNITS, BOILERS, ETC. SYSTEM SHALL RETURN TO NORMAL OPERATION UPON CANCELLATION OF ALARM.

FIRE DRILL MODE SHALL NOT ACTIVATE GLOBAL FAN SHUT DOWN.

001.6 GLOBAL FAN SHUT-DOWN

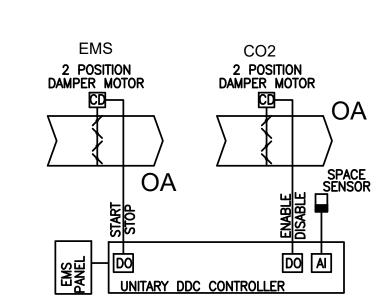


WATER HEATER CONTROL SEQUENCES: EMS SHALL INDEX WATER HEATER ELEMENTS AND RECIRCULATION PUMPS ON 1 HOUR PRIOR TO OWNER-SPECIFIED OCCUPIED HOURS AND INDEX OFF DURING

UNOCCUPIED TIMES INTERIOR LIGHTING CONTACTOR:

EMS SHALL INDEX LIGHTS ON DURING OCCUPIED HOURS BASED ON OWNER PROVIDED SCHEDULE AND OFF WHEN UNOCCUPIED. OVER-RIDE BUILDING TO OCCUPIED MODE UPON SECURITY SYSTEM BEING DISARMED DURING UNOCCUPIED TIME AND RESET WHEN RE-ARMED. CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL LTG CONTACTORS OR RELAYS IN EACH WING AS REQ'D TO CONTROL THE LIGHTS IN THAT WING. CLOSELY COORDINATE WITH E.C. PRIOR TO ROUGH-IN.

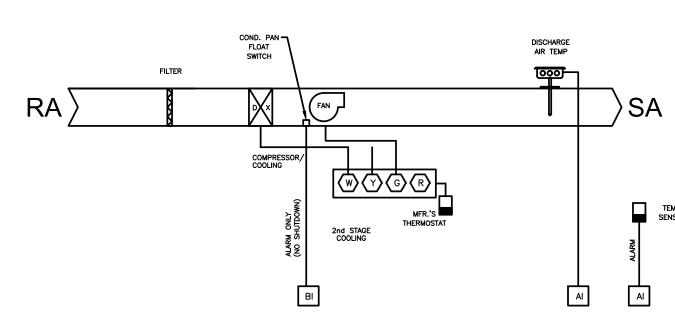
EQUIPMENT ON TIME CLOCK CONTROL SCALE: NONE



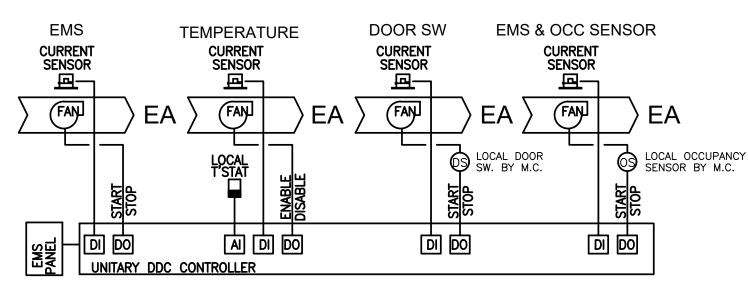
OUTSIDE AIR DAMPER CONTROL SEQUENCES: EMS CONTROL: EMS SHALL INDEX DAMPER OPEN DURING OWNER-SPECIFIED OCCUPIED HOURS AND DRIVE DAMPER CLOSED DURING UNOCCUPIED TIMES. MAINTAIN CLOSED POSITION DURING MORNING WARM-UP. (SEE ALSO UNIT SEQ.) CO2 CONTROL: EMS SHALL INDEX DAMPER OPEN DURING OWNER-SPECIFIED OCCUPIED HOURS TO COINCIDE WITH UNIT OUTDOOR AIR DAMPER CONTROL AND DRIVE DAMPER CLOSED DURING UNOCCUPIED TIMES. DAMPER SHALL BE INDEXED OPEN REGARDLESS OF SCHEDULE UPON SPACE CO2 SENSOR SENSING A CO2 LEVEL ABOVE SET POINT (700 PPM).

OUTSIDE AIR LOUVER DAMPER CONTROL

MDF UNIT CONTROL SEQUENCE: START/STOP: Unit shall run to maintain min. 68^F (adj) year—round temperature. TEMPERATURE CONTROL: Unit is provided with manufacturer's thermostat which controls the DX condenser and SA fan to maintain space temperature. SAFETIES: A condensate pan float switch will activate an alarm upon being activated; however the unit shall continue to operate.



001.3 MDF/IDF UNIT CONTROL DIAGRAM



001.2 MISC FAN CONTROLS SCALE: NONE

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

ENERGY COST BUDGET PRESCRIPTIVE CLIMATE ZONE: IBC - 4A (CARTERET CO.) THERMAL ZONE WINTER DRY BULB: 18.8°F SUMMER DRY BULB: 91.7°F INTERIOR DESIGN CONDITIONS WINTER DRY BULB: 70°F SUMMER DRY BULB: 75°F RELATIVE HUMIDITY: 50% BUILDING HEATING LOAD: BUILDING COOLING LOAD: MECHANICAL SPACE CONDITIONING SYSTEM DESCRIPTION OF UNIT HEATING EFFICIENCY: COOLING EFFICIENCY: HEAT OUTPUT OF UNIT COOLING OUTPUT OF UNIT: TOTAL BOILER OUTPUT: 2,400 MBH (If oversized, state reason) (EXISTING BOILER TO REMAIN) TOTAL CHILLER OUTPUT: 225 TONS (If oversized, state reason) (EXISTING CHILLERS TO REMAIN) LIST EQUIPMENT EFFICIENCIES EQUIPMENT SCHEDULES WITH MOTORS (Not used for mechanical systems) MOTOR HORSEPOWER: NUMBER OF PHASES: MINIMUM EFFICIENCY: # OF POLES:

DESIGNER STATEMENT:

To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipment requirements of the 2012 North Carolina

energy conservation code.

D. WILSON POU, P.E.



MECHANICAL CONTRACTOR SHALL INCLUDE ALL DEMOLITION, LABOR, MATERIALS, EQUIPMENT, NECESSARY TO REMOVE THE EXISTING JCI CONTROLS SYSTEM COMPLETE. INCLUDING ALL ASSOCIATED WIRING, CABLING, DEVICES, CONTROLLERS, PROGRAMMING, SOFTWARE, ETC. DOWN TO EMPTY RACEWAY AND OUTLET BOXES. RACEWAY AND OUTLET BOXES MAY BE REUSED FOR PULLING NEW WIRING AND CABLING. PROVIDE A NEW TRIDIUM NIAGARA FRONT END AND COMPATIBLE CONTROLS SYSTEM EQUIPMENT, HARDWARE, SOFTWARE, PROGRAMMING, ETC. BY SIEMENS, DISTECH, LYNXSPRING, TRANE OR ABB TO CONTROL THE ENTIRE CAMPUS, SUCH THAT IT WILL BE A FULLY FUNCTIONAL SINGLE SYSTEM AND ABLE TO BE VIEWED, MANIPULATED AND ADJUSTED FROM THE FACILITIES OFFICE LOCATED IN BEAUFORT, NC. SEE LIST OF EXISTING EQUIPMENT BELOW THAT WILL NEED TO BE CONTROLLED BY THE NEW SYSTEM.

EXISTING EQUIPMENT LIST: (INCLUDING BUT NOT LIMITED TO) 2 - CHILLERS (ENABLE/DISABLE)

1 - BOILER (ENABLE/DISABLE) 6 — PUMPS

34 - AIR HANDLERS (HOT AND CHILLED WATER COILS) 2 — MINI SPLITS

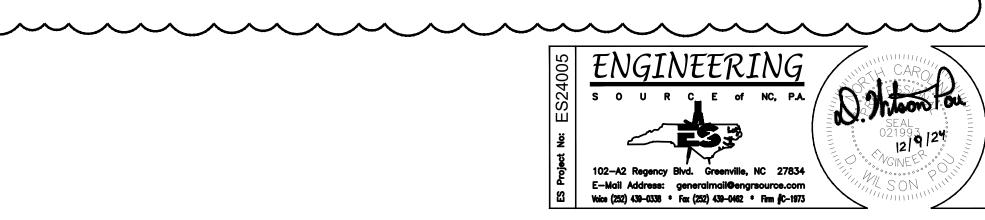
20 – FANS

2 – ELECTRIC UNIT HEATERS 3 - ELECTRIC WATER HEATERS AND ASSOCIATED RE-CIRCULATION PUMPS HIGH TEMPERATURE ALARMS FOR IT CLOSET/ROOM, FREEZER & REFRIGERATOR

CORRIDOR AND BATHROOM LIGHTS BUILDING EXTERIOR LIGHTS PARKING LOT POLE LIGHTS (IF NOT DUSK TO DAWN LIGHTS)

* THIS LIST WAS CREATED FROM RECORD DRAWINGS PROVIDED BY THE OWNER, IT MAY OR MAY NOT CONSTITUTE A COMPLETE LIST. IT IS THE MECHANICAL AND CONTROLS CONTRACTORS' RESPONSIBILITY TO FIELD VERIFY EXISTING CONDITIONS AND ALL EQUIPMENT TO BE CONTROLLED PRIOR TO BID.

<u>DEDUCT ALTERNATE BID:</u>
MECHANICAL CONTRACTOR SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PROGRAMMING, DEVICES, CONTROLLER, POINTS, SOFTWARE, LICENSES AND WARRANTIES NECESSARY TO TIE THE NEW FOUIPMENT IN THE AREAS BEING RENOVATED BACK INTO THE EXISTING JCI CONTROL SYSTEM SUCH THAT IT WILL BE A FULLY FUNCTIONAL SINGLE SYSTEM. MODIFY EXISTING EQUIPMENT WITH EXPANSION CARDS, NEW GRAHICS, SENSORS, DEVICES AND PROGRAMMING AS REQUIRED TO CONTROL NEW AHUS, PUMPS, ETC TO MEET THE NEW SEQUENCE OF OPERATIONS FOR SEAMLESS SYSTEM FUNCTIONALITY.



TYPICAL CLASSROOM UNIT CONTROL DIAGRAM

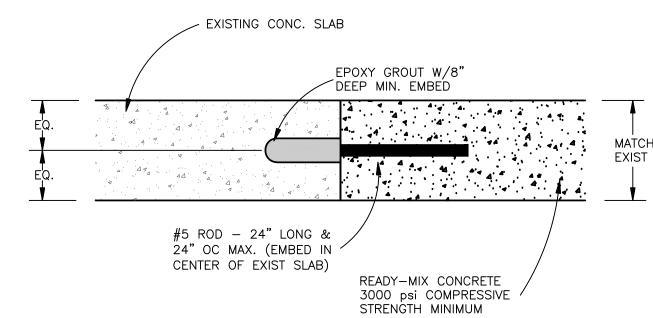
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STRENĠTH MINIMUM

003.1 EQUIPMENT PAD DETAIL SCALE: N.T.S.



003.2 PAD CONNECTION DETAIL SCALE: N.T.S.

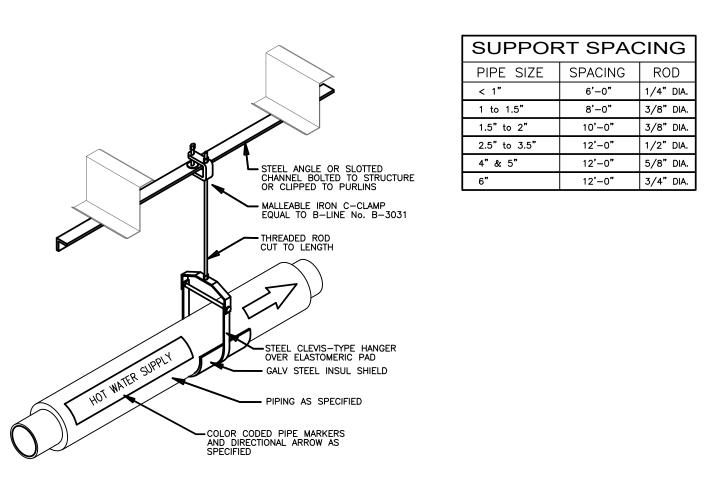
OF A NEW CHILLED WATER BUILDING LOOP PIPING SYSTEM. THE NEW EQUIPMENT SHALL BE TIED TO A NEW ALTERNATE BID BE TIED BACK INTO THE EXISTING JCI CONTROL SYSTEM. CONTROLS SYSTEM SHALL BE ACCESSIBLE BY THE OWNER FOR PROGRAMMING AND MAINTENANCE AND SHALL NOT HAVE ANY PASSWORDS OR LOCK-OUTS THAT PREVENT THE OWNER FROM MAKING DESIRED MODIFICATIONS TO SET POINTS, SCHEDULES, RUN TIMES, ETC. THE NEW CHILLED WATER PIPING SYSTEM SHALL BE FIELD INSULATED NON-METALLIC PIPING. (SEE SPECIFICATIONS).

CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING HYDRONIC AIR HANDLERS WITH ASSOCIATED COIL TRIM, SPLIT DX UNITS, PRE-CONDITION SYSTEMS AND LOOP PUMPS AS INDICATED. THE OLD EQUIPMENT SHALL BE OFFERED TO OWNER FOR SALVAGE. DISPOSE OF ANY EQUIPMENT NOT CLAIMED BY OWNER PROPERLY OFF SITE. CONTRACTOR SHALL INCLUDE ANY AND ALL EQUIPMENT, CRANES, TRANSPORT, LABOR AND MATERIALS ASSOCIATED WITH DISCONNECTING THE UNITS FROM THE EXISTING PIPING, MAINTENANCE PADS AND POWER CIRCUITS. CONTRACTOR SHALL REMOVE ANY AND ALL CONTROL DEVICES ON EXISTING EQUIPMENT AS WELL AS ANY PIPING THAT IS SHOWN TO BE REMOVED. ALL EXISTING CONTROL DEVICES SHALL BE KEPT FOR OWNER SURPLUS UNDER NEW TRIDIUM COMPATIBLE SYSTEM BASE BID OR KEPT FOR RE-USE WHERE APPROPRIATE WITH NEW EQUIPMENT AND NEW SEQUENCES OF OPERATION IF JCI CONTROLS DEDUCT ALTERNATE BID IS ACCEPTED.

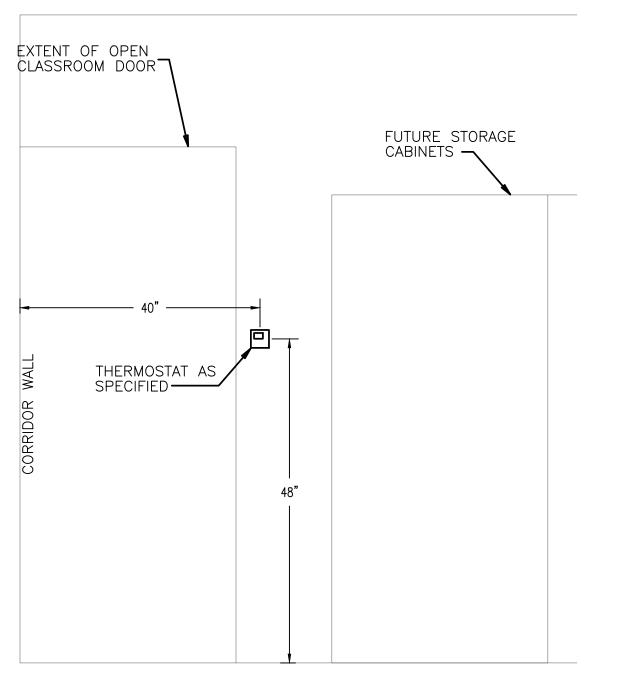
CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF HYDRONIC PIPING AS INDICATED/REQUIRED TO REMOVE AND INSTALL NEW UNITS AND PUMPS. CONTRACTOR SHALL FIELD VERIFY EXACT INSTALLATION LOCATION OF THE AIR HANDLERS AND PUMPS AND SHALL MODIFY HYDRONIC PIPING AS REQUIRED TO CONNECT NEW EQUIPMENT BACK TO EXISTING PIPING AT POINTS INDICATED. NEW ISOLATION VALVES SHALL BE PROVIDED AND INSTALLED WHERE INDICATED ON PLANS AND NEW COIL TRIM SHALL BE PROVIDED FOR HHW & CHW AT EACH UNIT. DRAIN HYDRONIC SYSTEM AS REQUIRED AND RE-FILL AFTER NEW EQUIPMENT IS INSTALLED. SEE SPECIFICATIONS FOR WATER TREATMENT REQUIREMENTS. MC IS RESPONSIBLE FOR UNDERSTANDING AND SCHEDULING THE WORK TO MEET THE PHASING SCHEDULE AS INDICATED.

