



Alamance-Burlington School System  
Student Centered, Future Focused!

# WESTERN MIDDLE HVAC RENOVATIONS

**2100 ELDON DR.  
ELON, NC 27244**

**05.03.2023  
22-043**

## LIST OF DRAWINGS

### ARCHITECTURAL

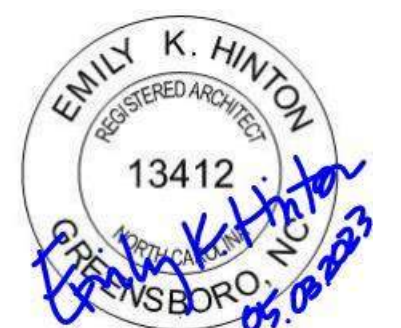
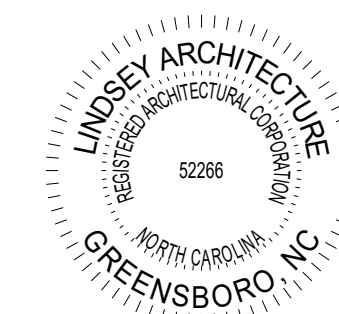
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**2018 APPENDIX B  
BUILDING CODE SUMMARY  
FOR ALL COMMERCIAL PROJECTS  
(EXCEPT 1 AND 2 FAMILY DWELLINGS AND TOWNHOUSES)**

Name of Project: Western Middle HVAC Renovations  
Address: 2100 Eldon Drive, Elon Zip Code: 27244

Owner or Authorized Agent: Jimmy Russell Phone #: 336-438-4000  
Address: 1712 Vaughn Road, Burlington, NC 27217 Email: jimmy.russell@abss.k12.nc.us

Owned By:  City / County  Private  State  
Code Enforcement Jurisdiction: City: \_\_\_\_\_ County: Alamance State: \_\_\_\_\_

**LEAD DESIGN PROFESSIONAL**

Designer	Firm	Name	License#	Telephone#	Email
Architectural	<u>Lindsey Architecture</u>	<u>Emily Hinton</u>	<u>13412</u>	<u>336-617-4402</u>	<u>emily@lindseyarch.com</u>
Civil					
Electrical	<u>Optima Engineering</u>	<u>Zane Kuseybi</u>	<u>17308</u>	<u>704-338-1292</u>	<u>zkuseybi@optimaengineering.com</u>
Fire Alarm					
Plumbing					
Mechanical	<u>Systems Contractors</u>	<u>Ronald Pitts</u>	<u>32727</u>	<u>336-763-8976</u>	<u>rpitts@systemscontractors.com</u>
Sprinkler-Standpipe					
Structural					
Retaining Walls >5' High					
Other					

2018 NC BUILDING CODE:  New Building  Shell/Core  1st Time Interior Completions  
 Addition  Phased Construction (Shell/Core)  Renovation

2018 NC EXISTING BUILDING CODE:  Prescriptive  Alteration Level I  Historic Property  
 Repair  Alteration Level II  Change of Use  
 Chapter 14  Alteration Level III

Constructed: \_\_\_\_\_ Original Use(s) (Ch.3): Educational  
Renovated: \_\_\_\_\_ Proposed Use(s) (Ch.3): No Change

Risk Category (Table 1604.5): Current:  I  II  III  IV Proposed:  I  II  III  IV

**BASIC BUILDING DATA**  EXISTING TO REMAIN

Construction Type:  I-A  II-A  III-A  IV  V-A  
(check all that apply)  I-B  II-B  III-B  V-B

Sprinklers:  No  Partial  NFPA 13  NFPA 13R  NFPA 13D

Standpipes:  No Class  I  II  III  Wet  Dry

Primary Fire District:  No  Yes Flood Hazard Area:  No  Yes

Special Inspections Required:  No  Yes

Gross Building Area Table:

Floor	Existing (sq. ft.)	New (sq. ft.)	Sub-Total
6th Floor			
5th Floor			
4th Floor			
3rd Floor			
2nd Floor			
Mezzanine			
1st Floor			
Basement			
Total			

**ALLOWABLE AREA**  EXISTING TO REMAIN

Primary Occupancy:  
 Assembly  A-1  A-2  A-3  A-4  A-5  
 Business  
 Educational  
 Factory  F-1 Moderate  F-2  
 Hazardous  H-1 Detonate  H-2 Deflagrate  H-3 Combust  H-4 Health  H-5 HPM  
 Institutional  I-1  I-2  I-3  I-4  
I-1 Use Condition  1  2  
I-2 Use Condition  1  2  
I-3 Use Condition  1  2  3  4  5  
I-4   
Mercantile   
Residential  R-1  R-2  R-3  R-4  
Storage  S-1 Moderate  S-2 Low  High Piled  
 Parking Garage  Open  Enclosed  Repair Garage  
Utility and Miscellaneous

Accessory Occupancy Classification(S): A-3  
Incidental Uses (Table 509):

- This separation is not exempt as a Non-Separated Use (see exceptions).  
 Furnace room where any piece of equipment is over 400,000 Btu per hour input  
 Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower  
 Refrigerant machine room  
 Hydrogen fuel gas rooms, not classified as Group H  
 Incinerator rooms  
 Paint shops, not classified as Group H, located in occupancies other than Group F  
 Group E occupancies, laboratories and vocational shops not classified as Group H  
 Ambulatory care facilities, laboratories not classified as Group H  
 Laundry rooms over 100 square feet  
 Group I-2, laundry rooms over 100 square feet  
 Group I-2, laundries equal to or less than 100 square feet  
 Group I-2, commercial kitchens  
 Group I-2, rooms or spaces that contain fuel-fired heating equipment  
 Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces  
 Group I-2, physical plant maintenance shops  
 In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater  
 In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet  
 Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptible power supplies  
 Fuel storage rooms in public schools and boiler rooms in public schools  
 Storage rooms underneath grandstands or bleacher seats containing combustible or flammable materials

Special Uses:  402  403  404  405  406  407  408  409  410  
 411  412  413  414  415  416  417  418  419  420  
 421  422  423  424  425  426  427  428  429  430

Special Provisions:  510.2  510.3  510.4  510.6  510.7  510.8  510.9

Mixed Occupancy:  No  Yes Separation: \_\_\_\_\_ Hr. Exception: \_\_\_\_\_  
 Non-Separated Use (508.3)  
 Separated Use (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

Story No.	Description and use	(A) Bldg Area Per Story (Actual)	(B) Table 506.2 <sup>4</sup> Area	(C) Area for Frontage Increase <sup>1,5</sup>	(D) Allowable Area Per Story or Unlimited <sup>2,3</sup>

- Frontage area increase from Section 506.2 are computed thus:
  - Perimeter which fronts a public way or open space having 20 feet minimum width = \_\_\_\_\_ (F)
  - Total Building Perimeter = \_\_\_\_\_ (P)
  - Ratio (F/P) = \_\_\_\_\_ (F/P)
  - W = Minimum width of public way = \_\_\_\_\_ (W)
  - Percent of frontage increase  $I_f = 100(F/P - 0.25) \times W/30 =$  \_\_\_\_\_ (%)
- Unlimited area applicable under conditions of Section 507.
- Maximum Building Area = total number of stories in the building x D (maximum 3 stories) (506.2).
- The maximum area of open parking garages must comply with Table 406.5.4. The maximum area of air traffic control towers must comply with Table 412.3.1.
- Frontage increase is based on the unsprinklered area value in Table 506.2.

**ALLOWABLE HEIGHT**  EXISTING TO REMAIN

	Allowable	Shown on Plans	Code Reference
Building Height in Feet (Table 504.3)	--	--	--
Building Height in Stories (Table 504.4)	--	--	--

<sup>1</sup> Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.  
<sup>2</sup> The maximum height of air traffic control towers must comply with Table 412.3.1  
<sup>3</sup> The maximum height of open parking garages must comply with Table 406.5.4.

**FIRE PROTECTION REQUIREMENTS**  EXISTING TO REMAIN - EXISTING RATINGS SHALL BE MAINTAINED

Building Elements	Fire Separation Distance (Feet)	Rating		Detail # and Sheet #	Design # for rated assembly	Sheet # for rated penetration	Sheet # for rated joints
		Req'd	Provided (w/ + reduction)				
Structural Frame, including columns, girders, trusses	--	--	--	--	--	--	--
Bearing Walls							
Exterior							
North	--	--	--	--	--	--	--
East	--	--	--	--	--	--	--
West	--	--	--	--	--	--	--
South	--	--	--	--	--	--	--
Interior	--	--	--	--	--	--	--
Nonbearing Walls and Partitions							
Exterior Walls							
North	--	--	--	--	--	--	--
East	--	--	--	--	--	--	--
West	--	--	--	--	--	--	--
South	--	--	--	--	--	--	--
Interior walls and partitions	--	--	--	--	--	--	--
Floor Construction including supporting beams and joists	--	--	--	--	--	--	--
Floor Ceiling Assembly	--	--	--	--	--	--	--
Columns Supporting Floors	--	--	--	--	--	--	--
Roof Construction, including supporting beams and joists	--	--	--	--	--	--	--
Roof Ceiling Assembly	--	--	--	--	--	--	--
Columns Supporting Roof	--	--	--	--	--	--	--
Shaft Enclosures - Exit	--	--	--	--	--	--	--
Shaft Enclosures - Other	--	--	--	--	--	--	--
Corridor Separation	--	--	--	--	--	--	--
Occupancy/Fire Barrier Separation	--	--	--	--	--	--	--
Party/Fire Wall Separation	--	--	--	--	--	--	--
Smoke Barrier Separation	--	--	--	--	--	--	--
Smoke Partition	--	--	--	--	--	--	--
Tenant Dwelling Unit/Sleeping Unit Separation	--	--	--	--	--	--	--
Incidental Use Separation	--	--	--	--	--	--	--

\* Indicates section number permitting reduction

**PERCENTAGE OF WALL OPENING CALCULATIONS**  EXISTING TO REMAIN

Fire Separation Distance (Feet) From Property Lines	Degree of Openings Protection (Table 705.8)	Allowable Area (%)	Actual Shown on Plans (%)
--	--	--	--
--	--	--	--

**LIFE SAFETY SYSTEMS REQUIREMENTS**  EXISTING TO REMAIN

Emergency Lighting:  No  Yes  
Exit Signs:  No  Yes  
Fire Alarm:  No  Yes  
Smoke Detection Systems:  No  Yes  Partial  
Carbon Monoxide Detection:  No  Yes

**LIFE SAFETY PLAN REQUIREMENTS**  NO CHANGE TO LIFE SAFETY/EGRESS

- Life Safety Plan Sheet #: \_\_\_\_\_
- Fire and/or smoke rated wall locations (Chapter 7)
  - Assumed and real property line locations (if not on the site plan)
  - Exterior wall opening area with respect to distance to assumed property lines (705.8)
  - Occupancy Use for each area as it relates to occupant load calculation (Table 1004.1.2)
  - Occupant loads for each area
  - Exit sign locations
  - Exit access travel distances (1017)
  - Common path of travel distances (Table 1006.2.1 & 1006.3.2(1))
  - Dead end lengths (1020.4)
  - Clear exit widths for each exit door
  - Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
  - Actual occupant load for each exit door
  - A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
  - Location of doors with panic hardware (1010.1.10)
  - Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
  - Location of doors with electromagnetic egress locks (1010.1.9.9)
  - Location of doors equipped with hold-open devices
  - Location of doors with emergency escape windows (1030)
  - The square footage of each fire area (202)
  - The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
  - Note any code exceptions or table notes that may have been utilized regarding the items above

**ACCESSIBLE DWELLING UNITS (SECTION 1107)**  NOT APPLICABLE

Total Units	Accessible Units Required	Accessible Units Provided	Type A Units Required	Type A Units Provided	Type B Units Required	Type B Units Provided	Total Accessible Units Provided
--	--	--	--	--	--	--	--

**ACCESSIBLE PARKING (SECTION 1106)**  EXISTING TO REMAIN

Lot or Parking Area	Total # of Parking Spaces		# of Accessible Spaces Provided			Total # Accessible Provided
	Required	Provided	Regular with 5' Access Aisle	Van Spaces With 13' Access Aisle	8' Access Aisle	
--	--	--	--	--	--	--
--	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

**PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)**  EXISTING TO REMAIN

Use	Water Closets			Urinals	Lavatories			Showers / Tubs	Drinking Fountains	
	Male	Female	Unisex		Male	Female	Unisex		Regular	Accessible
Space Existing	--	--	--	--	--	--	--	--	--	--
New	--	--	--	--	--	--	--	--	--	--
Required	--	--	--	--	--	--	--	--	--	--

**SPECIAL APPROVALS**

Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, etc., describe below)

**ENERGY SUMMARY**

**ENERGY REQUIREMENTS**

The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code:  (If checked, the remainder of this section is not applicable.)

Exempt Building:  Provide code or statutory reference: \_\_\_\_\_

Climate Zone:  3A  4A  5A

Method of Compliance:  
Energy Code:  Performance  Prescriptive (SECTION C503)  
ASHRAE 90.1:  Performance  Prescriptive  
Other:  Performance (specify source) \_\_\_\_\_

**THERMAL ENVELOPE: (Prescriptive method only)**

Roof/Ceiling Assembly (each Assembly)  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_  
Skylights in each assembly:  
U-Value of skylight: \_\_\_\_\_  
Total square footage of skylights in each assembly: \_\_\_\_\_

Exterior Walls (each assembly)  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_  
Openings (windows or doors with glazing) \_\_\_\_\_  
U-Value of assembly: \_\_\_\_\_  
Solar heat gain coefficient \_\_\_\_\_  
Projection factor: \_\_\_\_\_  
Door R-Values: \_\_\_\_\_

Walls below grade (each assembly)  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_

Floors over unconditioned space (each assembly)  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_

Floors slab on grade  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_  
Horizontal/vertical requirement: \_\_\_\_\_  
Slab heated: \_\_\_\_\_

**STRUCTURAL DESIGN** (NOT APPLICABLE)

**MECHANICAL** (REFER TO MECHANICAL DRAWINGS)

**ELECTRICAL** (REFER TO ELECTRICAL DRAWINGS)



**WESTERN MIDDLE HVAC  
RENOVATIONS**  
2100 ELDON DR.  
ELON, NC 27244

MK DATE DESCRIPTION REVISIONS

**BUILDING CODE SUMMARY**

DATE 05.03.2023  
DRAWN BY ERH  
CHECK BY EKH  
JOB NO. 22-043  
SHEET

**G.O.2**

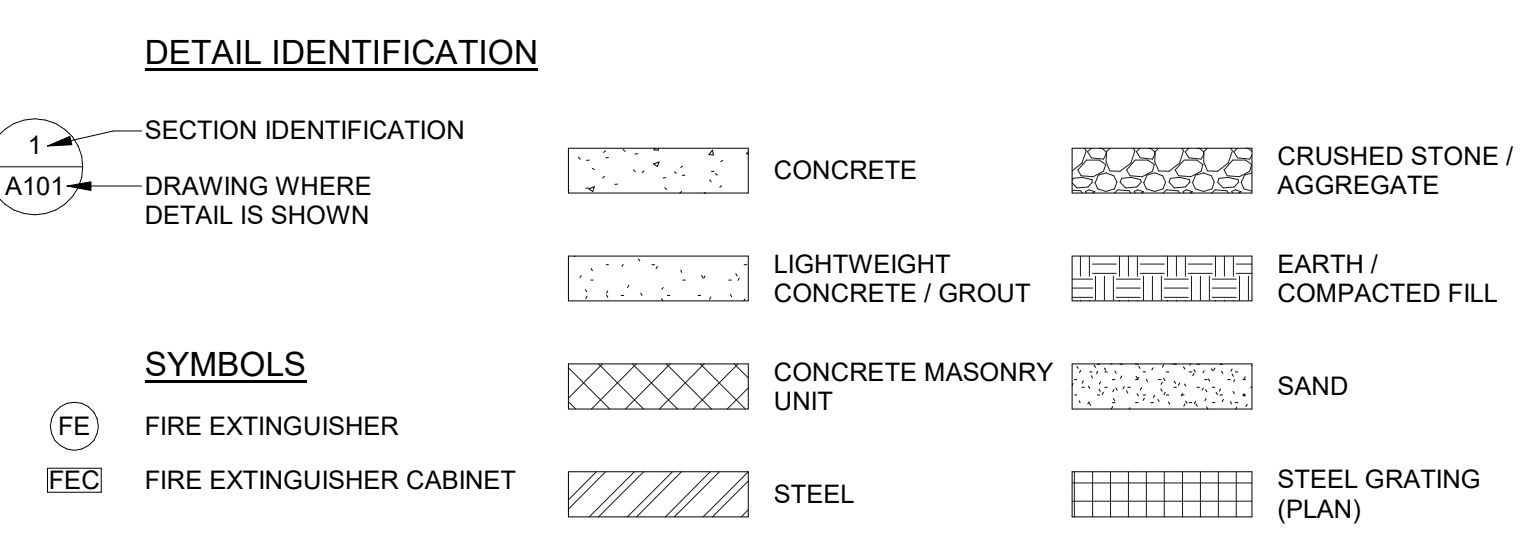
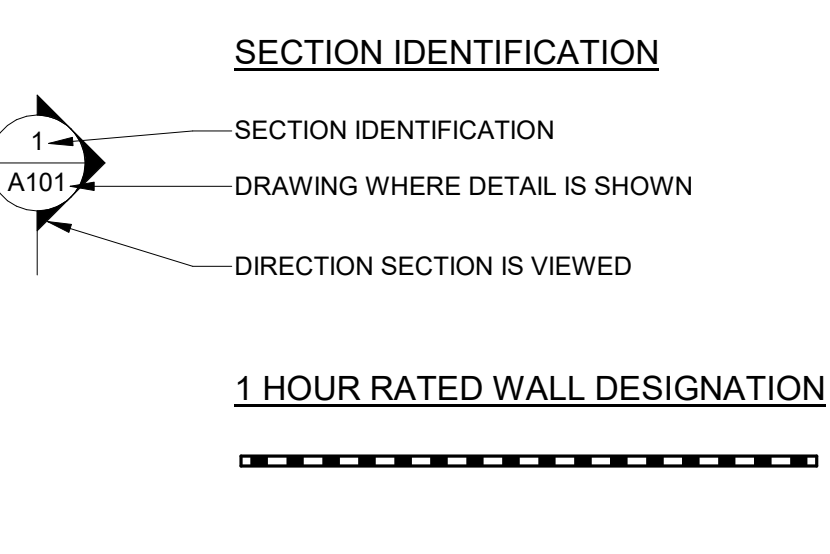
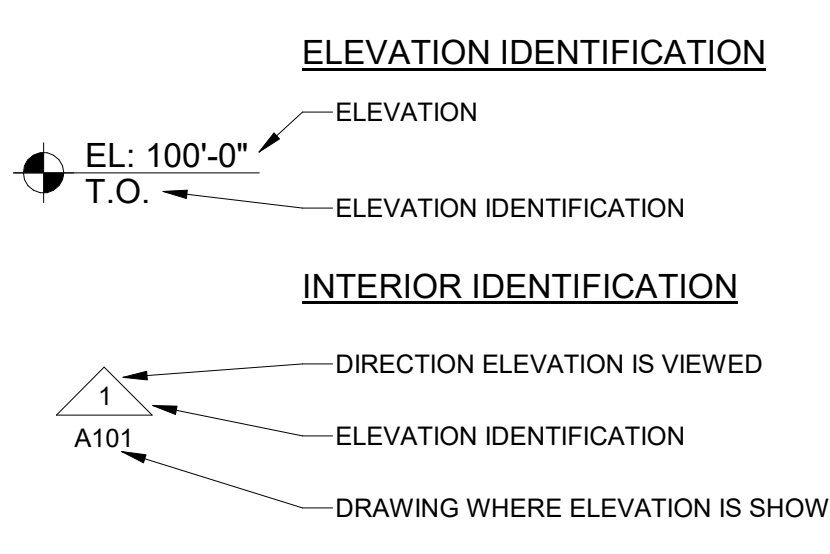
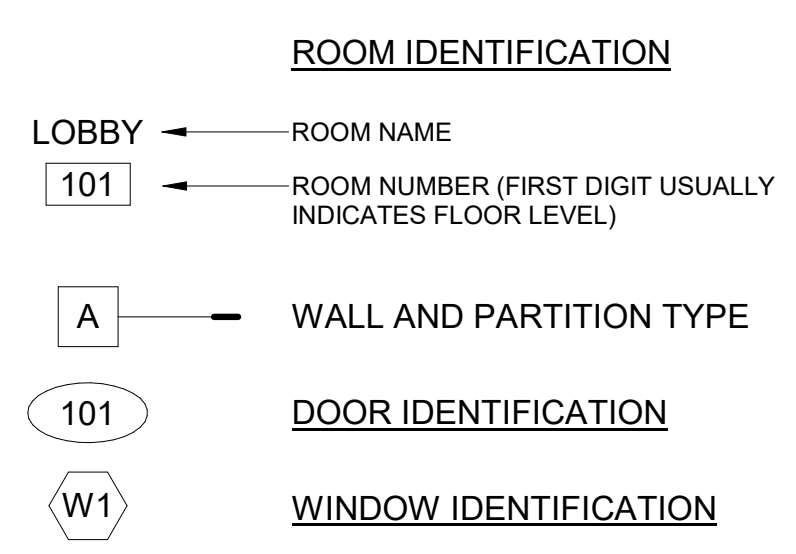
ABV. ABOVE	AD. ABOVE FINISHED FLOOR	AD. AC. AC. AC. PL. ADD. ADH. ADJ. ADJT. AGG. AVC. ALT. ALUM. A.B. ANOD. APPX. ARGH. A.D. ASB. ASPH. A.T. AUTO.	F.O.C. F.O.M. F.O.S. F.D. FIN. F.F. F.A. F.C. F.E. F.E.C. F.H.C. F.P. F.R.T. FLG. FLX. FLR. F.D. F.LOUR. F.JT. FT. FTG. FOUND. FR. FRA. F.S. FUR. FUT.	FACE BRICK FACE OF CONCRETE FACE OF FINISH FACE OF MASONRY FACE OF STUDS FIBERGLASS FIELD DETERMINE FINISH(ED) FINISH FLOOR FIRE ALARM FIRE CODE FIRE EXTINGUISHER FIRE EXTINGUISHER CAB. FIRE HOSE CABINET FIREPLACE FIREPROOF FIRE-RETARDANT FLASHING FLEXIBLE FLOOR(ING) FLOOR DRAIN FLUORESCENT FLUSH JOINT FOOT (FEET) FOOTING FOUNDATION FRAME(D), (ING) FRESH AIR FULL SIZE FURFUR(ING) FUTURE	POLY ISO POLYMERIC ISOMER PR. PAINT(ED) P.B. PANIC BAR PAR. PARALLEL P.B.D. PARTICLE BOARD PTN. PARTITION PAVEMENT PEDESTAL PERFORATE(D) PERIM. PERIMETER PLASTER P*LAM. PLASTIC LAMINATE PL. PLATE PLY. PLYWOOD PT. POINT P.V.C. POLYVINYL CHLORIDE P.C.F. POUNDS PER CUBIC FOOT P.L.F.T. POUNDS PER LINEAL FOOT P.S.F. POUNDS PER SQUARE FOOT P.S.I. POUNDS PER SQUARE INCH PC. PRE CAST PFB. PREFABRICATED(D) PFN. PRE FINISHED P.L. PROPERTY LINE Q.T. QUARRY TILE QTY. QUANTITY	RAD. RADIATION R. RADIUS R.W.L. RAINWATER LEADER REF. REFERENCE RFL. REFLECT(ED), (IVE), (OR) REFR. REFRIGERATOR REG. REGISTER REC. REINFORCED CONCRETE PIPE REM. REMOVE REQ'D. REQUIRED RES. RESILIENT R.A. RETURN AIR REV. REVISION(S) R.H. RIGHT HAND R.O.W. RIGHT OF WAY R. RISER R.D. ROOF DRAIN RF.H. ROOF HATCH RFG. ROOFING R.M. ROOM R.O. ROUGH OPENING	S.F. GL. SAFETY GLASS SCHED. SCHEDULE SECT. SECTION SHTG. SHEATHING SHT. SHEET SHELV. SHELVING SIM. SIMILAR SKYLT. SKYLIGHT SL. SLEEVE S.C. SOLID CORE SP. SOUNDPROOF SPK. SPEAKER SPEC. SPECIFICATION(S) SQ. SQUARE S.F. SQUARE FOOT (FEET) S.S. STAINLESS STEEL STD. STANDARD STA. STATION STL. STEEL STOR. STORAGE S.D. STORM DRAIN STR. STRUCTURE STR.L. STRUCTURAL S.C.T. STRUCTURAL CLAY TILE SUSP. SUSPENDED SYM. SYMMETRY (ICAL) SYN. SYNTHETIC SYS. SYSTEM	TK.BD. TACK BOARD TKS. TACK STRIP TEL. TELEPHONE T.V. TELEVISION TEMP. TEMPORARY, TEMPERED T.C. TERRA COTTA TZ. TERRAZZO THK. THICKNESS THR. THRESHOLD T.PTN. TOILET PARTITION T&G. TONGUE AND GROOVE T.O.F. TOP OF FOUNDATION T.O.M. TOP OF MASONRY T.O.SL. TOP OF SLAB T.O.S. TOP OF STEEL T.O.W. TOP OF WALL TPO. THERMOPLASTIC POLYOLEFIN T.B. TOWEL BAR TREAD TYP. TYPICAL	UC. UNDERCUT UNF. UNFINISHED U.N.O. UNLESS NOTED OTHERWISE U.S. UNDERSIDE V.B. VAPOR BARRIER VER. VERIFY VERT. VERTICAL V.G. VERTICAL GRAIN VIN. VINYL V.C.T. VINYL COMPOSITION TILE V.B. VINYL BASE V.T. VINYL TILE V.W.C. VINYL WALL COVERING V.I.F. VERIFY IN FIELD WSCT. WAINSCOT W.C. WATER CLOSET WP. WATERPROOFING W.R. WATER RESISTANT W.S. WATER STOP WT. WEIGHT W.W.F. WELDED WIRE FABRIC W/ WITH W/O WITHOUT WDW. WINDOW W.G. WIRED GLASS WD. WOOD W.B. WOOD BASE W.PT. WORKING POINT
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**1** ABBREVIATIONS