ELECTRICAL CONTRACTOR SHALL DISCONNECT ELECTRICAL FEEDERS FROM EXISTING PIECES OF EQUIPMENT THAT ARE SHOWN TO BE REPLACED AND REMOVE COMBINATION MOTOR STARTER/DISCONNECTS. MAINTAIN ALL EXISTING FEEDERS FOR RE-USE WHERE NEEDED. REMOVE WIRING/FEEDER BACK TO BREAKER IF NOT REUSED. TURN OFF ANY UNUSED EXISTING BREAKERS AND LABEL AS "SPARE" ON NEW TYPED DIRECTORY. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR ANY MODIFICATIONS THAT NEED TO BE DONE TO THE EXISTING FEEDERS FOR RECONNECTION TO NEW UNITS AND PUMPS.

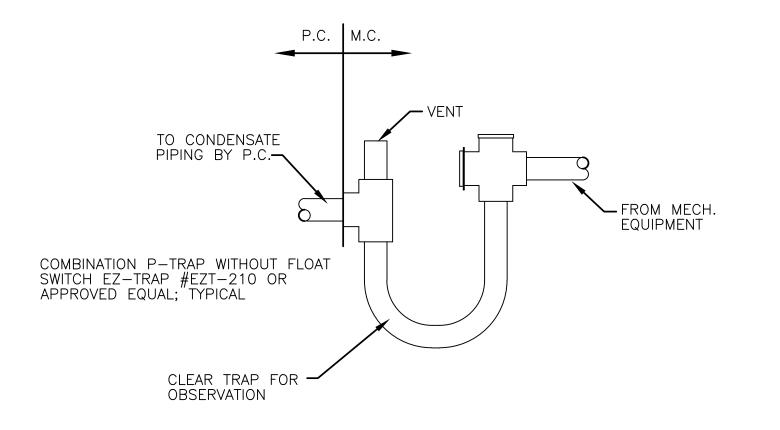
PLEASE MAKE ENGINEER AWARE OF ANY DIFFERENCES BETWEEN THIS SCOPE OF WORK AND THE WORK INDICATED ON THE BID DOCUMENTS PRIOR TO BID. IF NO NOTICE IS RECEIVED IT IS UNDERSTOOD THAT THE CONTRACTOR HAS A FULL UNDERSTANDING OF THE SCOPE OF WORK AND THAT THESE DOCUMENTS HAVE SUFFICIENT INFORMATION INCLUDED IN THEM TO PRODUCE THE DESIRED SCOPE.



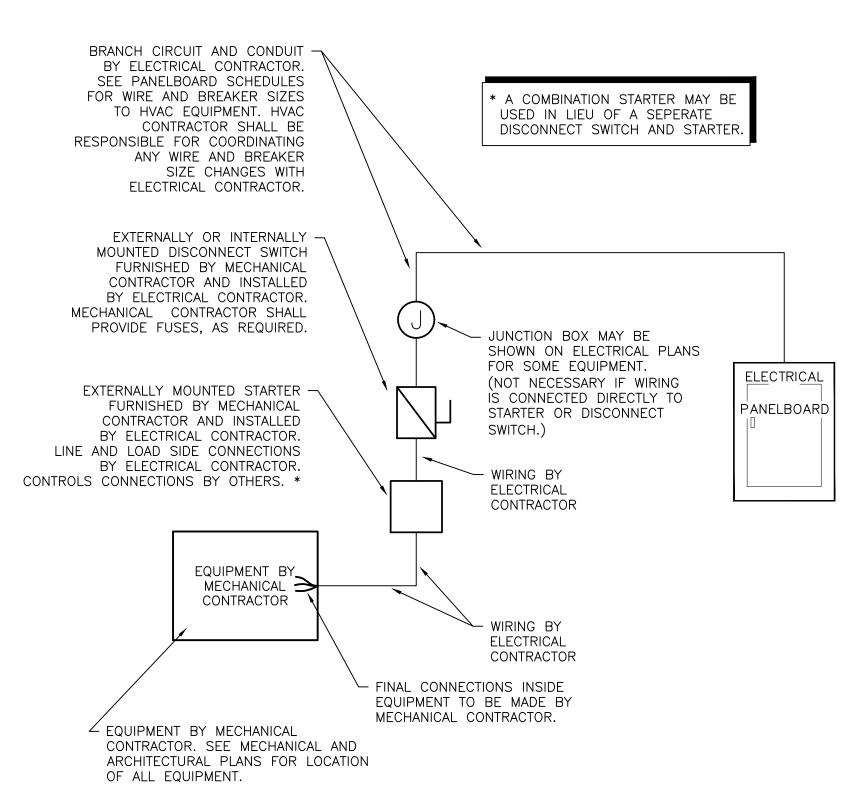
003.3 HYDRONIC PIPE HANGAR DETAIL



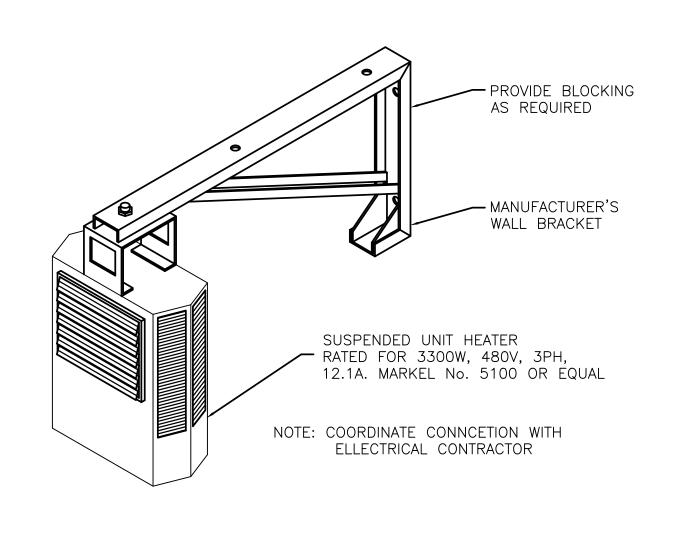
003.4 THERMOSTAT INSTALLATION DETAIL



003.5 CONDENSTATE TRAP DETAIL



MECHANICAL EQUIPMENT 003.6 ELECTRICAL CONNECTION DETAIL

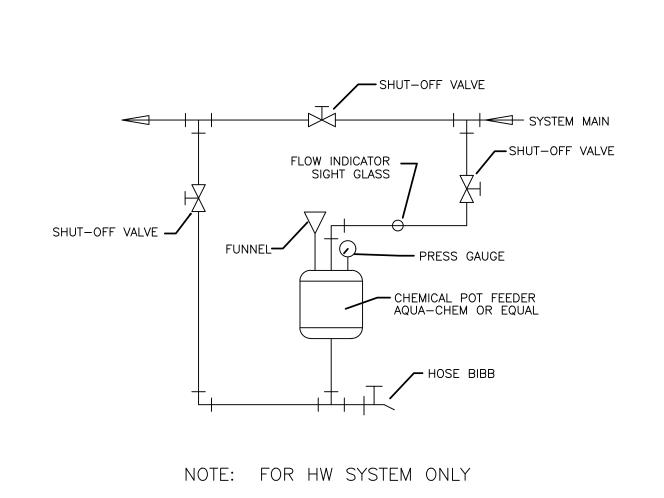


003.7 UNIT HEATER INSTALLATION DETAIL

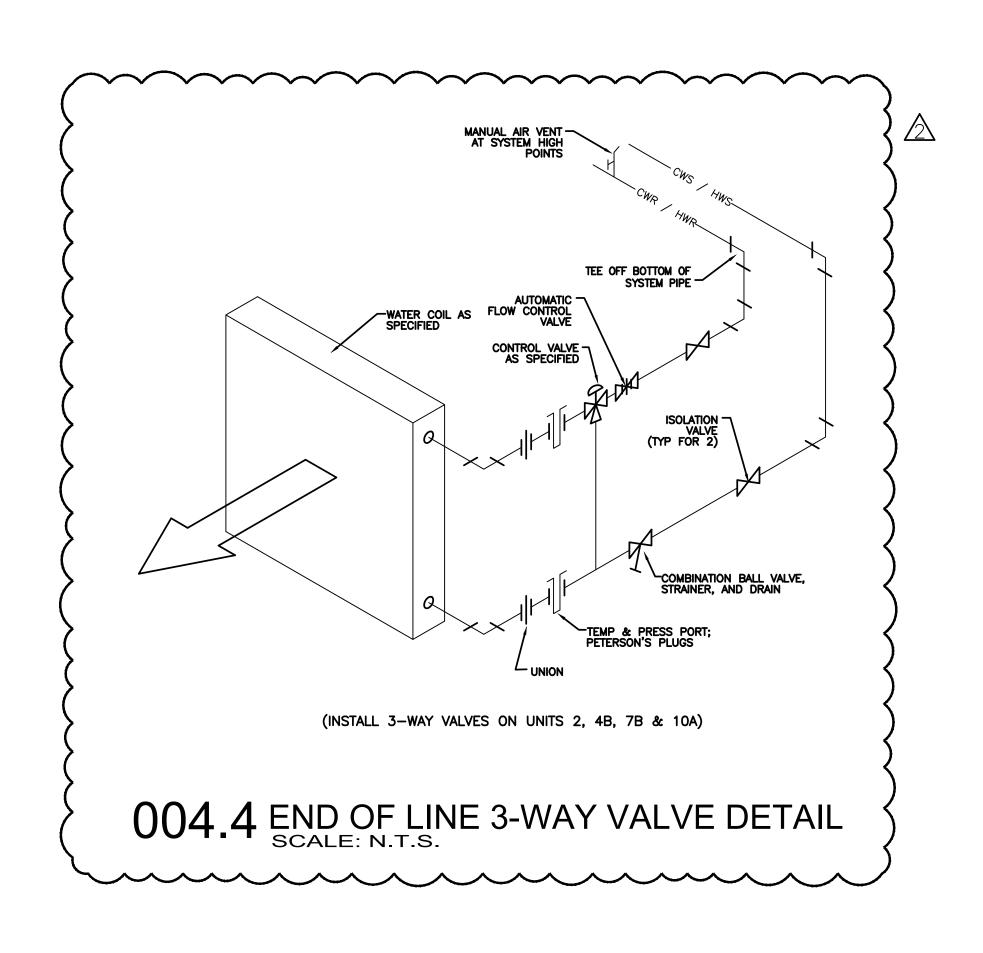
ENGINEERING E-Mail Address: generalmail⊕engrsource.com Voice (252) 439-0338 * Fax (252) 439-0462 * Firm #C-1973

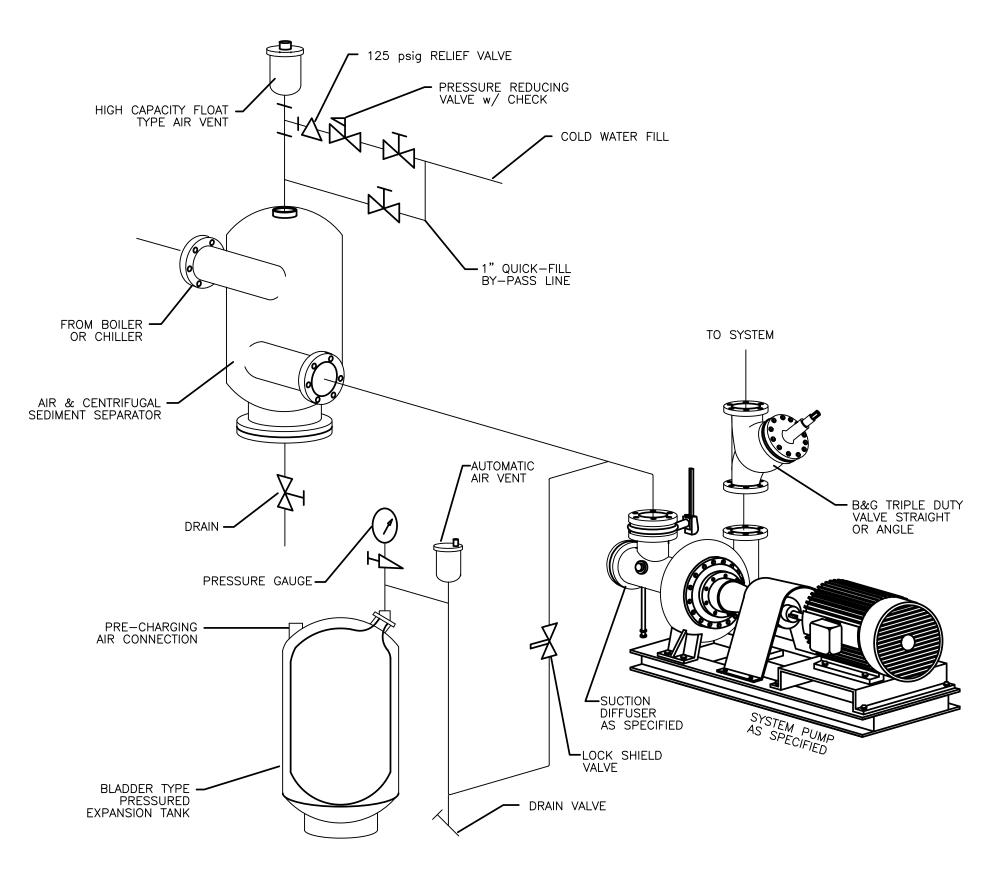
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004.1 BASE MOUNTED END SUCTION PUMP DETAIL SCALE: N.T.S.