G0.3

**2** GENERAL NOTES

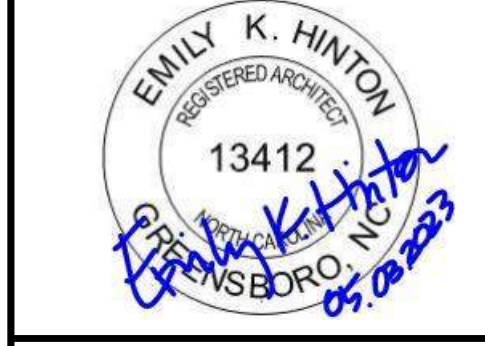
G0.3 SCALE: 12" = 1'-0"



**3** SYMBOLS

G0.3 SCALE: 1/8" = 1'-0"

5. DEMOLITION AND EXISTING NOTES:
- i) REFER TO OTHER DEMOLITION DRAWINGS INCLUDED IN THE DRAWING SET FOR ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH CURRENT APPLICABLE BUILDING CODE WITH LOCAL AMENDMENTS AND WITH ALL OTHER CODES, ORDINANCES AND REQUIREMENTS. IF THERE IS CONFLICT THE MORE STRINGENT SHALL BE USED.
- ii) THE CONTRACTOR SHALL REMOVE ALL ANCHORS, FASTENERS, ADHESIVES, HANGERS, REINFORCING AND OTHER ASSOCIATED WORK RELATED TO REFERENCED DEMOLITION NOTES. IF ITEMS PROTRUDING FROM WORK TO REMAIN ARE IN SURFACES TO BE COVERED, ITEMS MAY BE CUT OFF FLUSH WITH EXISTING SURFACE. OTHERWISE, ITEM MUST BE COMPLETELY REMOVED AND SURFACE REPAIRED TO MATCH ADJACENT WORK.
- iii) IF DAMAGE OCCURS TO EXISTING WORK, CONTRACTOR SHALL REPAIR AND REPLACE EXISTING WORK TO MATCH IN-PLACE WORK. EXTENT OF REPAIR WILL BE DETERMINED BY ARCHITECT AND/OR OWNER.
- iv) DEMOLITION SHALL BE KEPT TO A MINIMUM DISRUPTION OF EXISTING BUILDING OPERATIONS. PROVIDE DUST PARTITIONS AND SAFETY BARRIERS TO PROTECT EXISTING FINISHED AREAS IN BUILDING FROM CONSTRUCTION DUST AND NOISE.
- v) THE DEMOLITION WORK INCLUDES ALL THE WORK REQUIRED TO PREPARE SURFACES TO RECEIVE NEW FINISHES.
- vi) CONTRACTORS SHALL TAKE ALL POSSIBLE PRECAUTIONS AGAINST DAMAGING ANY EXISTING CONSTRUCTION AND EQUIPMENT THAT IS TO REMAIN. ALL DAMAGES CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AND AT NO COST TO THE OWNER. ALL REPAIR WORK SHALL BE TO THE COMPLETE SATISFACTION OF THE OWNER.
- vii) REFER TO THE CONTRACT DOCUMENTS FOR LOCATIONS OF FIRE RATED ASSEMBLIES. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND CONFIRM LOCATION OF ALL FIRE RATED ASSEMBLIES. ALL FIRE RATED ASSEMBLIES REQUIRED TO BE DISTURBED TO DO THE WORK UNDER THIS CONTRACT SHALL BE REPLACED OR PATCHED WITH UL APPROVED ASSEMBLIES TO MATCH EXISTING AND TO MAINTAIN EXISTING ASSEMBLY FIRE RATING.



**WESTERN MIDDLE HVAC RENOVATIONS**  
 2100 ELDON DR.  
 ELON, NC 27244

MK	DATE	DESCRIPTION
		REVISIONS

**ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES**

DATE	05.03.2023
DRAWN BY	ERH
CHECK BY	EKH
JOB NO.	22-043
SHEET	

**G0.3**

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, and other Division 01 Specification Sections, apply to this Section.
1.2 SUMMARY
A. Section includes administrative and procedural requirements for quality assurance and quality control.
B. Testing and inspecting services are required to verify compliance with requirements specified or indicated.
1.3 DEFINITIONS
A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

1.4 CONFLICTING REQUIREMENTS
A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed.
1.5 REPORTS AND DOCUMENTS
A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections as required by all disciplines.

1.6 QUALITY ASSURANCE
A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.7 QUALITY CONTROL
A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility.
B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
C. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

3.2 REPAIR AND PROTECTION
A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
B. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.
END OF SECTION 014000

SECTION 017300 - EXECUTION

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, and other Division 01 Specification Sections, apply to this Section.
1.2 DEFINITIONS
A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.
1.3 QUALITY ASSURANCE
A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1.4 WARRANTY
A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations and with materials so as not to void existing warranties.
PART 2 - PRODUCTS
2.1 MATERIALS
A. General: Comply with requirements specified in other Sections.
B. In-Place Materials: Use materials for patching identical to in-place materials.
PART 3 - EXECUTION
3.1 EXAMINATION
A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed.

3.2 PREPARATION
A. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
B. Surface and Substrate Preparation: Comply with manufacturer's recommendations for preparation of substrates to receive subsequent work.
3.3 INSTALLATION
A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

3.4 CUTTING AND PATCHING
A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
B. Temporary Support: Provide temporary support of work to be cut.
C. Protection: Protect in-place construction during cutting and patching to prevent damage.
D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching with Owner prior to start of activities.

3.5 OWNER-INSTALLED PRODUCTS
A. Site Access: Provide access to Project site for Owner's construction personnel.
B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
C. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work.
3.6 PROTECTION OF INSTALLED CONSTRUCTION
A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Final Completion.
B. Comply with manufacturer's written instructions for temperature and relative humidity.
3.7 CORRECTION OF THE WORK
A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

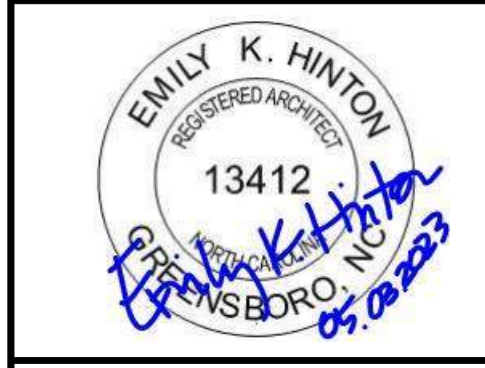
SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes: Demolition and removal of selected portions of building or structure.
1.2 DEFINITIONS
A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner.
C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

3.3 PROTECTION
A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary lighting throughout the construction area during demolition and construction.
3. Provide temporary signage throughout the work area as coordinated with the Owner.
4. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
5. Cover and protect furniture, furnishings, and equipment that have not been removed.

3.4 SELECTIVE DEMOLITION, GENERAL
A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Arrange to shut off utilities with utility companies and coordinate with the Owner. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch as required by the Owner's "Hot Work Permit".
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with the public using the building, roads, streets, walks, walkways, and other adjacent occupied and used facilities.
C. Removed and Salvaged Items:
1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.
D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
3.6 DISPOSAL OF DEMOLISHED MATERIALS
A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
B. Burning: Do not burn demolished materials.
3.7 CLEANING
A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
END OF SECTION 024119



WESTERN MIDDLE HVAC RENOVATIONS
2100 ELDON DR.
ELON, NC 27244

Table with 2 columns: MK, DATE, DESCRIPTION, REVISIONS

SPECIFICATIONS

Table with 2 columns: DATE, DRAWN BY, CHECK BY, JOB NO., SHEET

G.O.4

**NOTES**

1. ANY EXISTING CEILING-MOUNTED DEVICES IMPACTED BY HVAC INSTALLATION / CEILING REMOVAL SHALL BE RE-INSTALLED IN SAME LOCATION.

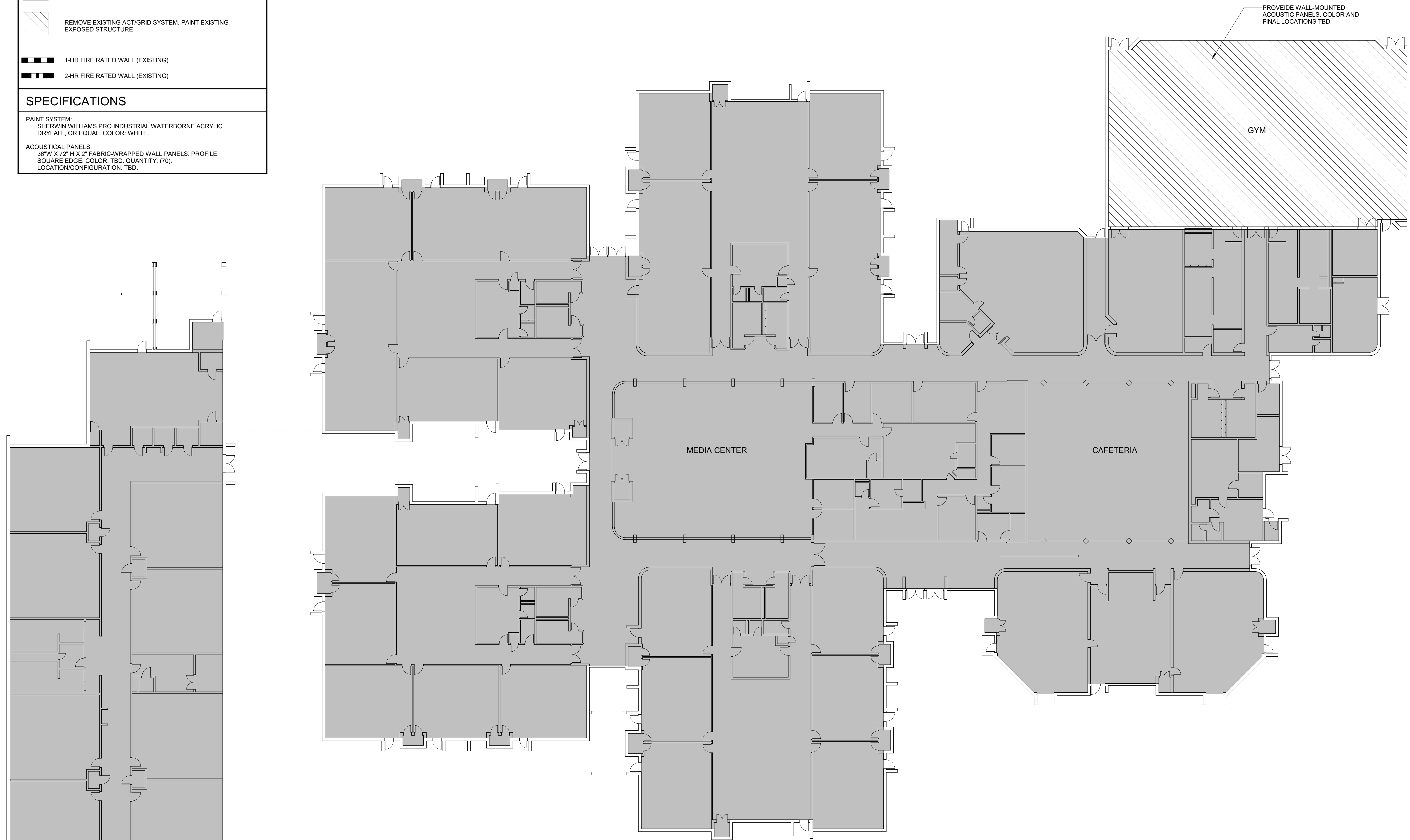
**COORDINATION PLAN LEGEND**

- NO ARCHITECTURAL WORK IN THIS AREA. SEE MECHANICAL DRAWINGS FOR EXTENT OF MECHANICAL WORK
- REMOVE EXISTING ACT/GRID SYSTEM. PAINT EXISTING EXPOSED STRUCTURE
- 1-HR FIRE RATED WALL (EXISTING)
- 2-HR FIRE RATED WALL (EXISTING)

**SPECIFICATIONS**

**PAINT SYSTEM:**  
SHERWIN WILLIAMS PRO INDUSTRIAL WATERBORNE ACRYLIC DRYFALL, OR EQUAL. COLOR: WHITE.

**ACOUSTICAL PANELS:**  
36" W X 72" H X 2" FABRIC-WRAPPED WALL PANELS. PROFILE: SQUARE EDGE. COLOR: TBD. QUANTITY: (70). LOCATION/CONFIGURATION: TBD.



**1** MAIN LEVEL ARCHITECTURAL COORDINATION PLAN  
A1.1 SCALE: 1/16" = 1'-0"



**WESTERN MIDDLE HVAC RENOVATIONS**  
2100 ELDON DR.  
ELON, NC 27244

MK	DATE	DESCRIPTION
		REVISIONS

**MAIN LEVEL ARCHITECTURAL COORDINATION PLAN**

DATE	05.03.2023
DRAWN BY	ERH
CHECK BY	EKH
JOB NO.	22-043
SHEET	

**A1.1**

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Modular Indoor Central-Station Air-Handling Units

- PART 1 - GENERAL
1.01 SUBMITTALS
A. No equipment shall be fabricated or delivered until the receipt of approved shop drawings from the Owner or Owner's approved representative.
B. AHU manufacturer shall provide the following information with each shop drawing...

PART 2 - PRODUCTS
2.01 GENERAL
A. Unit layout and configuration shall be as defined in project plans and schedule.

- 2.02 UNIT CASING
A. The entire air handler shall be constructed of galvanized steel. All doors shall have gasketing around full perimeter to prevent air leakage.
B. All panels shall be 2-inch double wall construction to facilitate cleaning of unit interior.
C. Unit floor shall be of sufficient strength to support 300-lb load during maintenance activities...

2.03 ACCESS DOORS
A. Access doors shall be 2-inch double-wall construction. Interior and exterior shall be of the same construction as the interior and exterior wall panels.

- 2.04 PRIMARY DRAIN PANS
A. The drain pan shall be designed in accordance with ASHRAE 62.1 being of sufficient size to collect all condensation produced from the coil and sloped in two planes, pitched toward drain connections, promoting positive drainage to eliminate stagnant water conditions when unit is installed, level and trapped per manufacturer's requirements.
2.05 SUPPLY FAN
A. Fan sections shall have a minimum of one hinged and latched access door located on the drive side of the unit to allow inspection and maintenance of the fan, motor, and drive components.

2.06 MOTORS AND DRIVES
A. All motors, and drives for belt drive fans, shall be factory-installed and run tested. Motors for belt driven fans shall be installed on a slide base to permit adjustment of belt tension.
B. Integral horsepower motors shall meet or exceed all NEMA Standards Publication MG 1 - 2006 requirements and comply with NEMA Premium efficiency levels when applicable.

- 2.07 COILS
A. Coils section header and panel shall be removable to allow for removal and replacement of coils without impacting the structural integrity of the unit.
B. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil.

- 2.08 FILTERS
A. Filter type, MERV rating, and arrangement shall be provided as defined in project plans and schedule.
2.09 FACTORY WIRING OF VFD'S AND STARTERS
A. In units provided with factory mounted and wired supply fan starter or VFD and DDC controls, the manufacturer shall provide a single point of power. Line-to-24v transformers shall be provided with sufficient VA to power the factory installed control points.

PART 3 - EXECUTION
3.01 SHIPPING
A. After loading the equipment for shipment, the AHU manufacturer shall contact the shipping contact on the order and provide the name of the carrier, description of equipment, order number, shipping point, and date of shipment.

- 3.02 FIELD EXAMINATION
A. The Mechanical Contractor shall verify that the mechanical room is ready to receive work and the opening dimensions are as indicated on the shop drawings and contract documents.
3.03 INSTALLATION
A. The Mechanical Contractor shall be responsible to coordinate ALL of his installation requirements with the Owner and the Owner's selected Mechanical Contractor to ensure that a complete installation for each unit is being provided.
3.04 QUALITY ASSURANCE
A. Unit shall be rated in accordance with AHRI (Air-Conditioning, Heating and Refrigeration Institute) Standard 550/590, latest edition (U.S.A.) and all units shall be in compliance with ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) 90.1.2007 and ASHRAE 90.1.2010.

Outdoor Air-Cooled Liquid Chillers
Part 1 - General
1.01 SYSTEM DESCRIPTION
Microprocessor controlled, air-cooled liquid chiller for outdoor installation, utilizing scroll compressors, & low sound fans.

- All fans are controlled with variable speed fan drive motors.
1.02 QUALITY ASSURANCE
A. Unit shall be rated in accordance with AHRI (Air-Conditioning, Heating and Refrigeration Institute) Standard 550/590, latest edition (U.S.A.) and all units shall be in compliance with ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) 90.1.2007 and ASHRAE 90.1.2010.
B. Unit construction shall comply with ASHRAE 15 Safety Code, UL (Underwriters Laboratories) latest edition, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).
C. The management system governing the manufacture of this product is ISO 9001:2015 certified.

Part 2 - Products
2.01 EQUIPMENT
A. General:
Factory assembled, single-piece air-cooled liquid chiller. Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-410A), and special features required prior to field start-up.