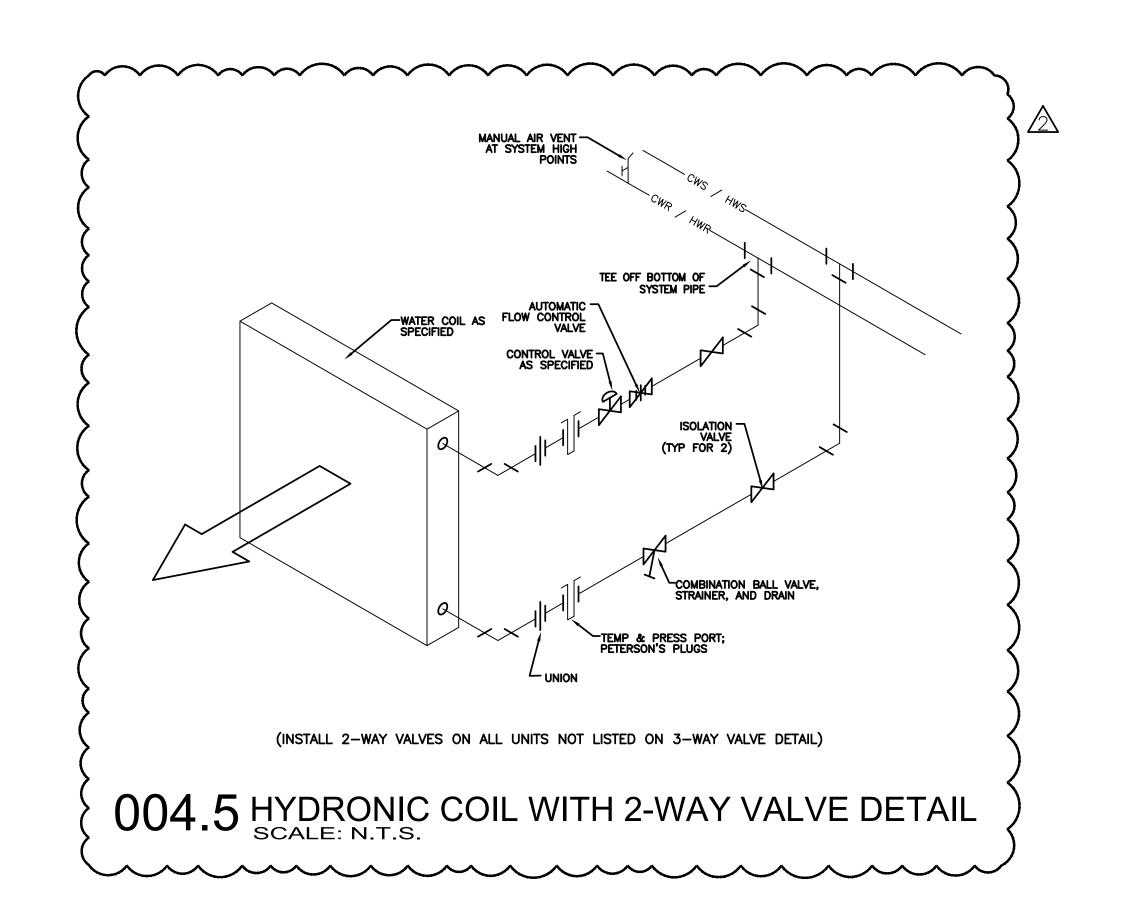


004.3 CHEMICAL SHOT FEEDER DETAIL





004.2 AIR CONTROL DETAIL SCALE: N.T.S.



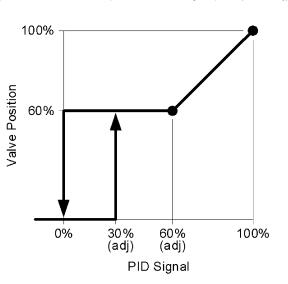
- A. Safety Devices: Safeties shall be in operation at all times (Fan/VFD in auto, hand, override, etc).
- 1. Programmed Freeze Protection a. If mixed air temperature falls below low limit setpoint, modulate dampers to maintain mixed air temperature at low limit setpoint
 - (45°, adj). Low limit PID will have higher priority than the active damper mode as described below. b. If mixed air temperature falls below 39°F (adj), generate an alarm.
- c. When mixed air temperature is below 35°F (adj), stop fan, open cooling valve, and return all other valves and dampers to failed positions. Generate an alarm. Safety shall be programmed and require manual reset (via graphics). BAS shall enable HW plant and enable CHW pumps for water circulation. 2. Freezestat: When the freezestat senses a mixed air temperature below 35°F, stop fan, open cooling valve, and return all other valves and

dampers to failed positions. Generate an alarm, Safety shall be hardwired and require manual reset. BAS shall enable HW plant and

- enable CHW pumps for water circulation. A freezestat trip shall override valve commands for all other safeties (i.e., during simultaneous safety trips, the freezestat valve operation shall take precedent 3. Fire Alarm Shutdown: When the fire alarm is active, stop fan via fire alarm system shut down relay. BAS shall return valves to the off
- positions. Generate an alarm. safety shall be hardwired and require manual reset (via fire alarm system control panel). 4. Float Switch: When the float switch is active, stop fan and return valves and unit outside air damper to off positions. Generate an alarm. Safety shall be hardwired and require manual reset (via graphics). Float switch shall be installed by BAS contractor on auxiliary drain pan.
- 5. After all safeties have cleared, allow AHU fan operation.

Coordinate with equipment.

- B. Fan 1. The fan shall run continuously. Determine fan status through a current sensor. If a fan fails to start as commanded, generate an alarm.
- a. Fan shall have a cooling fan speed and a heating fan speed. See equipment schedule for values. 2. Where a VFD is used with the fan, hard code the speed in the VFD, to be determined by TAB. There shall be no speed command to the VFD from the BAS. Adjustment shall take place in the VFD only.
- a. Note to TAB Contractor: provide fixed speed setpoints to BAS Contractor for programming in VFD. 3. After fan status has been proven, allow remainder of Occupied Mode Operation below.
- C. Outside Air and Return Dampers
- General a. Index all building common outside air dampers to the open position.
- b. The outside air and return dampers shall have a minimum ventilation and demand control ventilation (DCV) mode. Display the active mode on the graphics.
- c. The outside and return dampers shall be modulated using a single signal with an output of 0%-100%. The outside air damper shall be modulated from 0%-100% on a signal of 0%-50%, then the return air damper shall be modulated from 100%-0% on a signal of 50%-100%.
- 2. Minimum Ventilation Operation.
 - a. Index the outside air and return dampers to the minimum outside air position, to be determined by TAB. A) Note to TAB Contractor: Each damper minimum OA position shall be determined individually to maintain the design OA flow (see AHU Schedule). Open the outside air damper fully before closing the return air damper. Record position and
- provide to BAS Contractor for balance point in proframming (non-adj). Do not use actuator end-stops for balancing. 3. Demand Control Ventilation Operation (DCV) a. When space CO2 sensor detects a CO2 level above 1200 ppm, modulate the outside air damper to the maximum position and the
- return air damper to the minimum position. These positions to be determined by TAB. b. If space CO2 remains above 1200 ppm for 30 minutes, generate an alarm. D. Heating (HW)/Cooling (CHW) Coils
- 1. Open/close/modulate the cooling valve to maintain the space at the cooling setpoint (72°F, adj), in accordance with the PID chart below.



- 2. Modulate the heating valve to maintain the space at the heating setpoint (68°F, adj). 3. Provide a minimum 2°F (non-adj) deadband between cooling and heating setpoints.
- 1. If the space temperature is satisfied and relative humidity in the space rises above 65% (adj), slow fan speed to heating fan speed, open the cooling valve to 100%, and modulate the reheat valve to maintain the space at the cooling setpoint. The unit shall return to normal operation when the space relative humidity falls below 55% (adj).
- 2. If space humidity remains above 65% (adj) for 15 minutes (adj), generate an alarm.
- F. Belt (where applicable) 1. Generate an alarm for belt change when fan runtime exceeds user input maximum (8,000 hours, adj).
- G. Additional Control Requirements Provide with wall module.
- a. Wall module shall read space temperature, space humidity, and space CO2 levels (CO2 readings shall be from duct mounted

Unoccupied Mode Operation

- A. Unit shall operate as described above in Occupied Mode Operation, except:
- 1. Fan mode shall be cycle with heating and cooling, without circulation regardless of user selection, valves shall modulate to maintain heating/cooling setpoint, and unit outside air damper shall be in off position.
- 2. Increase cooling setpoint to 78°F (unoccupied cooling setpoint, adj) and decrease heating setpoint to 62°F (unoccupied heating setpoint,
- 3. If the occupancy override is pressed, or the space temperature rises above the unoccupied cooling setpoint, or falls below the unoccupied heating setpoint, place the unit into preoccupancy mode. The unit shall control to the occupied setpoints.
- 4. The unit shall return to unoccupied operation when occupied setpoints are reached, the minimum runtime of 30 minutes (adj) has been

Preoccupancy Mode Operation

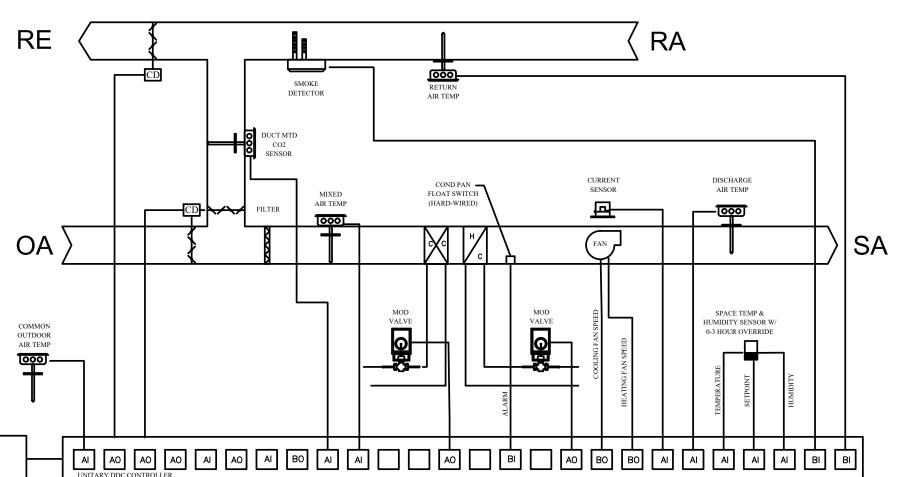
- A. Unit shall enter preoccupancy period prior to occupied period in accordance with the following: 1. Unit shall enter Preoccupancy Mode one hour (owner adjustable) prior to Occupied Mode Schedule.
- B. Unit shall operate as described in Occupied Mode Operation above, except:
- 1. Dampers shall be in off position. Minimum outside air shall not be introduced.
- 2. Fan shall cycle with heating and cooling, without circulation regardless of user selection, valves shall modulate to maintain heating/cooling setpoint.
- C. Once temperature setpoint is reached, unit shall continue to operate in Preoccupancy Mode until BMS schedule changes to Occupied Mode

Graphical Interface

- A. Provide a graphical display for the AHU, with a schematic of the unit and the following points. System on/off
- Occupancy status Float switch(es) and fire alarms
- Freeze protection mixed air temperature alarm and alarm setpoint • Freezestat, static pressure high or low limit, float switch(es), and fire alarm

met, and the occupancy override expires.

- Supply fan status, on/off/alarm Outside and return air damper commands
- Minimum Ventilation and Demand Control Ventilation mode
- Mixed air temperature Demand Control Ventilation setpoints
- HW / CHW coil valve commands
- CHW valve PID open/closed/modulate setpoints Dehumidification mode enable/disable limits
- Belt runtime and time to next change (if applicable) • Space temperature and heating/cooling setpoints
- Space temperature setpoint max and min limits Space override status
- Space humidity, alarm, and alarm setpoint (where applicable) • Space CO2 level, alarm, and alarm setpoint (where applicable)
- Supply air temperature
- B. Provide a tabular graphical display for the following points:
- Associated exhaust fan(s) status, on/off/alarm, speed command, speed feedback, fault and fault text Associated common outside air isolation damper open/closed



005.3 AHU CONTROL DIAGRAM

CHILLED WATER (CHW) PLANT, PRI-SEC W/ DEDICATED PRIMARY PUMPS, AIR-COOLED CHILLERS A) Single DP sensor plants: The BAS shall modulate pump speed to satisfy the DP sensor setpoint (to be determined by TAB, initially 10 psig, adj). If DP sensor signal goes to zero or infinity, generate an alarm and pump speed shall fail to last known speed. A. The CHW plant shall operate and provide CHW to the building: 1) Note to TAB contractor: final DP setpoint shall be sufficient to keep critical circuit CHW coil valve 1. There is a call for cooling from the HVAC system, and between 85 and 95% open. 2. The Building Loop CHWR temperature is greater than or equal to 46°F. Then B) Reference the floorplans for DP sensor location(s). 3. Enable lead chiller and start lead primary pump. C) If any DP sensor is 2 psi (adj) below setpoint for 20 minutes (adj), generate an alarm. B. Calculate building capacity (in tons) using the following formula: Load = (500/12,000) x Flow x (CHWR - CHWS to Building) a. Pumps shall operate in a lead/lag fashion. b. Limit pump ramp speeds (up and down) to prevent pressure blips during staging on and off. c. If the lead pump runs for 15 minutes (adj) above 95% speed (adj), stage on lag pump. Pump speeds should synchronize after approximately five minutes. A. Primary CHW Pumps (PCHWP) d. If the lead and lag pump run for 15 minutes (adj) below 40% speed (adj), stage off lag pump. Ramp lag 1. Chiller shall control its own primary CHW pump via factory controls. Upon chiller enable command, chiller shall pump speed to minimum speed (0%) before stopping. start pump and prove flow prior to starting the chiller. Upon chiller disable command, chiller shall stop, and pump shall continue to run until temperatures/pressures inside chiller have stabilized prior to stopping pump. 3. Scheduled and Failover Rotation 2. Determine pump status through a current sensor. If a pump fails to start as commanded, generate an alarm. a. Pumps shall rotate weekly (adj.) automatically. Via graphics, user shall be able to: Enable command for chiller shall be used as proxy for the CHW pump start. Provide delay to prevent nuisance A) Select which pump shall be lead and lag on the next rotation. B) Schedule the day of week and hour of day to rotate pump. B. Chillers C) Override rotation and keep lead/lag as-is. 1. General D) Rotate pumps immediately. a. Chiller shall be provided with factory controls. Factory controls shall be sufficient and robust enough to allow E) Ability to "lockout" pump for servicing, to prevent rotation to that pump. chiller to operate nearly independently from the BAS. In general, factory controls will stage/modulate compressors, stage/modulate fans, and adjust capacity control to maintain CHW setpoint. Sequences as described below are for the interface between the BAS and factory controls and not intended to fully A) If the lead pump fails, generate an alarm. Disable failed pump and rotate lag pump into lead. Operation describe the chiller operation. Internal safeties (high/low pressure safeties, flow safeties, freeze protection, shall continue as described above. If lag pump is already running, do not stop and restart on rotation to etc) to protect equipment shall be provided by factory as required, in addition to safeties listed below. Factory controls shall be configured/programmed to achieve the sequence as written below. Unless explicitly B) Failed pump shall remain off until alarm is manually cleared (via graphic). Once cleared, pump shall enter stated otherwise, factory will provide all control points, both hardware and software, as shown on the and remain in lag position until next rotation. accompanying schematic or called for in sequence, and wire points back to factory controls. The BAS contractor will interface with the chiller to obtain data for trending, alarming, and graphics purposes. In D. Effective CHWS Temperature Setpoint addition, provide the following points: 1. The following items will control the effective CHWS temperature setpoint, in order of decreasing priority. Display A) Provide with connection to BAS network. the active mode on the graphics. B) Provide with chiller entering water (EWT) and leaving water temperatures (LWT) and communicate a. Operator Override values over BAS network. b. Dehumidification (fixed setpoint) C) Provide with chiller capacity (in percent) and communicate value over BAS network. c. Energy Savings (calculated setpoint) D) Provide with writable point for CHW setpoint and communicate/adjust value over BAS network. 2. The effective CHWS temperature setpoint shall be communicated to chiller factory controls. If the CHWS E) Provide with hardwired chiller enable/disable. temperature is +/-2°F (adj) from effective setpoint for 15 minutes (adj), generate an alarm. Disable CHWS temperature alarm when staging chillers. 2. Staging (Percent Capacity) 3. Dehumidification a. Chillers shall operate in a lead/lag/lag fashion. a. On a call for dehumidification from any piece of equipment utilizing CHW, CHW plant shall enter A) The lead chiller shall remain enabled so long as the CHW plant is enabled. dehumidification mode. b. Stage on first lag chiller if: b. CHWS temperature setpoint shall be 42°F (adj). A) The lead chiller runs for 30 minutes (adj) above 95% capacity (adj) per factory controls, or c. If there is no call for dehumidification from any piece of equipment utilizing CHW for 30 minutes, CHW plant B) The lead chiller runs for 30 minutes (adj) above 95% capacity (adj) per calculated capacity, or shall leave dehumidification mode. C) The CHWS temperature to building is 2°F (adj) above setpoint for 30 minutes (adj). E. Freeze Protection Chiller will via factory controls reach CHW setpoint. Fluctuations in CHWS temperature to building will not 1. On a freezestat trip for any piece of equipment utilizing CHW, enable SCHWP operation. Chillers shall remain exceed 15 minutes. Lag chiller shall remain on for 15 minutes (adj) prior to staging off again. c. Stage off lag chiller if: A) If the lead and lag chiller run for 30 minutes (adj) below 40% capacity (adj) per factory controls, or Graphical Interface B) If the lead and lag chiller run for 30 minutes (adj) below 40% capacity (adj) per calculated capacity. A. Provide a graphical display for the CHW plant, with a schematic of the plant and the following points: Chiller will ramp down and turn off via factory controls. Fluctuations in CHWS temperature to building will not System on/off exceed 15 minutes. First lag chiller shall remain off for 30 minutes (adj) prior to staging on again. Number of CHW calls required for enable setpoint d. Stage on second lag chiller if: EPO and fire alarms A) The lead and first lag chillers both run for 30 minutes (adj) above 95% capacity (adj) per factory controls, Pump status, on/off/alarm, speed command, speed feedback, fault and fault text (each pump/VFD) • Current lead/lag pump, next rotation time, next lead/lag pump (upcoming rotation) and ability to adjust all. B) The lead and first lag chillers both run for 30 minutes (adj) above 95% capacity (adj) per calculated • Pump accumulated runtime and runtime reset (each pump) capacity, or C) The CHWS temperature to building is 2°F (adj) above setpoint for 30 minutes (adj). Chiller enable/disable Chiller will via factory controls reach CHW setpoint. Fluctuations in CHWS temperature to building will not Chiller EWT and LWT (each chiller) exceed 15 minutes. Second lag chiller shall remain on for 15 minutes (adj) prior to staging off again. • Chiller load (tons), percent run load amps (RLA), and percent capacity (each chiller, via hardwire or BAS network e. Stage off second lag chiller if: A) If all chillers run for 30 minutes (adj) below 40% capacity (adj) per factory controls, or • Chiller percent capacity (each chiller, calculated) B) If all chillers run for 30 minutes (adj) below 40% capacity (adj) per calculated capacity. Chiller CHW setpoint (each chiller) Chiller will ramp down and turn off via factory controls. Fluctuations in CHWS temperature to building will • Chiller pressures, temperatures, alarms, and other data via BAS network connection (each chiller) not exceed 15 minutes. First lag chiller shall remain off for 30 minutes (adj) prior to staging on again. • Current lead/first lag/second lag chiller, next rotation time, next lead/first lag/second lag chiller (upcoming 3. Scheduled and Failover Rotation rotation) and ability to adjust all. a. Chillers CH-1 and CH-2 shall be lead and first lag during Occupied Mode Operation and shall rotate weekly Chiller accumulated runtime and runtime reset (each chiller) (adj.) automatically. CH-3 shall be second lag chiller during Occupied Mode Operation. CH-3 shall be lead • Differential pressure and setpoint (each DP sensor) chiller during Unoccupied Mode Operation and CH-1 and CH-2 shall be first lag and second lag chillers and CHW supply and return temperatures to building shall rotate weekly (adj.) automatically. Via graphics, user shall be able to: CHW building flow (in GPM) A) Select which chiller shall be lead, first lag, and second lag on the next rotation. CHW building bypass valve command B) Schedule the day of week and hour of day to rotate chiller. CHW building bypass mixed water temperature C) Override rotation and keep lead/lag/lag as-is. Building CHW Load (in tons) D) Rotate chiller immediately. • Effective CHWS temperature mode, setpoint, and alarm E) Ability to "lockout" chiller for servicing, to prevent rotation to that chiller. • Dehumidification CHWS temperature setpoint A) Chillers CH-1 and CH-2 shall be lead or first lag chillers. CH-3 shall always be second lag chiller in • Chart for CHW OAT reset, with four points shown on chart Occupied Mode Operation unless there is a chiller failure CHW bridge temperature B) If the lead chiller fails, generate an alarm. Disable failed chiller and rotate first lag chiller into lead and B. Provide a graphical table for the CHW System Terminal Load, with the following points: second lag chiller to first lag position. Operation shall continue as described above. If lag chiller is already Equipment Name running, do not disable and restart on rotation to lead and rotate second lag chiller to first lag chiller. CHW valve position C) If the first lag chiller fails, generate an alarm. Disable failed chiller and rotate second lag chiller to first lag Terminal load position. Operation shall continue as described above. If second lag chiller is already running, do not