- B. Materials of Construction:
1. The base rail is industrial-quality, 7ga, zinc-dipped, galvanized frame (with Magni-coated screws).
2. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.
3. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1 mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating 1.4 per ASTM D1654) on either side of the scribe line.
C. Fans:
1. Condenser fans shall be variable frequency drive controlled, 9-blade airfoil cross-section, reinforced polymer construction, shrouded axial-type, and shall be statically and dynamically balanced with inherent corrosion resistance.
2. Fans shall be protected by coated steel wire safety guards.
D. Compressor/Compressor Assembly:
1. Fully hermetic scroll type compressors.
2. Direct drive, 3500 rpm (60 Hz), protected by motor temperature sensors, suction gas cooled motor.
3. External vibration isolation rubber-in-shear.
4. Each compressor shall be equipped with crankcase heaters to minimize oil dilution.

- E. Cooler:
1. Shell-and-tube type, direct expansion.
2. Tubes shall be internally enhanced seamless-copper type rolled into tube sheets.
3. Shell be equipped with Victaulic-type water connections.
4. Shell shall be insulated with 3/4-in. (19-mm) PVC foam (closed-cell) with a maximum K factor of 0.28.
5. Design shall incorporate a minimum of 2 independent direct-expansion refrigerant circuits.
6. Cooler shall be tested and stamped in accordance with ASME Code for a refrigerant working side pressure of 445 psig (3068 kPa). Cooler shall have a maximum water-side pressure of 300 psig (2068 kPa).
7. Cooler shall be provided with a factory-installed flow switch and heater.
F. Condenser:
1. Coil shall be air-cooled Novatran® heat exchanger technology with microchannel (MCHX) coils and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds.
2. Tubes shall be cleaned, dehydrated, and sealed.
G. Refrigeration Components:
Refrigerant circuit components shall include replaceable-core filter drier, moisture indicating sight glass, electronic expansion device, discharge service valve and liquid line service valves, and complete operating charge of both refrigerant R-410A and compressor oil.
H. Controls, Safeties, and Diagnostics:
1. Unit controls shall include the following minimum components:
a. Microprocessor with non-volatile memory. Battery backup system shall not be accepted.
b. Separate terminal block for power and controls.
c. Control transformer to serve all controllers, relays, and control components.
d. ON/OFF control switch.
e. Replaceable solid-state controllers.
f. Pressure sensors shall be installed to measure suction and discharge pressure. Thermistors shall be installed to measure cooler entering and leaving fluid temperatures.
2. Unit controls shall include the following functions:
a. Automatic circuit lead/lag.
b. Hermetic scroll compressors are maintenance free and protected by an auto-adaptive control that minimizes compressor wear.
c. Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature with temperature set point accuracy to 0.1°F (0.06°C).
d. Limiting the chilled fluid temperature pull-down rate at start-up to an adjustable range of 0.2°F to 2°F (0.11°C to 1.1°C) per minute to prevent excessive demand spikes at start-up.
e. Seven-day time schedule.
f. Leaving chilled fluid temperature reset from return fluid and outside air temperature.
g. Chilled water pump start/stop control and primary/standby sequencing to ensure equal pump run time.
h. Dual chiller control for parallel chiller applications without addition of hardware modules and control panels (additional thermostats and wells are required).
i. Timed maintenance scheduling to signal maintenance activities for pumps, strainer maintenance and user-defined maintenance activities.
j. Low ambient protection to energize cooler or hydronic system heaters.
k. Periodic pump start to ensure pump seals are properly maintained during off-season periods.
l. Single step demand limit control activated by remote contact closure.
m. Nighttime sound mode to reduce the sound of the machine by a user-defined schedule.
3. Diagnostics:
a. The control panel shall include, as standard, a scrolling marquee display capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display with time and date stamp.

- 4. Safeties:
a. Unit shall be equipped with thermostats and all necessary components in conjunction with the control system to provide the unit with the following protections:
1) Loss of refrigerant charge.
2) Reverse rotation.
3) Low chilled fluid temperature.
4) Thermal overload.
5) High pressure.
6) Electrical overload.
b. Condenser fan and factory pump motors shall have external overcurrent protection.
I. Operating Characteristics:
1. Unit shall be capable of starting and running at outdoor ambient temperatures from -20°F to 125°F (0 to 52°C) for all sizes.
2. Unit shall be capable of starting up with 95°F (35°C) entering fluid temperature to the cooler.
J. Motors:
Condenser-fan motors shall be totally enclosed single-speed, 3-phase type with permanently lubricated bearings and Class F insulation.
K. Electrical Requirements:
1. Unit/module primary electrical power supply shall enter the unit at a single location.
2. Unit shall operate on 3-phase power at the voltage shown in the equipment schedule.
3. Control points shall be accessed through terminal block.
4. Unit shall be shipped with factory control and power wiring installed.
L. Chilled Water Circuit:
1. Chilled water circuit shall be rated for 300 psig (2068 kPa).
2. Thermal dispersion proof of flow switch shall be factory installed and wired.
1. BACnet Communication:
Shall provide pre-programmed factory-installed communication capability with a BACnet MS/TP network.
No field programming shall be required.

Fan Coil Units
PART 1 - GENERAL
1.01 WARRANTY
A. The equipment manufacturer shall provide, at no additional cost, a STANDARD PARTS WARRANTY that covers a period of one year from unit start-up or 18 months from shipment, whichever occurs first. This warrants that all products are free from defects in material and workmanship and shall meet the capacities and ratings set forth in the equipment manufacturer's catalog and bulletins.

- PART 2 - PRODUCTS
2.01 GENERAL UNIT DESCRIPTION
A. Manufacturer shall provide unit arranged for draw-through application. Unit layout and configuration shall be as defined in project plans and schedule. Blow-through is only acceptable when consideration is given to capturing downstream moisture carryover. Considerations include downstream moisture eliminators and/or extended blank modules with condensate drain pans.
2.02 UNIT CASING
A. The entire air handler shall be constructed of galvanized steel. The removal of access panels shall not affect the structural integrity of the unit once the unit is installed. Contractor shall be responsible to provide connection flanges and all other framework that is needed to properly support the unit.
B. Access panels shall be on side of the unit in all sections to allow easy access to drain pan, filter, coil(s), and motor components for cleaning, inspection, and maintenance.
C. Access Panels: Removable access panels shall be provided on side of the unit to facilitate service access to drain pans, motors, coil(s). Access panel for filter removal shall be provided on side of the unit.
D. Cabinet: Casing shall be manufactured of heavy gauge galvanized steel.

- 2.03 COILS
A. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil.
B. Coils shall be manufactured with plate fins to minimize water carryover and maximize outside thermal efficiency. Fin tube holes shall have drawn and belled collars to maintain consistent fin spacing to ensure performance and air pressure drop across the coil are as scheduled. Tubes shall be mechanically expanded and bonded to fin collars for maximum thermal conductivity. Use of soldering or tinning during the fin-to-tube bonding process is not acceptable due to the inherent thermal stress and possible loss of bonding at that joint.
C. Construct coil casings of galvanized steel. End supports shall have belled tube holes to minimize wear of the tube wall during thermal expansion and contraction of the tube.
D. Hydronic Coils
1. Supply and return header connections shall be clearly labeled on outside of units, such that direction of coil water-flow is counter to direction of unit air-flow.
2. Coils shall be proof tested to 450 psig and leak tested to 300 psig air pressure under water.
3. Headers shall be constructed of round copper pipe.
4. Unit shall be provided with minimum 3/8 inch O.D. copper coils. All fins shall be aluminum.
5. All coil connections shall be on same side of unit.

- 2.04 DRAIN PAN
A. Drain Pan(s) shall be constructed of corrosion resistant material. Acceptable materials include polymer or stainless steel. Units with cooling coils shall have drain pans under complete cooling coil section that extend beyond the air-leaving side of the coil to ensure capture of all condensate in section.
B. Drain pan manufacturer shall either insulate bottom of drain pan with closed cell foam or provide double wall internally insulated construction to eliminate bottom sweating.
C. Drain pan shall be sloped in two planes, pitched toward drain connections to ensure complete condensate drainage when unit is installed level and trapped per manufacturer's installation instructions. Units without drain pans sloped in two planes shall coat drain pans with anti-microbial treatment.
D. Drain pan(s) shall have main and auxiliary drain connections with auxiliary outlet higher than the main connection.
E. Coil(s) shall be mounted above the drain pan to facilitate easy and complete inspection, cleaning, and removal. Coils(s) may not sit in drain pan.
2.05 FANS
A. Provide single-wheel, dual-width, dual-inlet, forward curved centrifugal fans as specified on the schedule. All fans shall be dynamically balanced.
2.06 MOTORS
A. All motors shall be factory-installed and run tested. To facilitate field replacement of motors, a removable fan inlet cone shall be provided on the drive side of the fan/motor assembly.
B. Motor shall be ECM programmable type. The motor shall be preprogrammed in the factory to meet the specified airflow requirements.
C. Fan motor shall have permanently lubricated and sealed bearings, protected by an internal thermal overload.
D. Single phase motors shall be selected to operate continuously at 104 F (40 C) ambient without tripping on overloads. Motors shall have a +/- 10 percent voltage utilization range to protect against voltage variation.
E.
2.07 FILTERS
A. Provide removable one- or two-inch thick filters easily removable from side of the unit. All units shall use standard filter sizes.
2.08 CONTROLS
A. Fan motor and end devices shall be wired back to a control box enclosure. A junction box shall be provided for single point power connection.
B. The control package shall include the following at a minimum:
1. 24 VAC transformer
2. Disconnect switch
C. The control package shall include the following options:
1. Fan status relay
D. Control Interface - Unit shall be factory run tested and end devices shall be factory wired to terminal strip in an external junction box and tested for wiring continuity.

- 3.01 SHIPPING
A. Paper copies of the IOM shall also be shipped with each unit.
B. The manufacturer shall identify all shipments with the order number. Enough information shall be provided with each shipment to enable the Mechanical Contractor to confirm the receipt of units when they are received. For parts too small to mark individually, the manufacturer shall place them in containers.
C. To protect equipment during shipment and delivery, unit air inlet and outlet openings shall ship from manufacturer with removable sealed covering. Covering shall not constrain the unit installation process.
D. After loading the equipment for shipment, the manufacturer shall contact the shipping contact on the order and provide the name of the carrier, description of equipment, order number, shipping point, and date of shipment.