005.2 CHILLED WATER PLANT CONTROL SEQUENCE

• Dehumidification status/call

• Freeze protection status/call

Criticality ranking

disable and restart on rotation as first lag until failed chiller is operational.

current sensor. If a pump(s) fails to start as commanded, generate an alarm.

current sensor. If a pump(s) fails to start as commanded, generate an alarm.

enter and remain in lag position until next rotation.

C. Secondary CHW Pumps (SCHWP)

a. Occupied Mode Operation

b. Unoccupied Mode Operation

the same speed.

General

D) Failed chiller shall remain off until alarm is manually cleared (via graphic). Once cleared, chiller shall

A) Secondary CHW pump(s) shall run when there is any call for CHW. Determine pump(s) status through a

A) Secondary CHW pump(s) shall run when the CHW plant is enabled. Determine pump(s) status through a

c. The pump(s) speed shall modulate to maintain differential pressure (DP) setpoint. All pumps shall operate at

HOT WATER (HW) PLANT, PRI-SEC W/ DEDICATED PRIMARY PUMPS, ON/OFF STAINLESS STEEL BOILERS A. The HW plant shall operate: 1. There is a call for heating from the HVAC system (either heating or dehumidification call)], or 2. There is a freezestat trip for any piece of equipment utilizing HW. Then 3. Start lead HW boiler and start lead primary pump. B. Calculate building capacity (in MBH) using the following formula: Load = $(500/12,000) \times Flow \times (CHWR - CHWS to Building)$ A. Safety Devices: Safeties shall be in operation at all times (HW boiler/Pump in auto, hand, override, etc). 1. Remote Emergency Power Off (EPO) Shutdown: When the EPO is pressed, stop boilers and pumps. Generate an alarm. Safety shall be hardwired to boilers, networked to pumps, and require manual reset. 2. After all safeties have cleared, allow HW plant operation. B. Primary HW Pumps (PHWP) 1. BAS shall control primary HW pumps (PHWP). Upon HW boiler start command, BAS shall start pump and prove flow for 2 minutes (adj) prior to starting the HW boiler. Upon HW boiler stop command, HW boiler shall be stopped, and pump shall continue to run until temperatures inside HW boiler have stabilized (5 minutes, adj) prior to stopping pump. 2. Determine pump status through a current sensor. If a pump fails to start as commanded, generate an alarm. C. HW Boilers General a. Internal safeties (high pressure/temperature safety, flow safeties, etc) to protect equipment shall be provided by factory as required. In addition, provide the following points: A) Provide with hardwired HW boiler start/stop. Staging (PID Control) a. HW boilers will operate in a lead/lag fashion. b. When HW plant is enabled, enable PID and stage HW boilers on/off to maintain HWS setpoint. A) Stage 1: Lead HW boiler B) Stage 2: Lag HW boiler C) PID shall be tuned to minimize fluctuations in HWS temperature while not creating excessive start/stops of HW boilers. HW boilers shall remain off for 15 minutes (adj) prior to staging on again. 3. Scheduled and Failover Rotation a. HW boiler shall rotate weekly (adj.) automatically. Via graphics, user shall be able to: A) Select which HW boiler shall be lead and lag on the next rotation. B) Schedule the day of week and hour of day to rotate HW boiler. C) Override rotation and keep lead/lag as-is. D) Rotate HW boiler immediately. E) Ability to "lockout" HW boiler for servicing, to prevent rotation to that HW boiler. A) If the lead HW boiler fails, generate an alarm. Disable failed HW boiler and rotate lag HW boiler into lead. Operation shall continue as described above. If lag HW boiler is already running, do not disable and restart on rotation to lead. B) Failed HW boiler shall remain off until alarm is manually cleared (via graphic). Once cleared, HW boiler shall enter and remain in lag position until next rotation. D. Secondary HW Pumps (SHWP) General a. Occupied Mode Operation A) Secondary HW pump(s) shall run when there is any call for heating or dehumidification. Determine pump(s) status through a current sensor. If a pump(s) fails to start as commanded, generate an alarm. b. Unoccupied Mode Operation A) Secondary HW pump(s) shall run when the HW plant is enabled. Determine pump(s) status through a current sensor. If a pump(s) fails to start as commanded, generate an alarm. c. The pump(s) speed shall modulate to maintain differential pressure (DP) setpoint. All pumps shall operate at A) Single DP sensor plants: The BAS shall modulate pump speed to satisfy the DP sensor setpoint (to be determined by TAB, initially 10 psig, adi). If DP sensor signal goes to zero or infinity, generate an alarm and pump speed shall fail to last known speed. 1) Note to TAB contractor: final DP setpoint shall be sufficient to keep critical circuit CHW coil valve between 85 and 95% open. B) Reference the floorplans for DP sensor location(s). d. If any DP sensor is 2 psi (adj) below setpoint for 20 minutes (adj), generate an alarm. Staging a. Pumps shall operate in a lead/lag fashion. b. Limit pump ramp speeds (up and down) to prevent pressure blips during staging on and off. c. If the lead pump runs for 15 minutes (adj) above 95% speed (adj), stage on lag pump. Pump speeds should synchronize after approximately five minutes. d. If the lead and lag pump run for 15 minutes (adj) below 40% speed (adj), stage off lag pump. Ramp lag pump speed to minimum speed (0%) before stopping. 3. Scheduled and Failover Rotation a. Pump shall rotate weekly automatically. Via graphics, user shall be able to: C) Select which pump shall be lead and lag on the next rotation. D) Schedule the day of week and hour of day to rotate pump. E) Override rotation and keep lead/lag as-is. F) Rotate pumps immediately. G) Ability to "lockout" pump for servicing, to prevent rotation to that pump. b. Failover A) If the lead pump fails, generate an alarm. Disable failed pump and rotate lag pump into lead. Operation shall continue as described above. If lag pump is already running, do not stop and restart on rotation to B) Failed pump shall remain off until alarm is manually cleared (via graphic). Once cleared, pump shall enter and remain in lag position until next rotation. E. Effective HWS Temperature Setpoint 1. The following items will control the effective HWS temperature setpoint, in order of decreasing priority: a. Cold-End Corrosion Temperature Setpoint (Cast-Iron Boilers only) b. Operator Override 2. The HWS temperature to the building shall be controlled to the effective HWS temperature setpoint. If the HWS temperature is +/-10°F (adj) from effective setpoint for 15 minutes (adj), generate an alarm. Disable HWS temperature alarm when staging HW boilers 3. Cold-End Corrosion Temperature Setpoint (Cast-Iron Boilers only): provide a minimum HWS return water temperature setpoint of 140°F (hardcoded, non-adj) to prevent possible cold-end corrosion of boiler. HWS shall control the boilers to ensure return water temperature does not drop below setpoint. Graphical Interface A. Provide a graphical display for the HW plant, with a schematic of the plant and the following points: HW boiler start/stop System on/off • Number of HW calls required for enable setpoint EPO and fire alarms • Pump status, on/off/alarm, speed command, speed feedback, fault and fault text (each pump/VFD) • Current lead/lag pump, next rotation time, next lead/lag pump (upcoming rotation) and ability to adjust all.

005.1 HOT WATER PLANT CONTROL SEQUENCE SCALE: N.T.S.

B. Provide a graphical table for the HW System Terminal Load, with the following points

• Pump accumulated runtime and runtime reset (each pump)

• HW boiler percent capacity (each HW boiler, in percent)

• Differential pressure and setpoint (each DP sensor)

• HW supply and return temperatures to building

• HW secondary bypass mixed water temperature

• Effective HWS temperature setpoint and alarm

• Chart for HW OAT reset, with four points shown on chart

• HW supply temperature setpoint and alarm

HW secondary bypass valve command

HW bridge temperature

• HW secondary flow (in GPM)

• Building HW Load (in MBH)

• Dehumidification status/call • Freeze protection status/call

 Equipment Name HW valve position Terminal load

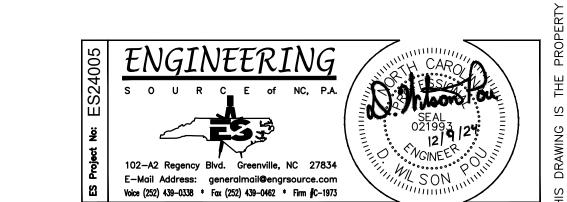
Criticality ranking

• HW boiler accumulated runtime and runtime reset (each HW boiler)

• Current lead/lag HW boiler, next rotation time, next lead/lag HW boiler (upcoming rotation) and ability to adjust

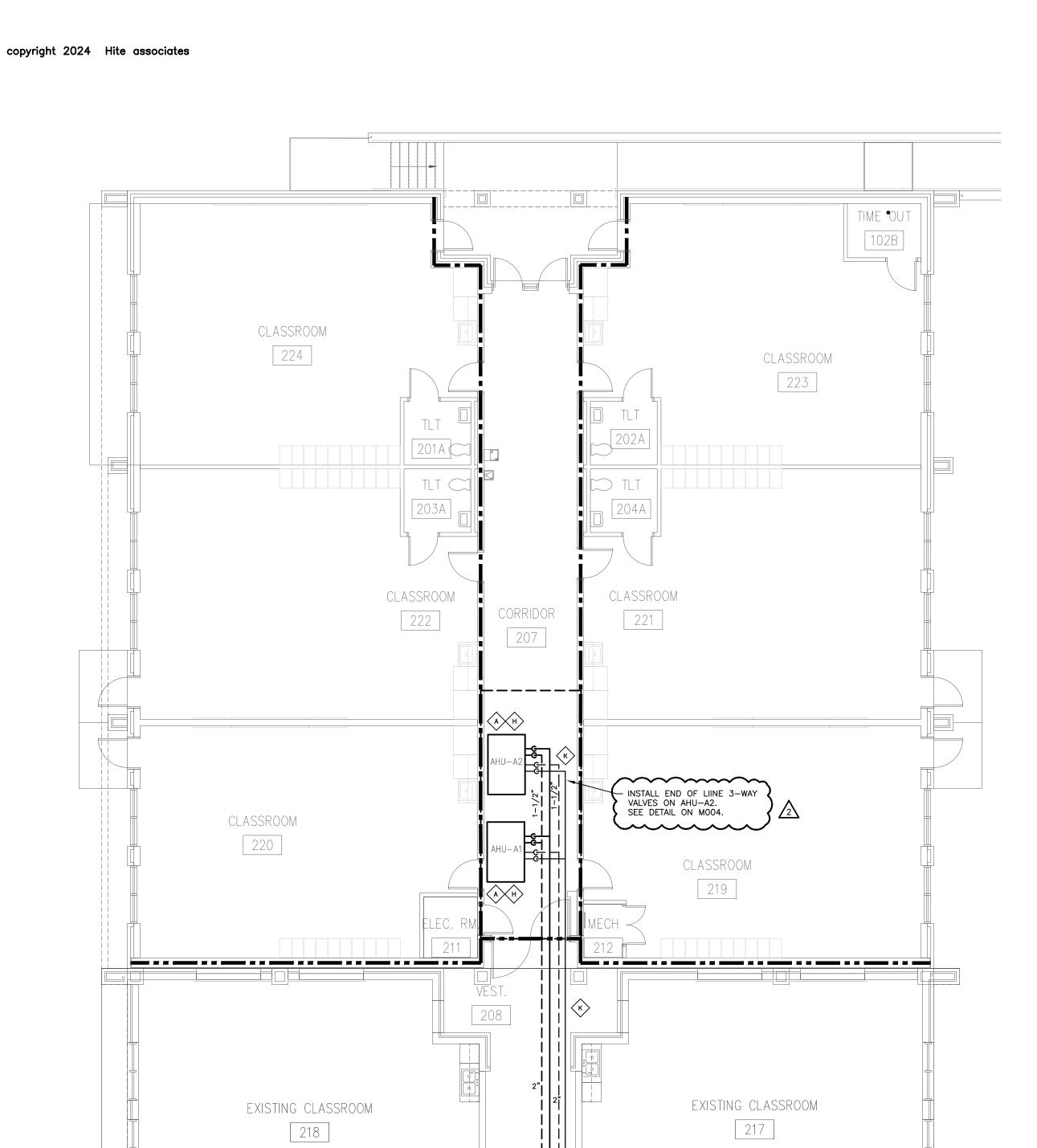
HW boiler EWT and LWT (each HW boiler)

• HW boiler load (each HW boiler, in MBH)

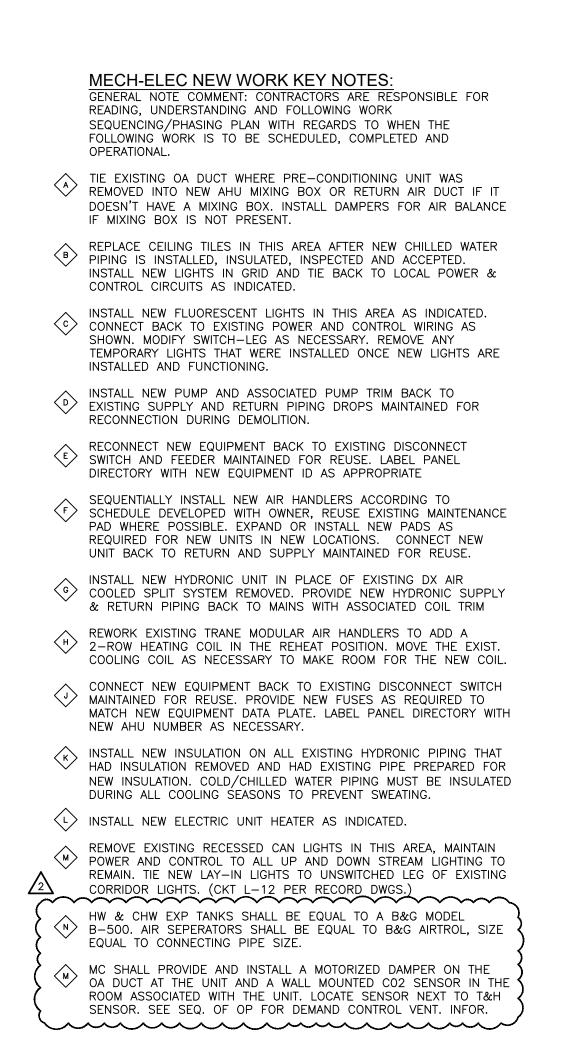


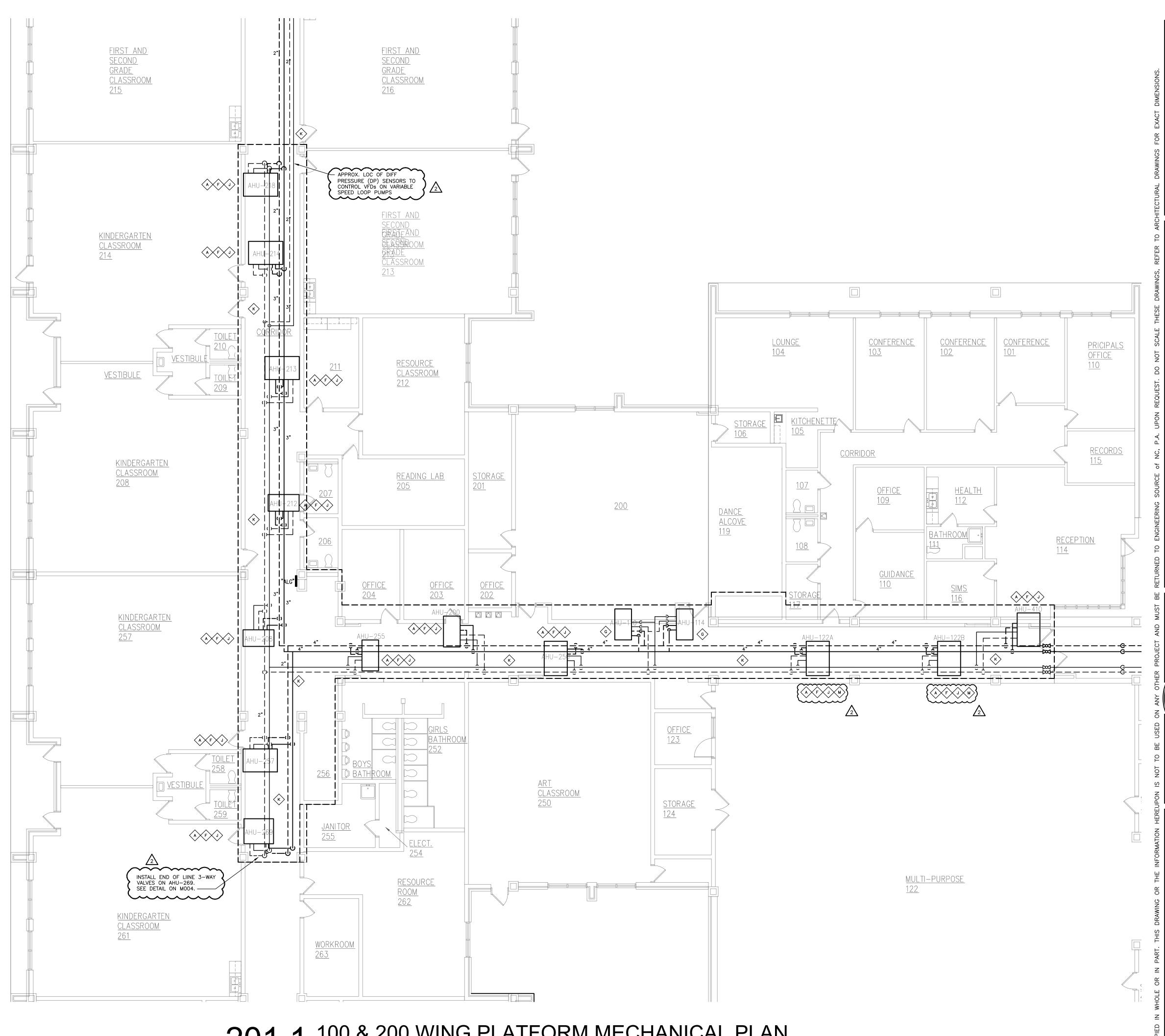
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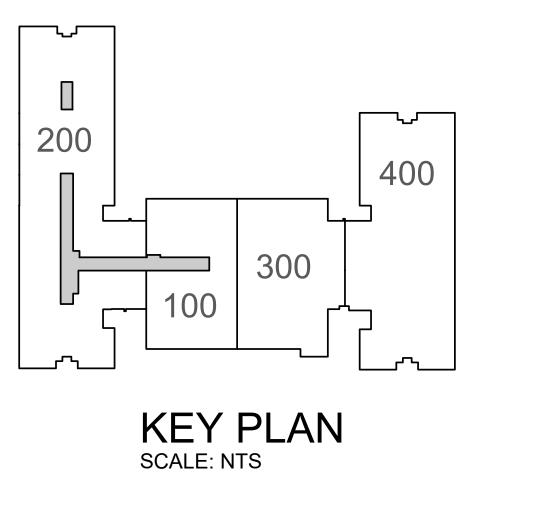


201.2 UPPER 200 WING PLATFORM MECHANICAL PLAN SCALE: 1/8" = 1'-0"



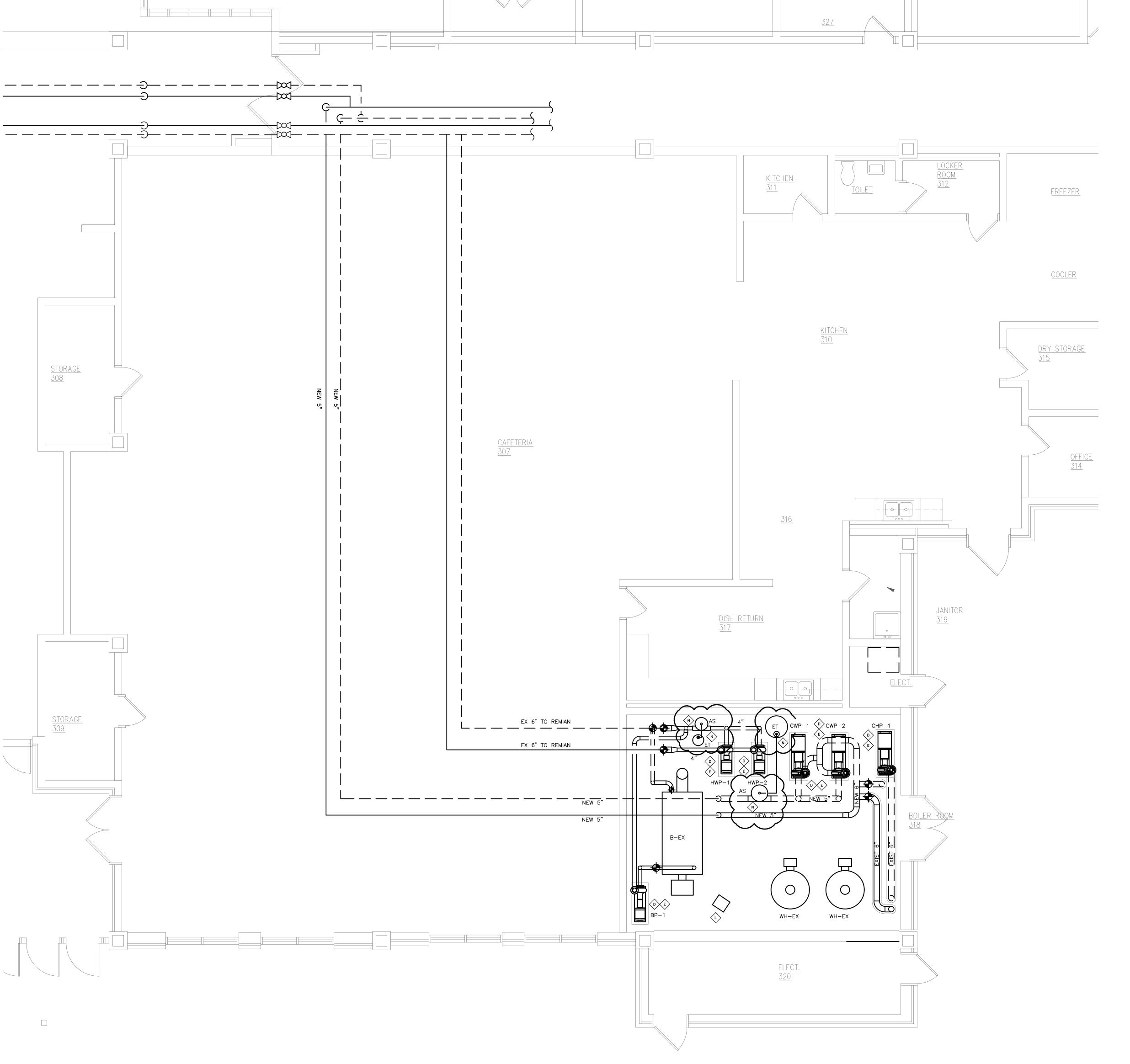


201.1 100 & 200 WING PLATFORM MECHANICAL PLAN SCALE: 1/8" = 1'-0"





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301.1 ENLARGED 300 WING MECHANICAL PLAN SCALE: 1/4" = 1'-0"

MECH-ELEC NEW WORK KEY NOTES:

GENERAL NOTE COMMENT: CONTRACTORS ARE RESPONSIBLE FOR READING, UNDERSTANDING AND FOLLOWING WORK

SEQUENCING/PHASING PLAN WITH REGARDS TO WHEN THE FOLLOWING WORK IS TO BE SCHEDULED, COMPLETED AND

- TIE EXISTING OA DUCT WHERE PRE—CONDITIONING UNIT WAS REMOVED INTO NEW AHU MIXING BOX OR RETURN AIR DUCT IF IT DOESN'T HAVE A MIXING BOX. INSTALL DAMPERS FOR AIR BALANCE
- DOESN'T HAVE A MIXING BOX. INSTALL DAMPERS FOR AIR BALANCE IF MIXING BOX IS NOT PRESENT.

 REPLACE CEILING TILES IN THIS AREA AFTER NEW CHILLED WATER PIPING IS INSTALLED, INSULATED, INSPECTED AND ACCEPTED.

INSTALL NEW LIGHTS IN GRID AND TIE BACK TO LOCAL POWER & CONTROL CIRCUITS AS INDICATED.

- INSTALL NEW FLUORESCENT LIGHTS IN THIS AREA AS INDICATED.
 CONNECT BACK TO EXISTING POWER AND CONTROL WIRING AS
 SHOWN. MODIFY SWITCH—LEG AS NECESSARY. REMOVE ANY
 TEMPORARY LIGHTS THAT WERE INSTALLED ONCE NEW LIGHTS ARE
 INSTALLED AND FUNCTIONING.
- INSTALLED AND FUNCTIONING.

 INSTALL NEW PUMP AND ASSOCIATED PUMP TRIM BACK TO EXISTING SUPPLY AND RETURN PIPING DROPS MAINTAINED FOR
- RECONNECT NEW EQUIPMENT BACK TO EXISTING DISCONNECT SWITCH AND FEEDER MAINTAINED FOR REUSE. LABEL PANEL DIRECTORY WITH NEW EQUIPMENT ID AS APPROPRIATE

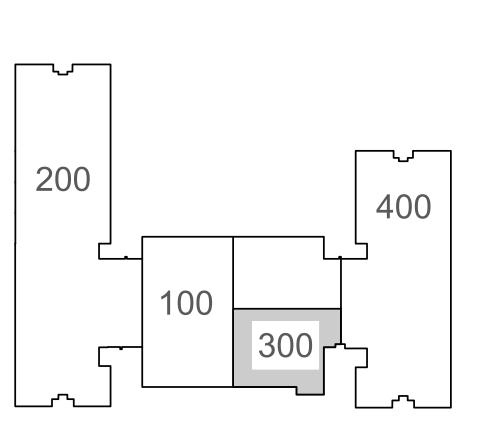
RECONNECTION DURING DEMOLITION.

SEQUENTIALLY INSTALL NEW AIR HANDLERS ACCORDING TO SCHEDULE DEVELOPED WITH OWNER, REUSE EXISTING MAINTENANCE PAD WHERE POSSIBLE. EXPAND OR INSTALL NEW PADS AS REQUIRED FOR NEW UNITS IN NEW LOCATIONS. CONNECT NEW

UNIT BACK TO RETURN AND SUPPLY MAINTAINED FOR REUSE.

- INSTALL NEW HYDRONIC UNIT IN PLACE OF EXISTING DX AIR COOLED SPLIT SYSTEM REMOVED. PROVIDE NEW HYDRONIC SUPPLY & RETURN PIPING BACK TO MAINS WITH ASSOCIATED COIL TRIM
- REWORK EXISTING TRANE MODULAR AIR HANDLERS TO ADD A 2-ROW HEATING COIL IN THE REHEAT POSITION. MOVE THE EXIST. COOLING COIL AS NECESSARY TO MAKE ROOM FOR THE NEW COIL.
- CONNECT NEW EQUIPMENT BACK TO EXISTING DISCONNECT SWITCH MAINTAINED FOR REUSE. PROVIDE NEW FUSES AS REQUIRED TO MATCH NEW EQUIPMENT DATA PLATE. LABEL PANEL DIRECTORY WITH NEW AHU NUMBER AS NECESSARY.
- INSTALL NEW INSULATION ON ALL EXISTING HYDRONIC PIPING THAT HAD INSULATION REMOVED AND HAD EXISTING PIPE PREPARED FOR NEW INSULATION. COLD/CHILLED WATER PIPING MUST BE INSULATED DURING ALL COOLING SEASONS TO PREVENT SWEATING.
- INSTALL NEW ELECTRIC UNIT HEATER AS INDICATED.
- REMOVE EXISTING RECESSED CAN LIGHTS IN THIS AREA, MAINTAIN POWER AND CONTROL TO ALL UP AND DOWN STREAM LIGHTING TO REMAIN. TIE NEW LAY-IN LIGHTS TO UNSWITCHED LEG OF EXISTING CORRIDOR LIGHTS. (CKT L-12 PER RECORD DWGS.)

 HW & CHW EXP TANKS SHALL BE FOLIAL TO A B&G MODEL
- HW & CHW EXP TANKS SHALL BE EQUAL TO A B&G MODEL B-500. AIR SEPERATORS SHALL BE EQUAL TO B&G AIRTROL, SIZE EQUAL TO CONNECTING PIPE SIZE.
- MC SHALL PROVIDE AND INSTALL A MOTORIZED DAMPER ON THE OA DUCT AT THE UNIT AND A WALL MOUNTED CO2 SENSOR IN THE ROOM ASSOCIATED WITH THE UNIT. LOCATE SENSOR NEXT TO T&H SENSOR. SEE SEQ. OF OP FOR DEMAND CONTROL VENT. INFOR.