Base-Mounted, Centrifugal Hydronic Pumps

- 1. The pumps shall be long coupled, base mounted, single stage, end suction, vertical split case design, in cast iron stainless steel fitted, specifically designed for quiet operation. Suitable standard operations at 225°F and 175 PSIG working pressure or optional operations at up to 250°F and 250 PSIG working pressures. Working pressures shall not be de-rated at temperatures up to 250F. The pump internals shall be capable of being serviced without disturbing piping connections, electrical motor connections or pump to motor alignment.
2. The pumps shall be composed of three separable components a motor, bearing assembly, and pump end (wet end). The motor shaft shall be connected to the pump shaft via a replaceable flexible coupling.
3. A bearing assembly shall support the shaft via two heavy-duty re-greaseable ball bearings. Bearing assembly shall be replaceable without disturbing the system piping and shall have foot support at the coupling end. Pump bearings shall be re-greaseable without removal of the bearings from the bearing assembly. Thermal expansion of the shaft toward the impeller shall be prevented via an inboard thrust bearing.
4. The bearing assembly shall have a solid SAE1144 steel shaft. A stainless steel shaft sleeve shall be employed to completely cover the wetted area under the seal.
5. Pump shall be equipped with an internally-flushed mechanical seal assembly installed in an enlarged tapered seal chamber. Application of an internally flushed mechanical seal shall be adequate for seal flushing without requiring external flushing lines. Seal assembly shall have Buna bellows and seat gasket, stainless steel spring, and be of a carbon ceramic design with the carbon face rotating against a stationary ceramic face.
6. Bearing assembly shaft shall connect to a stainless steel impeller. Impeller shall be both hydraulically and dynamically balanced to ANSI/HI 9.6.4-2016, balance grade GG.3 and secured by a stainless steel locking cap screw or nut.
7. Pump should be designed to allow for true back pull-out allowing access to the pump's working components, without disturbing motor or piping, for ease of maintenance.
8. A center drop-out type coupling, capable of absorbing torsional vibration, shall be employed between the pump and motor. Pumps for variable speed application shall be provided with a suitable coupling sleeve. Coupling shall allow for removal of pump's wetted end without disturbing pump volute or movement of the pump's motor and electrical connections. On variable speed applications the coupling sleeve should be constructed of an neoprene material to maximize performance life.
9. An ANSI and OSHA rated coupling guard shall shield the coupling during operation. Coupling guard shall be dual rated ANSI B15.1 and OSHA 1910.219 compliant coupling guard and contain viewing windows for inspection of the coupling. No more than .25 inches of either rotating assembly shall be visible beyond the coupling guard.
10. Pump volute shall be of a cast iron design for heating systems with integrally cast pedestal volute support, rated for 175 PSIG with integral cast iron flanges drilled for 125# ANSI companion flanges. (Optional 250 PSIG working pressures are available and are 250# flange drilled.) Volute shall include gauge ports at nozzles, and vent and drain ports.
11. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Pump and motors shall be factory aligned, and shall be realigned after installation by the manufacturer's representative. Motors shall be non-overloading at any point on the pump curve and shall meet NEMA specifications and conform to standards outlined in EISA 2007.
12. Base plate shall be of structural steel or fabricated steel channel configuration fully enclosed at sides and ends, with securely welded cross members and fully open grouting area (for field grouting). The minimum base plate stiffness shall conform to ANSI/HI 1.3.8.2.1-2019 for grouted Horizontal Baseplate Design standards.
13. Pump shall be of a maintainable design and, for ease of maintenance, should use machine fit parts and not press fit components.
14. The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 9.6.4-2016 for recommended acceptable unfilled field vibration limits (as measured per ANSI/HI 9.6.4-2016 Figure 9.6.4.2.3.1) for pumps with rolling contact bearings.
15. Pump manufacturer shall be ISO-9001 certified.
16. Each pump shall be hydrostatically tested 1.5 times the maximum rated working pressure and name-plated before shipment.
17. Pump shall conform to ANSI/HI 9.6.3.1-2012 standard for Preferred Operating Region (POR) unless otherwise approved by the engineer.

Pump Suction Diffusers

- 1. The suction diffuser body shall be made of either cast iron or ductile iron.
2. The suction diffuser shall include a Flow Cone to eliminate recirculation and direct flow completely out of the body and into the pump suction.
3. The suction diffuser shall include a full-length, 4-plane, removable straightening vane.
4. The straightening vane shall be made of either carbon steel or 304 stainless steel.
5. The suction diffuser shall include a full-length removable orifice cylinder with 3/16" perforations and 51% open area.
6. The orifice cylinder shall be made of either carbon steel or 304 stainless steel.
7. The suction diffuser shall have a full-length removable start-up strainer.
8. The start-up strainer shall be made of 16 mesh bronze wire.
9. The suction diffuser shall be available with either flanged end connections or grooved end connections.
10. Flange end connections should be designed according to ANSI Class 150 Standards.
11. Suction diffuser models with either flange x flange or groove x flange end connections should be rated for 175 psi (1,207 kPa) maximum working pressure. Models with groove x groove end connections should be rated for 300 psi (2,068 kPa) working pressure.
12. The suction diffuser shall have a maximum temperature rating of 250°F (121°C).

Pump Triple Duty Valves

- 1. The valve shall be a straight pattern, non-adjustable design.
2. The valve shall be a globe valve design.
3. The valve shall have a spring-loaded check valve design to prevent gravity circulation and backflow.
4. The valve shall have a calibrated nameplate with multi-turn stem.
5. The valve shall include a rubber memory button to allow the valve to be re-balanced to its original position after shut-off or maintenance.
6. The valve shall have a fully back seating disc to allow the valve packing to be replaced while under pressure.
7. The valve body shall be made of either cast iron or ductile iron.
8. The valve disc shall be made of brass with an EPDM rubber seat.
9. The valve stem shall be made of stainless steel.

- 10. The valve spring shall be made of stainless steel.
11. The valve shall be available with either flanged end connections or grooved end connections.
12. Flange end connections should be designed according to ANSI Class 150 Standards.
13. Valve models with flange x flange end connections shall be rated for 175 psi (1,207 kPa) maximum working pressure. Models with groove x groove end connections should be rated for 300 (2,068 kPa) psi working pressure.
14. The valve shall have a maximum temperature rating of 250°F (121°C).

Packaged Rooftop HVAC Equipment

PRODUCTS

PACKAGED ROOFTOP UNITS

- 1. Cabinet:
a. Heavy gauge steel panels
b. Pre-painted steel panels
c. Full perimeter heavy gauge galvanized steel base rail
d. Forklift slots on base rail
e. Raised or flanged edges around duct and power entry openings
f. Insulation:
1. All panels adjacent to conditioned air are fully insulated with non-hygroscopic fiberglass insulation
2. Unit base is fully insulated
3. Unit base insulation also serves as air seal to the roof curb
g. Access Panels are provided for compressor/controls/heating areas, blower access and air filter/economizer access;
h. Exterior panels constructed of heavy-gauge galvanized steel with two layer enamel paint finish
i. Coil Guards
2. Cooling System:
a. Refrigerant type: R-410A
b. Compressors:
1. Scroll Type
2. Resiliently mounted on rubber grommets for quiet operation
3. Overload Protected
4. Internal excessive current and temperature protection
5. Isolated from condenser and evaporator fan air streams
6. Refrigerant cooled
c. Thermal Expansion Valve
d. High capacity filter/driers
e. High pressure switches
f. Freezestats
g. Crankcase heaters

3. Coil Construction:

- a. Tube and fin condensing/evaporator coil general construction:
1. Copper tube construction
2. Rippled-edge aluminum fins
3. Flared soldered tubing connections
4. Silver soldered construction for improved heat transfer
5. Factory leak tested at manufacturing facility
b. Evaporator Coils:
1. With balanced port thermal expansion valves, freeze protection on each compressor circuit, pressure and leak tested to 500 psi
2. Each compressor circuit on coil divided across face of coil and active through full depth of coil
c. Condensate Drain Pan:
1. Plastic pan, sloped to meet drainage requirements of ASHRAE
2. Side or bottom drain connections
d. Outdoor coil fan motors:
1. Thermal overload protected
2. Shaft up, wire basket mounted
e. Outdoor coil fans: PVC coated fan guard furnished

4. Gas Heating System:

- a. Induced draft
b. Natural gas fired system with direct spark ignition
c. Electronic flame sensors
d. Flame rollout switches
e. High heat limit switches
f. Induced draft failure switch and capable of operating to altitude of 2000 feet (610m) with no derate to manifold pressure
g. Service access for controls, burners and heat exchanger
h. Gas piping system tight and free of leaks when pressurized to maximum supply pressure
i. Gas Valve: Two-stage, redundant type gas heat valve with manual shutoff
j. Gas Burners: Aluminumized steel inshot-type gas burners
k. Gas piping system tight and free of leaks when

5. Supply Air Fan (Blower)

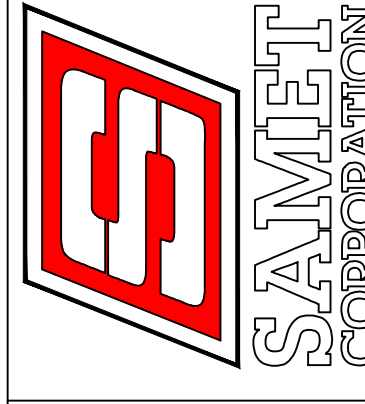
- a. Motor
1. Overload protected
b. Supply Air Blower
1. Forward curved blades
2. Wheel is statically and dynamically balanced
3. Equipped with ball bearings and/or adjustable pulley for speed change
4. Blower assembly slides out of unit for servicing
6. Supply Air Filters:
a. 2" MERV 8 Filters
7. Controls:
a. Unit Control
1. 24V transformer (secondary) with built in circuit breaker protection
b. Heat/Cool Staging
1. 2 heat/2 cool staging with a third party DDC control system or thermostat
c. Low voltage terminal block

EXECUTION

1. MANUFACTURER'S INSTRUCTIONS

- a. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product cart installation instructions and manufacturer's spec data sheets.
2. EXAMINATION
a. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