KEY PLAN SCALE: NTS



-0333

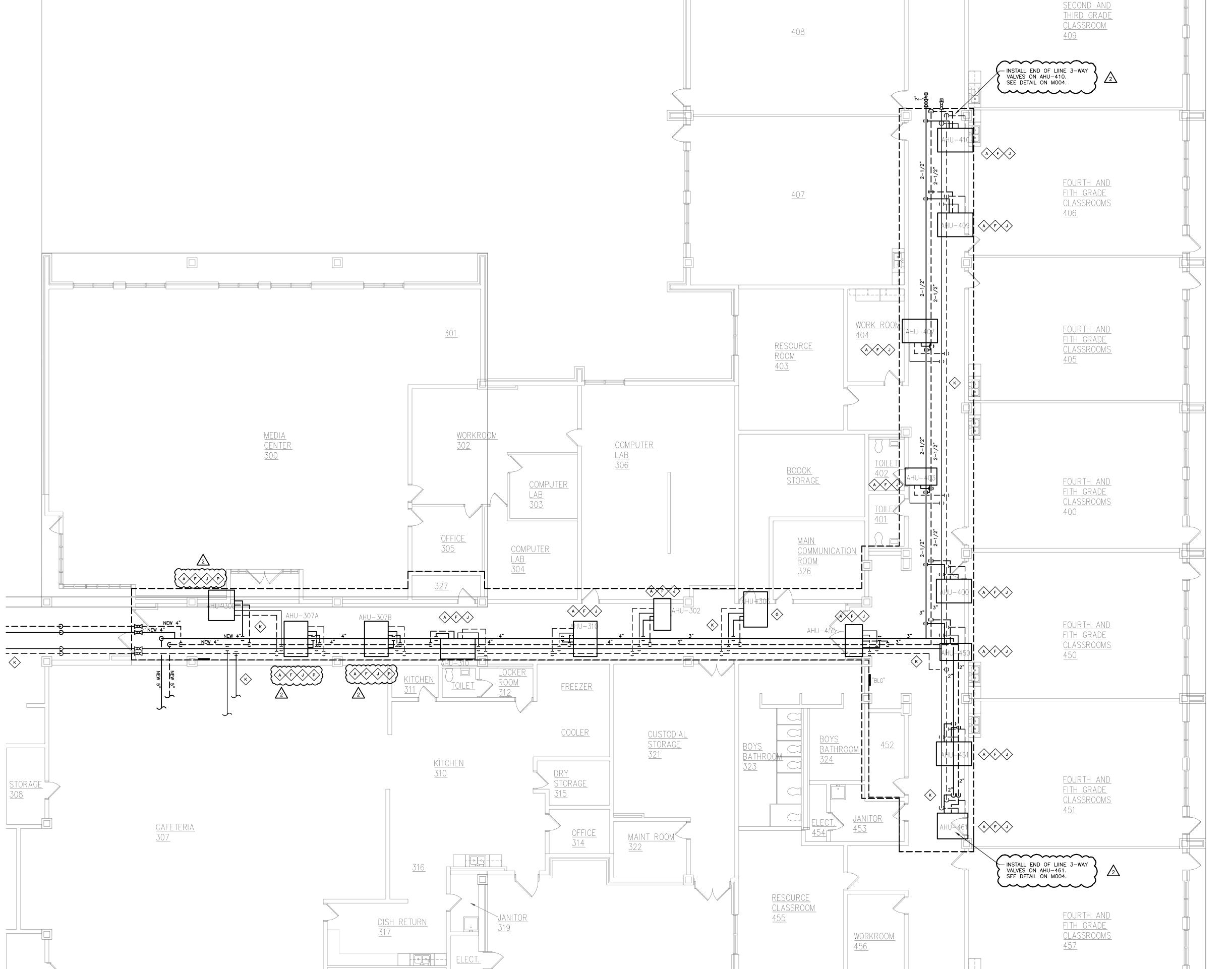
ECTURE / PLANNING / TECHNOLOGY dian Drive / Greenville, NC 27834 / tel (252) 757-03.

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HVAC Renovations to

Elementary Schools 3355 Hwy. 24, Newport, NC 28570
Heret County Schools / North Carolina

Project No. 22419



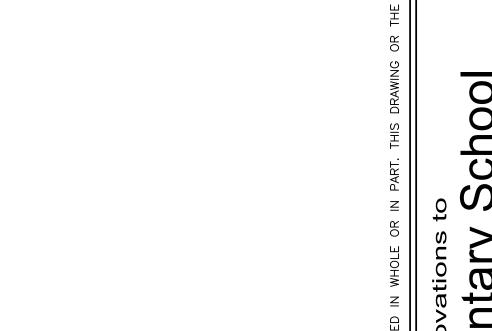
401.1 300 & 400 WING PLATFORM MECHANICAL PLAN SCALE: 1/8" = 1'-0"

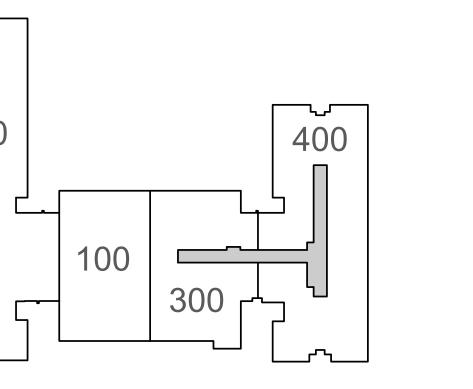
MECH-ELEC NEW WORK KEY NOTES: GENERAL NOTE COMMENT: CONTRACTORS ARE RESPONSIBLE FOR READING, UNDERSTANDING AND FOLLOWING WORK SEQUENCING/PHASING PLAN WITH REGARDS TO WHEN THE FOLLOWING WORK IS TO BE SCHEDULED, COMPLETED AND OPERATIONAL.

- TIE EXISTING OA DUCT WHERE PRE-CONDITIONING UNIT WAS REMOVED INTO NEW AHU MIXING BOX OR RETURN AIR DUCT IF IT DOESN'T HAVE A MIXING BOX. INSTALL DAMPERS FOR AIR BALANCE
- IF MIXING BOX IS NOT PRESENT. REPLACE CEILING TILES IN THIS AREA AFTER NEW CHILLED WATER PIPING IS INSTALLED, INSULATED, INSPECTED AND ACCEPTED.
- INSTALL NEW LIGHTS IN GRID AND TIE BACK TO LOCAL POWER & CONTROL CIRCUITS AS INDICATED. INSTALL NEW FLUORESCENT LIGHTS IN THIS AREA AS INDICATED. CONNECT BACK TO EXISTING POWER AND CONTROL WIRING AS

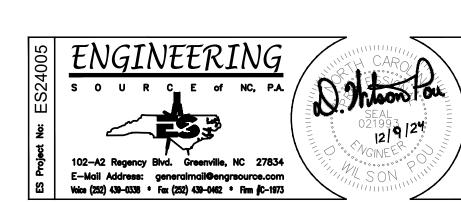
SHOWN. MODIFY SWITCH-LEG AS NECESSARY. REMOVE ANY TEMPORARY LIGHTS THAT WERE INSTALLED ONCE NEW LIGHTS ARE

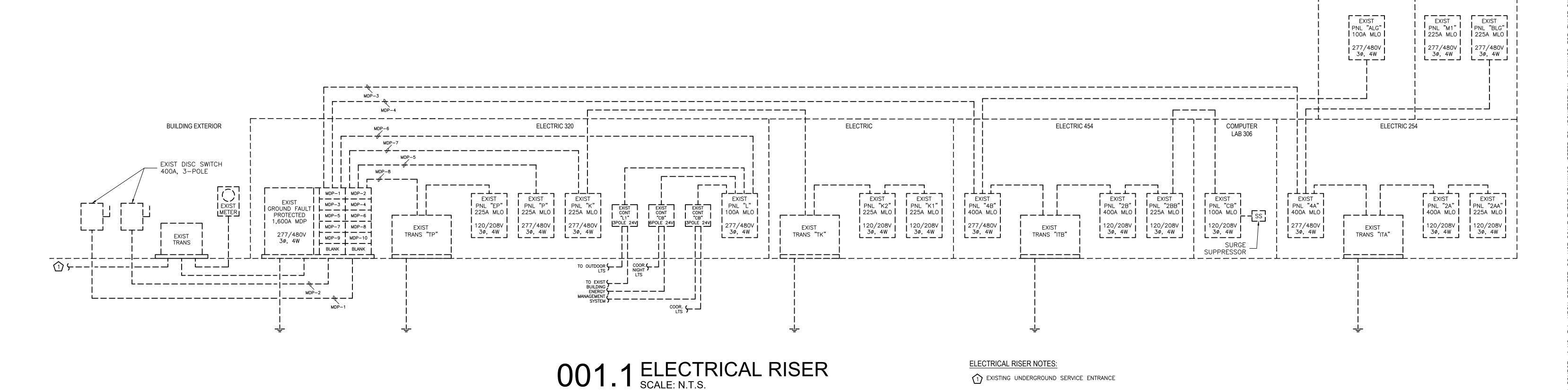
- INSTALLED AND FUNCTIONING. INSTALL NEW PUMP AND ASSOCIATED PUMP TRIM BACK TO EXISTING SUPPLY AND RETURN PIPING DROPS MAINTAINED FOR RECONNECTION DURING DEMOLITION.
- RECONNECT NEW EQUIPMENT BACK TO EXISTING DISCONNECT RECONNECT NEW EQUIPMENT BACK TO EXISTING SITUATION STATEMENT SWITCH AND FEEDER MAINTAINED FOR REUSE. LABEL PANEL DIRECTORY WITH NEW EQUIPMENT ID AS APPROPRIATE
- SEQUENTIALLY INSTALL NEW AIR HANDLERS ACCORDING TO SEQUENTIALLY INSTALL NEW AIR HANDLERS ACCORDING TO SCHEDULE DEVELOPED WITH OWNER, REUSE EXISTING MAINTENANCE PAD WHERE POSSIBLE. EXPAND OR INSTALL NEW PADS AS REQUIRED FOR NEW UNITS IN NEW LOCATIONS. CONNECT NEW UNIT BACK TO RETURN AND SUPPLY MAINTAINED FOR REUSE.
- INSTALL NEW HYDRONIC UNIT IN PLACE OF EXISTING DX AIR COOLED SPLIT SYSTEM REMOVED. PROVIDE NEW HYDRONIC SUPPLY & RETURN PIPING BACK TO MAINS WITH ASSOCIATED COIL TRIM
- REWORK EXISTING TRANE MODULAR AIR HANDLERS TO ADD A 2-ROW HEATING COIL IN THE REHEAT POSITION. MOVE THE EXIST. COOLING COIL AS NECESSARY TO MAKE ROOM FOR THE NEW COIL.
- CONNECT NEW EQUIPMENT BACK TO EXISTING DISCONNECT SWITCH MAINTAINED FOR REUSE. PROVIDE NEW FUSES AS REQUIRED TO MATCH NEW EQUIPMENT DATA PLATE. LABEL PANEL DIRECTORY WITH NEW AHU NUMBER AS NECESSARY.
- INSTALL NEW INSULATION ON ALL EXISTING HYDRONIC PIPING THAT HAD INSULATION REMOVED AND HAD EXISTING PIPE PREPARED FOR NEW INSULATION. COLD/CHILLED WATER PIPING MUST BE INSULATED DURING ALL COOLING SEASONS TO PREVENT SWEATING.
- (L) INSTALL NEW ELECTRIC UNIT HEATER AS INDICATED.
- REMOVE EXISTING RECESSED CAN LIGHTS IN THIS AREA, MAINTAIN POWER AND CONTROL TO ALL UP AND DOWN STREAM LIGHTING TO REMAIN. TIE NEW LAY-IN LIGHTS TO UNSWITCHED LEG OF EXISTING CORRIDOR LIGHTS. (CKT L-12 PER RECORD DWGS.)
- HW & CHW EXP TANKS SHALL BE EQUAL TO A B&G MODEL B-500. AIR SEPERATORS SHALL BE EQUAL TO B&G AIRTROL, SIZE EQUAL TO CONNECTING PIPE SIZE.
- P MC SHALL PROVIDE AND INSTALL A MOTORIZED DAMPER ON THE OA DUCT AT THE UNIT AND A WALL MOUNTED CO2 SENSOR IN THE ROOM ASSOCIATED WITH THE UNIT. LOCATE SENSOR NEXT TO T&H SENSOR. SEE SEQ. OF OP FOR DEMAND CONTROL VENT. INFOR.





KEY PLAN SCALE: NTS





PANELBOARD SCHEDULE - "EP' VOLTAGE: 208/120 PHASE: 3 WIRE: 4 MOUNTING: SURFACE CKT BKR | POLE | WIRE | COND COND WIRE POLE BKR DESCRIPTION | SIZE | SIZE | | SIZE | SIZE | DESCRIPTION 20 | 1 | 12 | 3/4" | WTR HTR CONTROLS REC. ELEC. ROOM B55 | 3/4" | 12 | 1 | 20 | 2 20 1 12 3/4" WTR HTR CONTROLS UNIT HEATER #2 MUA 3/4" 12 1 20 1 12 3/4" CIRC. PUMP 20 1 12 3/4" CIRC. PUMP REC. BOILER ROOM 3/4" 12 1 20 6 20 1 12 3/4" EXTERIOR REC 3/4" 12 1 20 20 1 12 3/4" UNKNOWN LIGHTS 3 20 1 12 3/4" UNKNOWN CELL 3/4" 12 1 20 LIGHTS & PHOTO 20 1 12 3/4" CHILLER HEAT UNKNOWN 20 1 12 3/4" UNKNOWN 3/4" 12 1 20 UNKNOWN 9 20 1 1₂ 3/4" UNKNOWN LIGHT CONTACTOR 3/4" 12 1 2 | 12 | 3/4" |+ **UH-2 BOILER ROOM** SPACE SPARE 6.5 0.0 1.2 1.0 0.0 5.3 0.0 4.4 6.5 0.0 0.0 1.6 0.0 6.0 CONNECTED LOAD (KVA): RECEPTACLES (KVA) DEMAND LOAD (KVA): MOTORS (KVA): PHASE A 6 47.5 PHASE B 10 80.6 NC (KVA): CONNECTED LOAD (AMPS): HEATING (KVA): 6.9 DEMAND LOAD (AMPS):

KVA AMPS

DINING AREA LTS	DINING AREA LTS	DINING AREA LTS	DINING AREA LTS	DINING AREA LTS	DINING AREA LTS
SW-A	SW-B	SW-C	SW-D	SW-E	SW-F

001.2 DINING AREA MULTI-SWITCH DETAIL

TYPE	DESCRIPTION	LAMPS	VOLTS	WATTS	B. F.
Α	2'x4' LAY-IN STEP-DIMMING FLAT PANEL LED WITH ACRYLIC LENS. PROVIDE: COLUMBIA#: SRP24-3050T-LW-G-ESD-U OR LITHONIA#: EPANL-2X4-4000LM-80CRI-40K-MVOLT-SLD OR WILLIAMS#: 50-G-S24-L59/840-SD50-UNV	LED	UNV	40W	ı
В	4' SURFACE MOUNTED WRAP AROUND LED WITH ACRYLIC LENS. PROVIDE: COLUMBIA#: CRW4-LSCS LITHONIA#: FMLWL-LNK-48-ALO4-8SWW2 WILLIAMS#: 39-4-L52/835-A-UNIV	LED	UNV	38W	_
	CEILING OR WALL MOUNTED LED EXIT LIGHT CONFORMING TO NFPA 101 STANDARDS, w/ BATTERY & SOLID STATE CHARGER, SELF DIAGNOSTICS w/ A TEST CYCLE EVERY 30 DAYS MINIMUM, SELF-CONTAINED, DOUBLE OR SINGLE WHITE FACE/BODY, ABS THERMOPLASTIC HOUSING, PILOT & STATUS INDICATING LIGHTS, TEST SWITCH, & 90 MIN. EMERGENCY RUN TIME; EXIT SIGN SHALL HAVE 5 YEAR WARRANTY. PROVIDE HUBBELL #: CER50 OR WILLIAMS #: EXIT-R-EM-WHT-SDT OR LITHONIA #: LQM-S-W-3-R-120/277-ELN-SD	RED LED	UNV 277/ 6V	3.5W	N/A
	AUTOMATIC, SELF-CONTAINED, SELF DIAGNOSTIC, MAINTENANCE FREE 2-HEAD EMERGENCY LIGHT. UL 924 LISTED AND NFPA 101 COMPLIANT, ABS THERMOPLASTIC HOUSING, PILOT & STATUS INDICATING LIGHTS. SELF DIAGNOSTICS SHALL INCLUDE CONTINUOS SELF CHECKS AND 30 MINUTE FULL LOAD TEST WITH CHARGER OFF EVERY 30 DAYS. PROVIDE HUBBELL #: CU2SD OR WILLIAMS #: EMER/LED-WHT-HL-SDT OR LITHONIA #: EU2-LED-M12	2-10W	UNV 277/ 6V	20W	N/A
	CEILING OR WALL MOUNTED LED EXIT & 2—HEAD EMERGENCY LIGHT CONFORMING TO NFPA 101 STANDARDS, W/ BATTERY & SOLID STATE CHARGER, SELF DIAGNOSTICS W/ A TEST CYCLE EVERY 30 DAYS MINIMUM, SELF—CONTAINED, DOUBLE OR SINGLE WHITE FACE/BODY, ABS THERMOPLASTIC HOUSING, PILOT & STATUS INDICATING LIGHTS, TEST SWITCH, & 90 MIN. EMERGENCY RUN TIME, EXIT LIGHT SHALL CONTINUE TO OPERATE FOR 24 HOURS FOLLOWING POWER OUTAGE; EXIT SIGN SHALL HAVE 5 YEAR WARRANTY. PROVIDE HUBBELL #: CCRSD OR LITHONIA #: LHQM—LED—R—HO—SD OR WILLIAMS #: EXIT/EM/LED—SF—R—WHT—HL—SDT	RED LED 2-10W HALOGEN	UNV 277/ 6V	20	N/A
46	WALL MOUNTED SCONCE LIGHT WITH PREMIUM MARINE GRADE DIE—CAST ALUMINUM HOUSING AND POLYCARBONATE GASKETED LENS TO WITHSTAND EXTREME WEATHER CONDITIONS. MOUNT ABOVE EXTERIOR DOOR. EMERGENCY LIGHT SHALL CONFORM WITH NFPA 101 STANDARDS AND NEC—700.16. PROVIDE HUBBELL #: CUWZ—PC OR WILLIAMS #: EMER/DECO—DBR—LT OR	2-6W	UNV 277/6VDC	12W	-

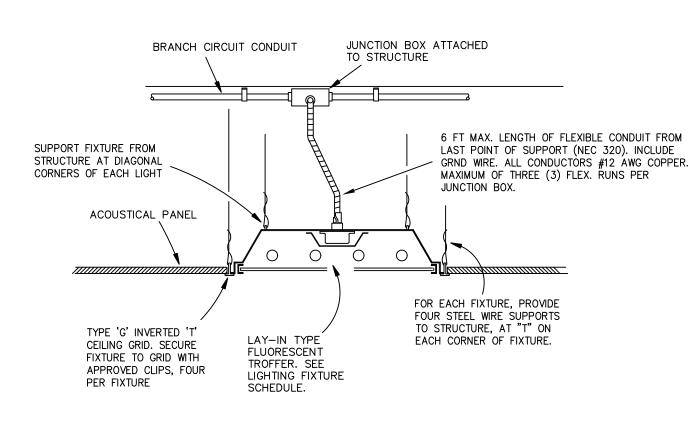
LIGHT FIXTURE SCHEDULE

EP DEMAND CALCS 6.50 KVA X 125 % = **8.1 KVA** RECEPTACTOTAL 1.20 KVA 1ST 10.00 KVA X 100 % = **1.2 KVA** REMAIN 0.00 KVA X 50 % = **0.0 KVA** 1.00 KVA X 100 % = **1.0 KVA** LARGEST 0.00 KVA X 125 % = **0.0 KVA** 0.00 KVA X 100 % = **0.0 KVA** 6.95 KVA X 100 % = **6.9 KVA** EXIST CKTS KVA X 100 % = **0.0 KVA** KITCHEN 0.00 KVA X 65 % = **0.0 KVA** MISCELLANEOUS 10.40 KVA X 100 % = 10.4 KVA 76.8 amps

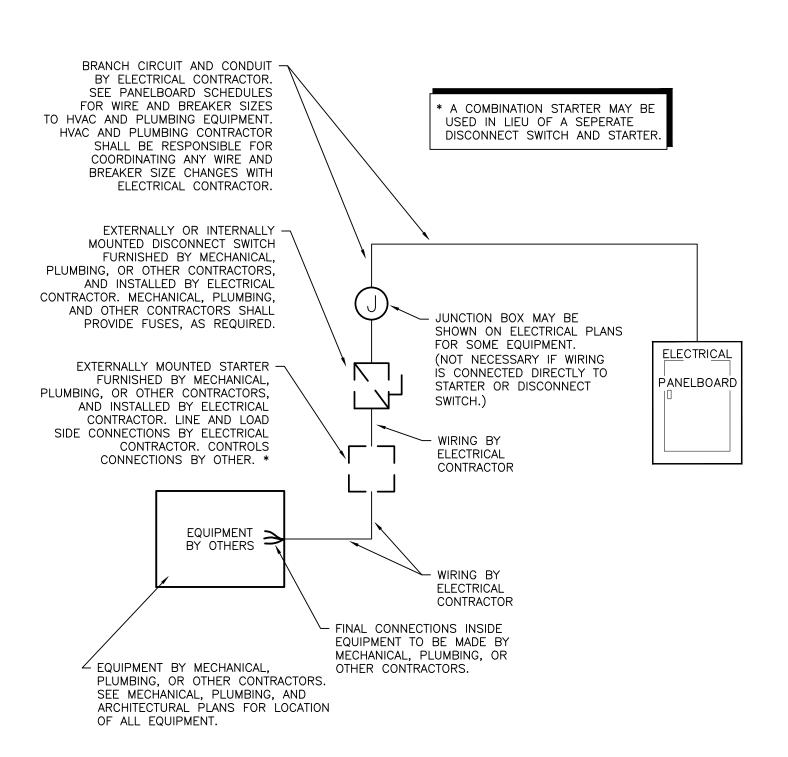
(ITCHEN (KVA):

MISCELLANEOUS (KVA):

NOTES: + INDICATES ADDED BREAKER



001.3 FLUORESCENT / LED TROFFER INSTALLATION SCALE: N.T.S.



001.4 ELECTRICAL CONNECTION DETAIL

SCOPE	OF WORK STATEMENT:	
	INTENT OF THESE PLANS AND SPECIFICATIONS TO SHOW THE THE REMOVAL AND COMPLETE REPLACEMENT OF THE EXISTING	- {
	P AIR HANDLERS, THE BUILDING LOOP PUMPS AND THE INSTALLATION OF A NEW CHILLED WATER BUILDING LOOP PIPING)
		\
	THE NEW EQUIPMENT SHALL BE TIED TO A NEW TRIDIUM NIAGARA COMPATIBLE SYSTEM PER THE SPECIFICATIONS (BASE BID))
	RT OF A DEDUCT ALTERNATE BID BE TIED BACK INTO THE EXISTING JCI CONTROL SYSTEM. CONTROLS SYSTEM SHALL BE	1
	LE BY THE OWNER FOR PROGRAMMING AND MAINTENANCE AND SHALL NOT HAVE ANY PASSWORDS OR LOCK—OUTS THAT)
	THE OWNER FROM MAKING DESIRED MODIFICATIONS TO SET POINTS, SCHEDULES, RUN TIMES, ETC. THE NEW CHILLED WATER	<
	STEM SHALL BE FIELD INSULATED NON-METALLIC PIPING.) .
(SEE SPE	CIFICATIONS).	\
CONTRACT	OD IC DECRONCIDIE FOR THE REMOVAL OF ALL EVICTING HYDRONIC AIR HANDLERG WITH ACCORDATER OOK TRIM, CRUT BY) (2)
	OR IS RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING HYDRONIC AIR HANDLERS WITH ASSOCIATED COIL TRIM, SPLIT DX	\
•	E-CONDITION SYSTEMS AND LOOP PUMPS AS INDICATED. THE OLD EQUIPMENT SHALL BE OFFERED TO OWNER FOR SALVAGE.)
	OF ANY EQUIPMENT NOT CLAIMED BY OWNER PROPERLY OFF SITE. CONTRACTOR SHALL INCLUDE ANY AND ALL EQUIPMENT,	1
•	TRANSPORT, LABOR AND MATERIALS ASSOCIATED WITH DISCONNECTING THE UNITS FROM THE EXISTING PIPING, MAINTENANCE	}
	POWER CIRCUITS. CONTRACTOR SHALL REMOVE ANY AND ALL CONTROL DEVICES ON EXISTING EQUIPMENT AS WELL AS ANY	
	AT IS SHOWN TO BE REMOVED. ALL EXISTING CONTROL DEVICES SHALL BE KEPT FOR OWNER SURPLUS UNDER NEW TRIDIUM	1
	LE SYSTEM BASE BID OR KEPT FOR RE—USE WHERE APPROPRIATE WITH NEW EQUIPMENT AND NEW SEQUENCES OF)
OPERATION	I IF JCI CONTROLS DEDUCT ALTERNATE BID IS ACCEPTED.	\
CONTRACT	OR IS RESPONSIBLE FOR THE REMOVAL OF HYDRONIC PIPING AS INDICATED/REQUIRED TO REMOVE AND INSTALL NEW UNITS)
	PS. CONTRACTOR SHALL FIELD VERIFY EXACT INSTALLATION LOCATION OF THE AIR HANDLERS AND PUMPS AND SHALL MODIFY	\
	PIPING AS REQUIRED TO CONNECT NEW EQUIPMENT BACK TO EXISTING PIPING AT POINTS INDICATED. NEW ISOLATION VALVES)

LITHONIA #: AFN-DB-EXT

SHALL BE PROVIDED AND INSTALLED WHERE INDICATED ON PLANS AND NEW COIL TRIM SHALL BE PROVIDED FOR HHW & CHW AT EACH UNIT. DRAIN HYDRONIC SYSTEM AS REQUIRED AND RE-FILL AFTER NEW EQUIPMENT IS INSTALLED. SEE SPECIFICATIONS FOR WATER TREATMENT REQUIREMENTS. MC IS RESPONSIBLE FOR UNDERSTANDING AND SCHEDULING THE WORK TO MEET THE PHASING SCHEDULE AS INDICATED. ELECTRICAL CONTRACTOR SHALL DISCONNECT ELECTRICAL FEEDERS FROM EXISTING PIECES OF EQUIPMENT THAT ARE SHOWN TO BE

EXISTING UNDERGROUND SERVICE ENTRANCE

NEW TYPED DIRECTORY. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR ANY MODIFICATIONS THAT NEED TO BE DONE TO THE EXISTING FEEDERS FOR RECONNECTION TO NEW UNITS AND PUMPS. PLEASE MAKE ENGINEER AWARE OF ANY DIFFERENCES BETWEEN THIS SCOPE OF WORK AND THE WORK INDICATED ON THE BID DOCUMENTS PRIOR TO BID. IF NO NOTICE IS RECEIVED IT IS UNDERSTOOD THAT THE CONTRACTOR HAS A FULL UNDERSTANDING OF

THE SCOPE OF WORK AND THAT THESE DOCUMENTS HAVE SUFFICIENT INFORMATION INCLUDED IN THEM TO PRODUCE THE DESIRED

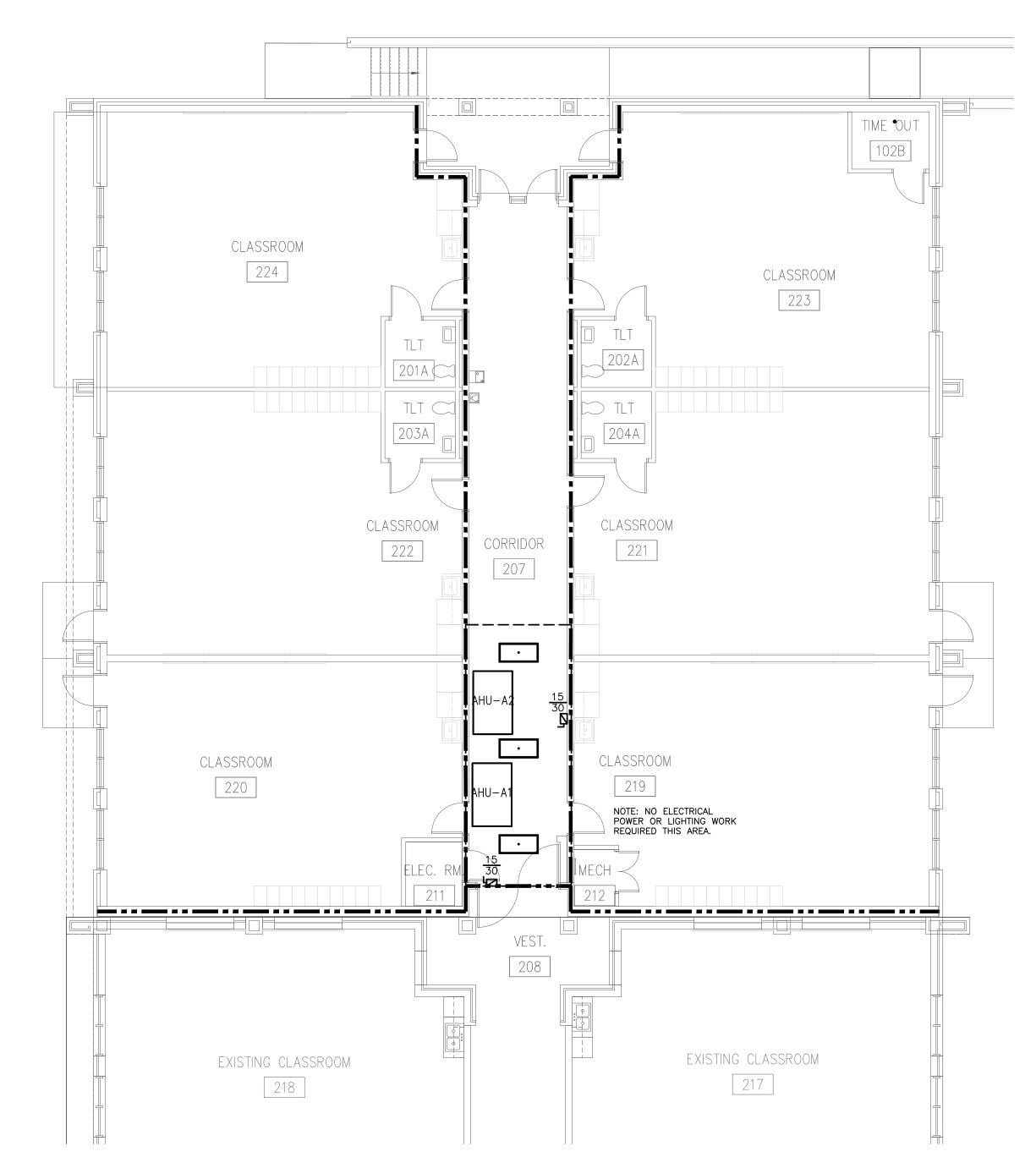
REPLACED AND REMOVE COMBINATION MOTOR STARTER/DISCONNECTS. MAINTAIN ALL EXISTING FEEDERS FOR RE-USE WHERE NEEDED.

REMOVE WIRING/FEEDER BACK TO BREAKER IF NOT REUSED. TURN OFF ANY UNUSED EXISTING BREAKERS AND LABEL AS "SPARE" ON

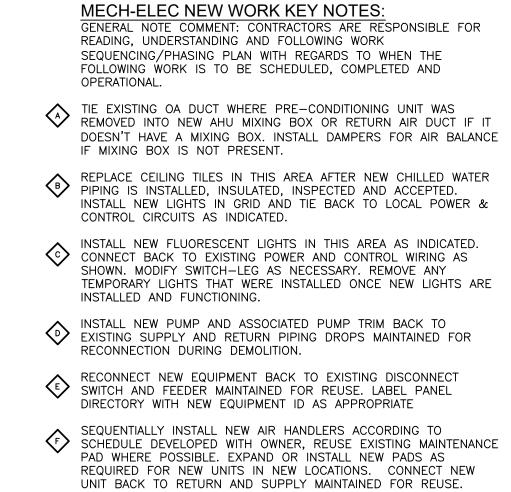
ENGINEERING D. Internal of E-Mail Address: generalmail@engrsource.com Voice (252) 439-0338 * Fax (252) 439-0462 * Firm #C-1973

300 & 400 WING PLATFORM

cho S mentary



201.2 UPPER 200 WING PLATFORM ELECTRICAL PLAN SCALE: 1/8" = 1'-0"



REWORK EXISTING TRANE MODULAR AIR HANDLERS TO ADD A
2-ROW HEATING COIL IN THE REHEAT POSITION. MOVE THE EXIST.
COOLING COIL AS NECESSARY TO MAKE ROOM FOR THE NEW COIL.