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04/28/2023

ALAMANCE/BUTLINGTON SCHOOL SYSTEMS WESTERN MS
2100 Elon Drive, Elon, NC 27244

MECHANICAL SPECIFICATIONS

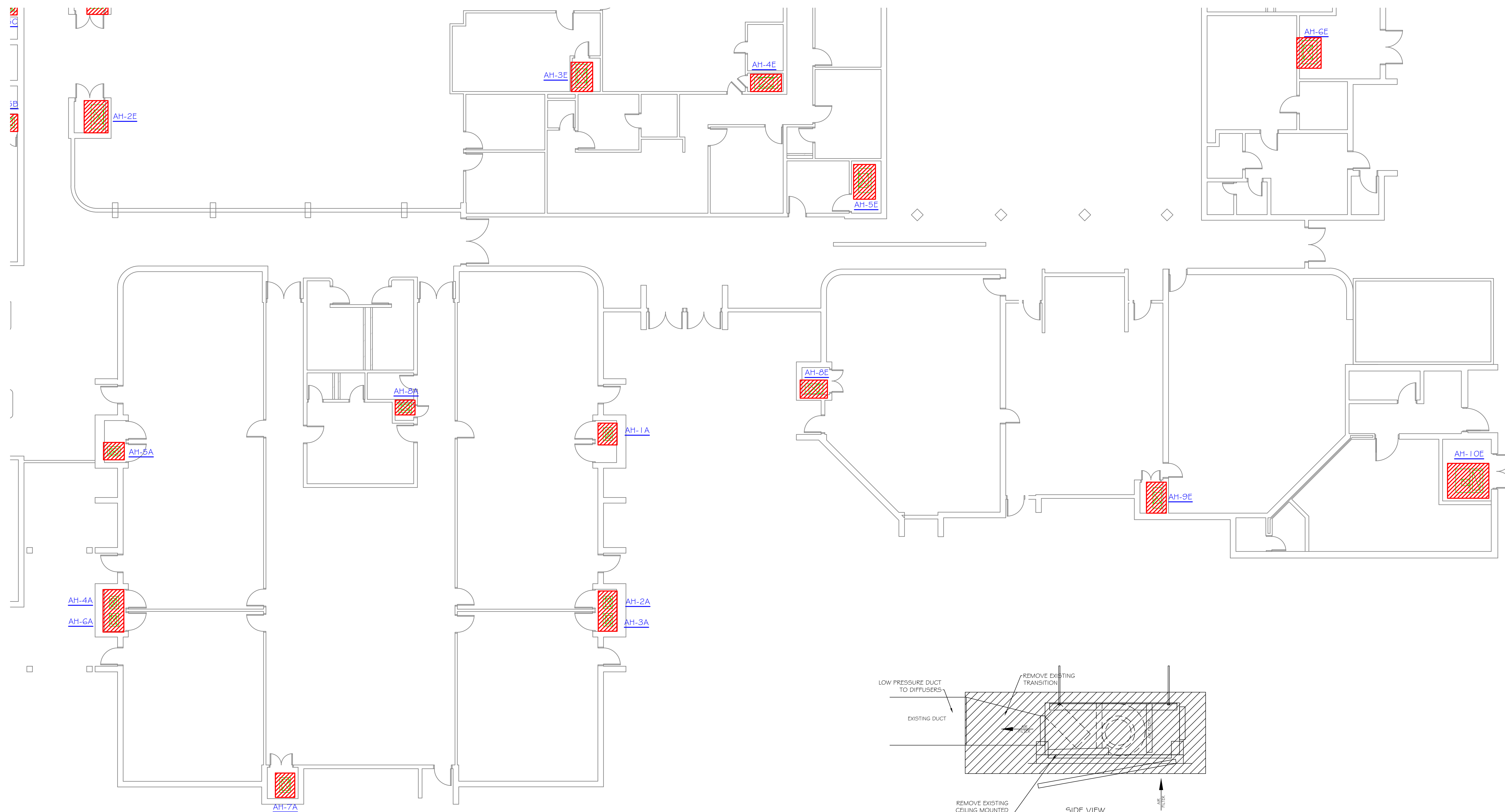
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MO.2

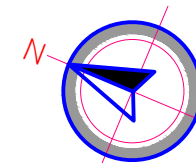






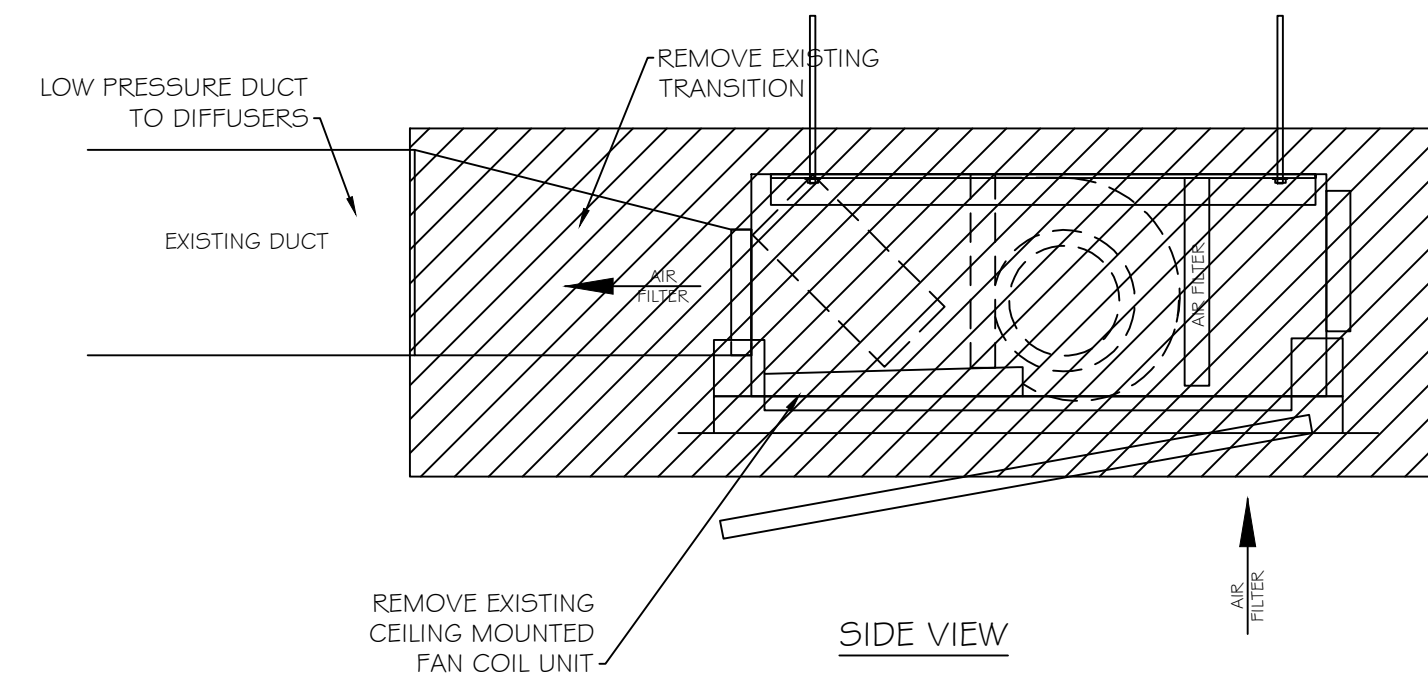


PARTIAL - GROUND LEVEL PLAN  
 CLASSROOMS/ADMINISTRATIVE  
 SCALE: 1/8"=1'-0"



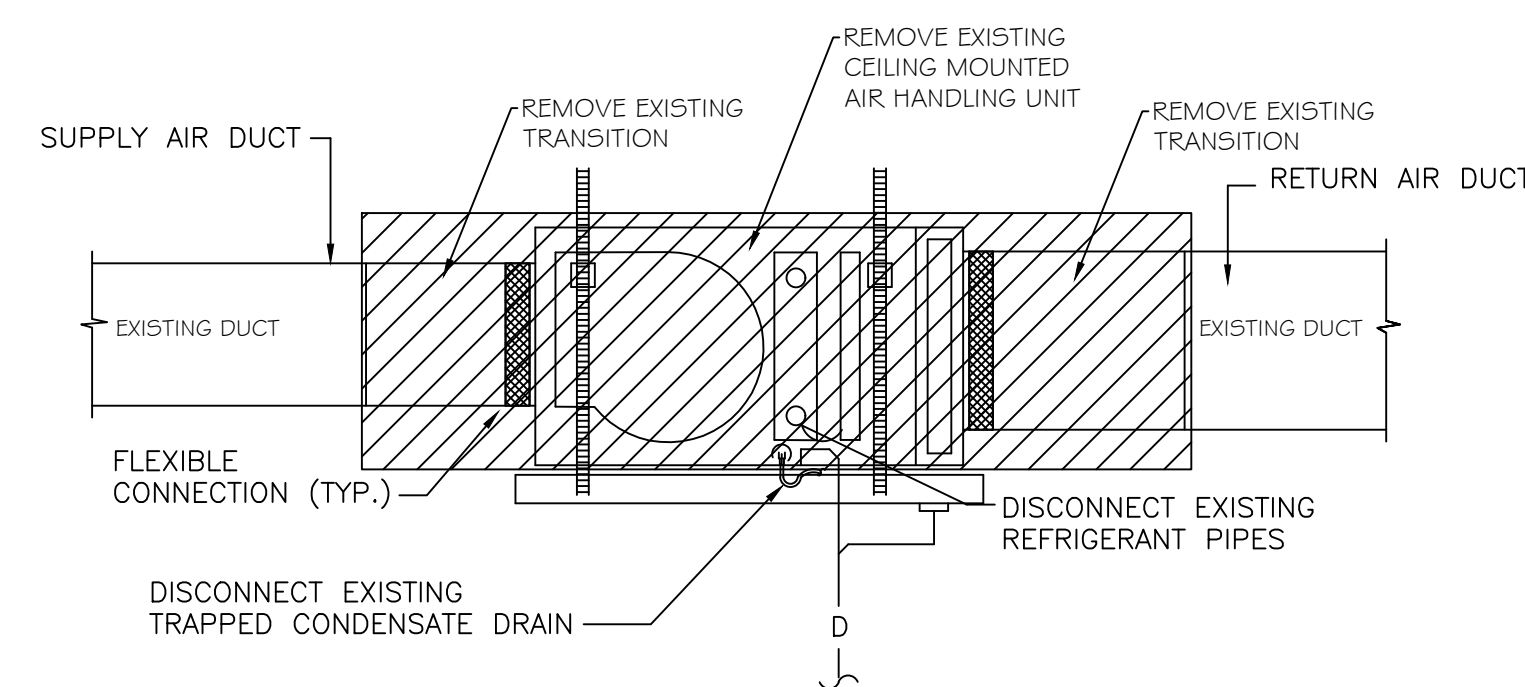
**NOTES:**

1. REMOVE A/C UNIT INLET DUCT TRANSITION THRU DISCHARGE DUCT TRANSITION, INCLUDING THE A/C UNIT.
2. REMOVE EXISTING ELECTRICAL FROM A/C UNIT TO DISCONNECT INCLUDING WIRE AND CONDUIT.
3. REMOVE CHWS/R AND HWS/R SUFFICIENT TO REMOVE A/C UNIT.