INSTALL NEW DISCONNECT (BY MC) AND BACK TO EXISTING CIRCUIT
MAINTAINED FOR REUSE. MC TO PROVIDE NEW FUSES AS REQUIRED
TO MATCH NEW EQUIPMENT DATA PLATE. LABEL PANEL DIRECTORY
WITH NEW AHU NUMBER AS NECESSARY.

INSTALL NEW INSULATION ON ALL EXISTING HYDRONIC PIPING THAT
HAD INSULATION REMOVED AND HAD EXISTING PIPE PREPARED FOR
NEW INSULATION. COLD/CHILLED WATER PIPING MUST BE INSULATED
DURING ALL COOLING SEASONS TO PREVENT SWEATING.

INSTALL NEW ELECTRIC UNIT HEATER AS INDICATED.

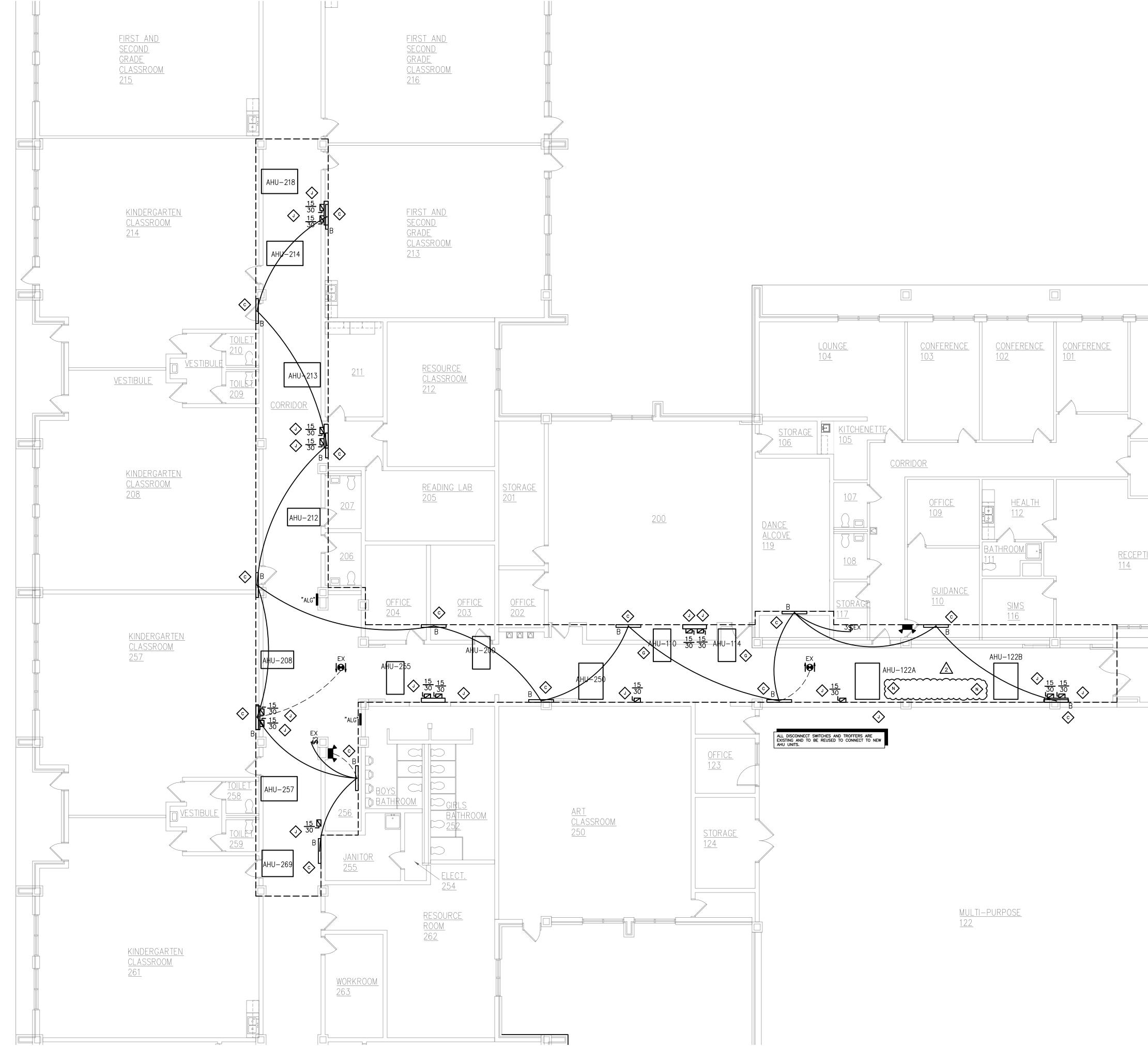
REMOVE EXISTING RECESSED CAN LIGHTS IN THIS AREA, MAINTAIN

REMOVE EXISTING RECESSED CAN LIGHTS IN THIS AREA, MAINTAIN POWER AND CONTROL TO ALL UP AND DOWN STREAM LIGHTING TO REMAIN. TIE NEW LAY-IN LIGHTS TO UNSWITCHED LEG OF EXISTING CORRIDOR LIGHTS. (CKT L-12 PER RECORD DWGS.)

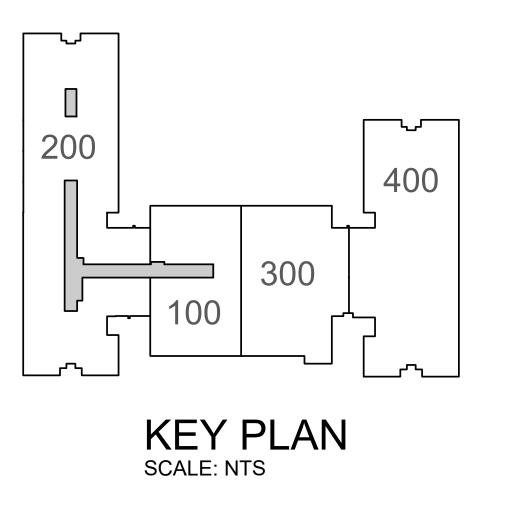
EC SHALL PROVIDE AND INSTALL A 120V CKT FOR THE NEW MOTORIZED DAMPER ON THE OA DUCT AT THE UNIT AND CONDUIT FOR A WALL MOUNTED C02 SENSOR IN THE ROOM ASSOCIATED

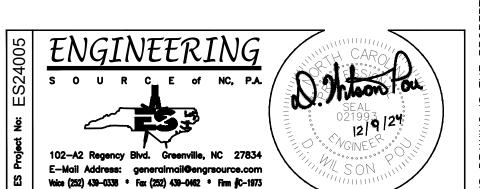
WITH THE UNIT. LOCATE SENSOR NEXT TO T&H SENSOR.

INSTALL NEW HYDRONIC UNIT IN PLACE OF EXISTING DX AIR COOLED SPLIT SYSTEM REMOVED. PROVIDE NEW HYDRONIC SUPPLY & RETURN PIPING BACK TO MAINS WITH ASSOCIATED COIL TRIM



201.1 100 & 200 WING PLATFORM ELECTRICAL PLAN SCALE: 1/8" = 1'-0"





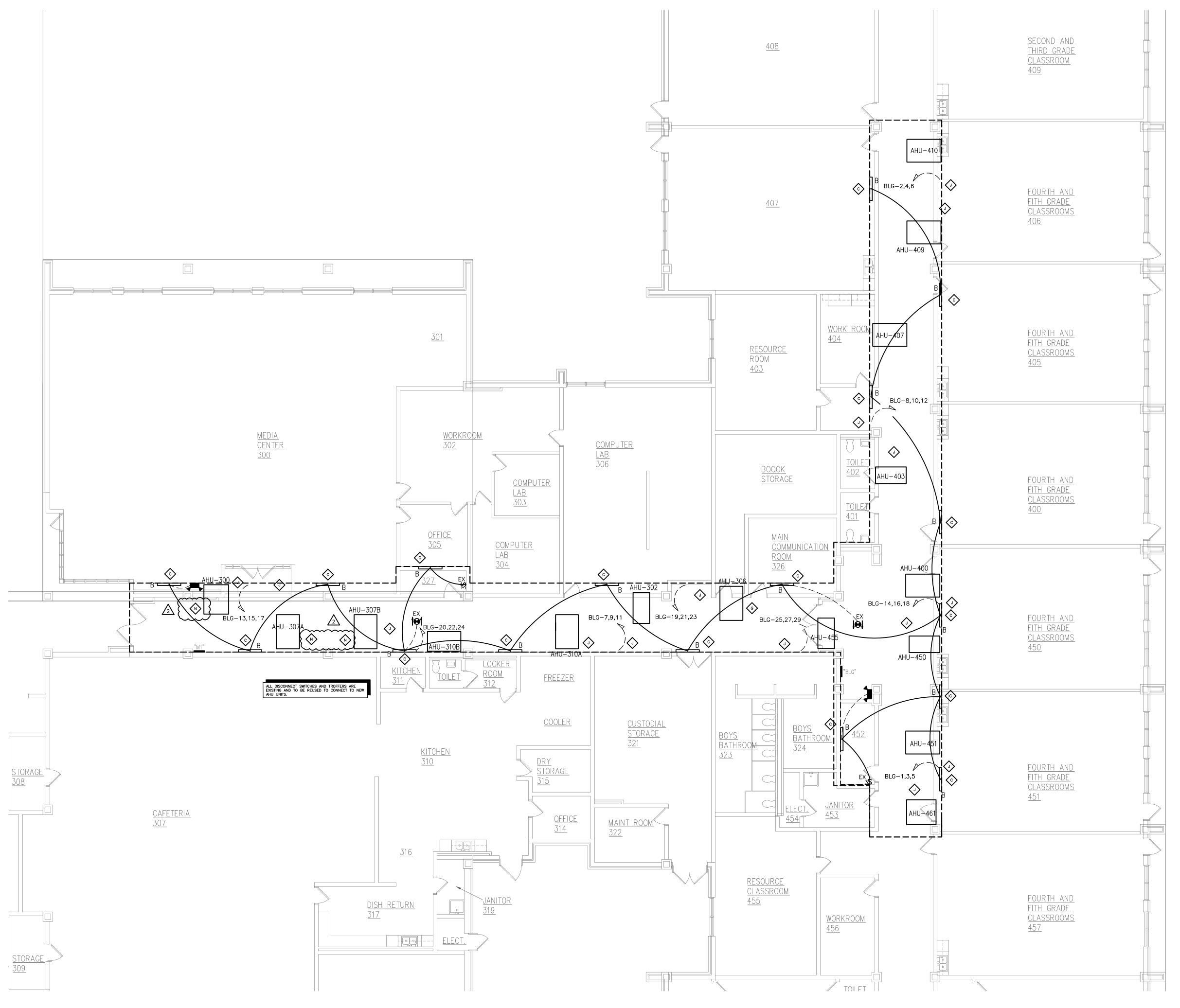
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Date:
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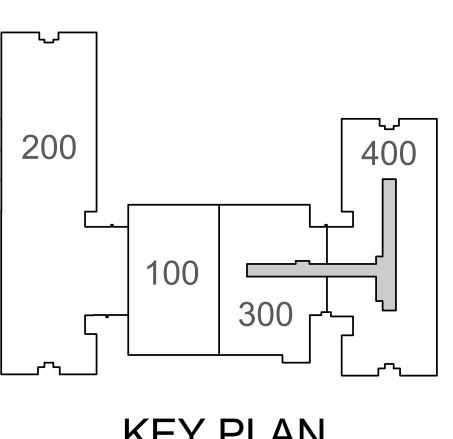
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- TIE EXISTING OA DUCT WHERE PRE-CONDITIONING UNIT WAS REMOVED INTO NEW AHU MIXING BOX OR RETURN AIR DUCT IF IT DOESN'T HAVE A MIXING BOX. INSTALL DAMPERS FOR AIR BALANCE IF MIXING BOX IS NOT PRESENT.
- REPLACE CEILING TILES IN THIS AREA AFTER NEW CHILLED WATER PIPING IS INSTALLED, INSULATED, INSPECTED AND ACCEPTED. INSTALL NEW LIGHTS IN GRID AND TIE BACK TO LOCAL POWER & CONTROL CIRCUITS AS INDICATED.
- INSTALL NEW FLUORESCENT LIGHTS IN THIS AREA AS INDICATED.
 CONNECT BACK TO EXISTING POWER AND CONTROL WIRING AS SHOWN. MODIFY SWITCH-LEG AS NECESSARY. REMOVE ANY TEMPORARY LIGHTS THAT WERE INSTALLED ONCE NEW LIGHTS ARE INSTALLED AND FUNCTIONING.
- INSTALL NEW PUMP AND ASSOCIATED PUMP TRIM BACK TO EXISTING SUPPLY AND RETURN PIPING DROPS MAINTAINED FOR RECONNECTION DURING DEMOLITION.
- RECONNECT NEW EQUIPMENT BACK TO EXISTING DISCONNECT SWITCH AND FEEDER MAINTAINED FOR REUSE. LABEL PANEL DIRECTORY WITH NEW EQUIPMENT ID AS APPROPRIATE
- SEQUENTIALLY INSTALL NEW AIR HANDLERS ACCORDING TO SCHEDULE DEVELOPED WITH OWNER, REUSE EXISTING MAINTENANCE PAD WHERE POSSIBLE. EXPAND OR INSTALL NEW PADS AS REQUIRED FOR NEW UNITS IN NEW LOCATIONS. CONNECT NEW UNIT BACK TO RETURN AND SUPPLY MAINTAINED FOR REUSE.
- INSTALL NEW HYDRONIC UNIT IN PLACE OF EXISTING DX AIR COOLED SPLIT SYSTEM REMOVED. PROVIDE NEW HYDRONIC SUPPLY & RETURN PIPING BACK TO MAINS WITH ASSOCIATED COIL TRIM
- REWORK EXISTING TRANE MODULAR AIR HANDLERS TO ADD A 2-ROW HEATING COIL IN THE REHEAT POSITION. MOVE THE EXIST. COOLING COIL AS NECESSARY TO MAKE ROOM FOR THE NEW COIL.
- INSTALL NEW DISCONNECT (BY MC) AND BACK TO EXISTING CIRCUIT MAINTAINED FOR REUSE. MC TO PROVIDE NEW FUSES AS REQUIRED TO MATCH NEW EQUIPMENT DATA PLATE. LABEL PANEL DIRECTORY
- WITH NEW AHU NUMBER AS NECESSARY. INSTALL NEW INSULATION ON ALL EXISTING HYDRONIC PIPING THAT HAD INSULATION REMOVED AND HAD EXISTING PIPE PREPARED FOR HAD INSULATION REMOVED AND HAD EXISTING PIPE PREPARED FOR NEW INSULATION. COLD/CHILLED WATER PIPING MUST BE INSULATED
- DURING ALL COOLING SEASONS TO PREVENT SWEATING. INSTALL NEW ELECTRIC UNIT HEATER AS INDICATED.
- REMOVE EXISTING RECESSED CAN LIGHTS IN THIS AREA, MAINTAIN POWER AND CONTROL TO ALL UP AND DOWN STREAM LIGHTING TO REMAIN. TIE NEW LAY-IN LIGHTS TO UNSWITCHED LEG OF EXISTING CORRIDOR LIGHTS. (CKT L-12 PER RECORD DWGS.)
- EC SHALL PROVIDE AND INSTALL A 120V CKT FOR THE NEW MOTORIZED DAMPER ON THE OA DUCT AT THE UNIT AND CONDUIT FOR A WALL MOUNTED CO2 SENSOR IN THE ROOM ASSOCIATED WITH THE UNIT. LOCATE SENSOR NEXT TO T&H SENSOR.



401.1 300 & 400 WING PLATFORM ELECTRICAL PLAN SCALE: 1/8" = 1'-0"



KEY PLAN SCALE: NTS