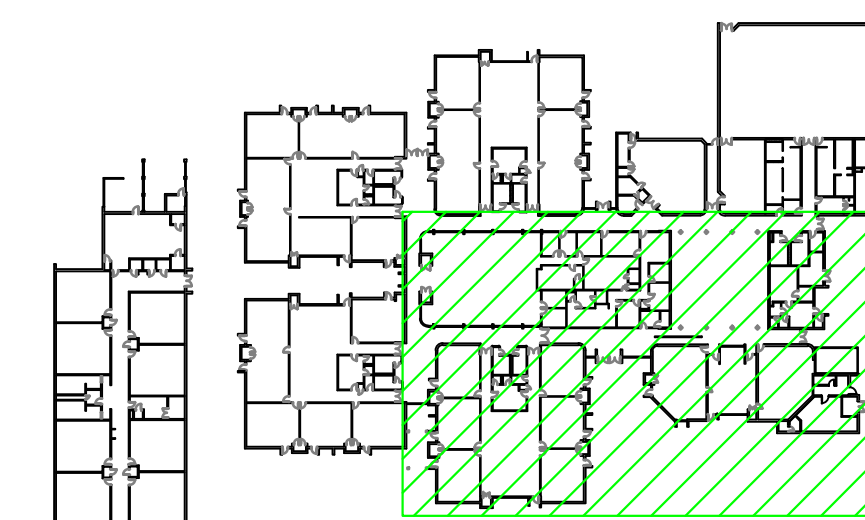
TYPICAL FAN COIL DEMOLITION DETAIL

NTS

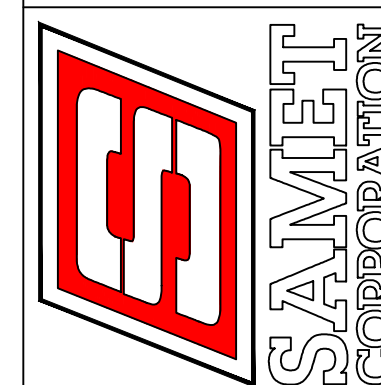
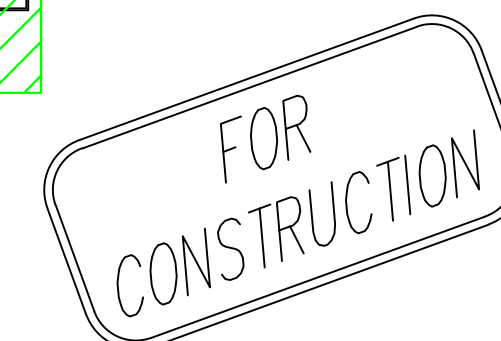


TYPICAL CEILING MOUNTED AHU DEMOLITION DETAIL

NTS



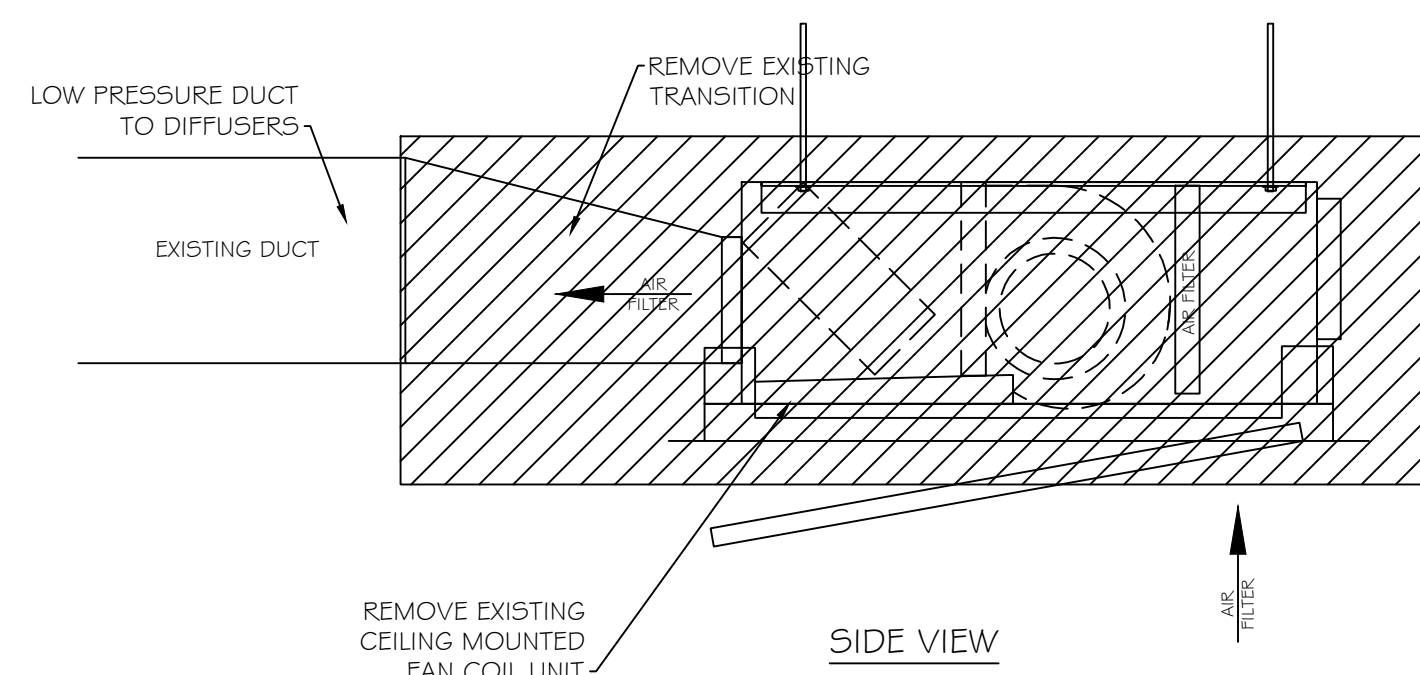
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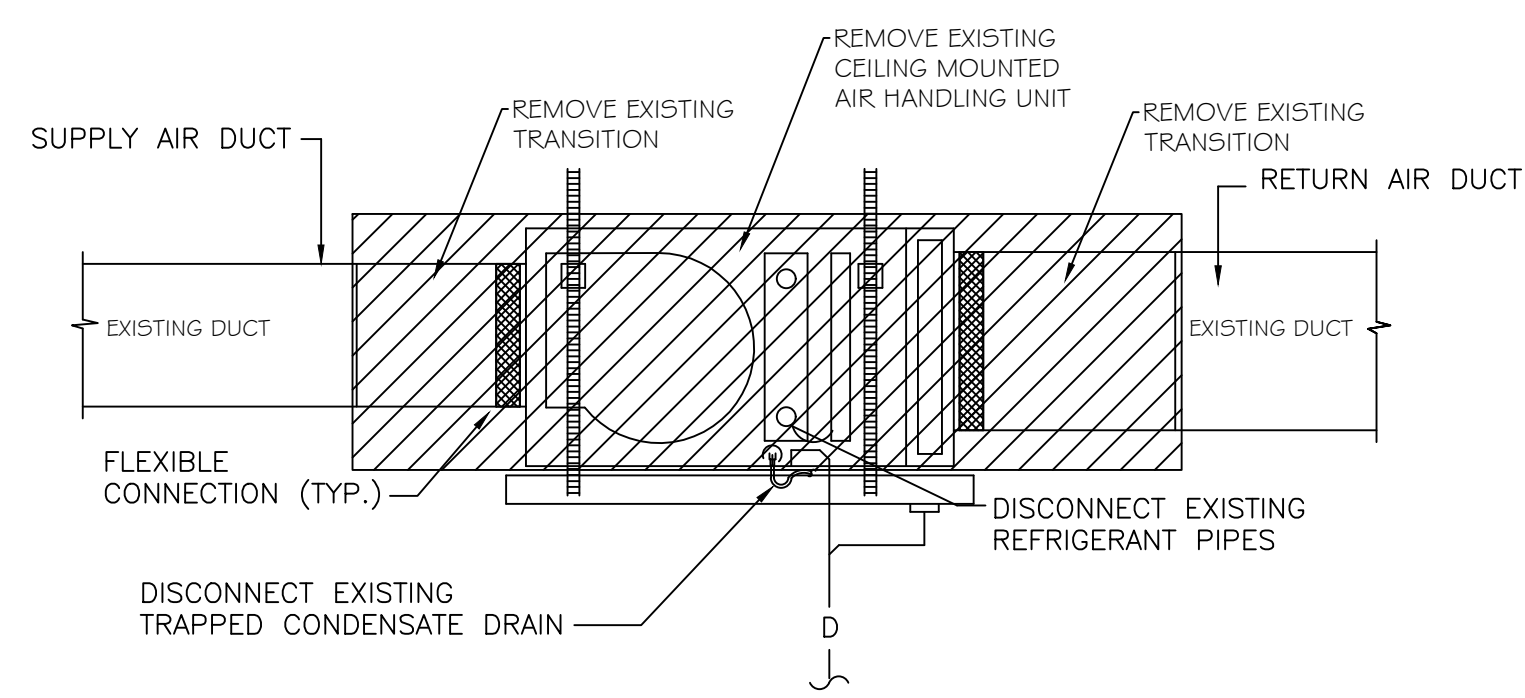
04/28/2023

REVISIONS	DATE

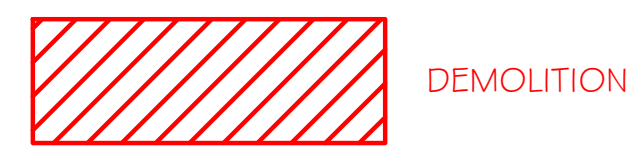
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 APPROVED BY: K.WATERS  
 DATE: 04/28/2023  
 PLOT SCALE: 1:1  
 FILE: A-4221\_MD1.0.DWG  
 SHEET NUMBER:



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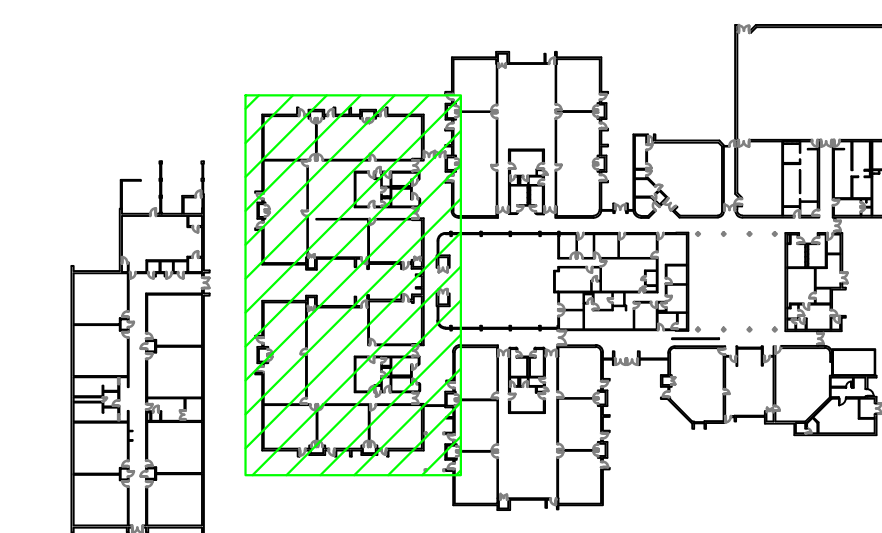
TYPICAL CEILING MOUNTED AHU DEMOLITION DETAIL  
NTS



PARTIAL - GROUND LEVEL PLAN  
CLASSROOMS  
SCALE: 1/8"=1'-0"

NOTES:

1. REMOVE A/C UNIT INLET DUCT TRANSITION THRU DISCHARGE DUCT TRANSITION, INCLUDING THE A/C UNIT.
2. REMOVE EXISTING ELECTRICAL FROM A/C UNIT TO DISCONNECT INCLUDING WIRE AND CONDUIT.
3. REMOVE CHWS/R AND HWS/R SUFFICIENT TO REMOVE A/C UNIT.



KEY PLAN

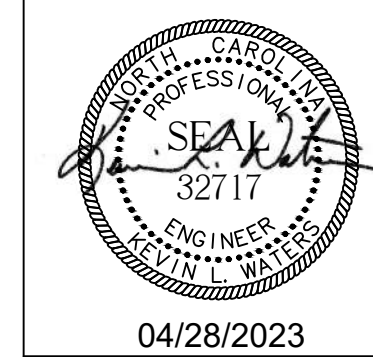
FOR  
CONSTRUCTION

REVISIONS	DATE

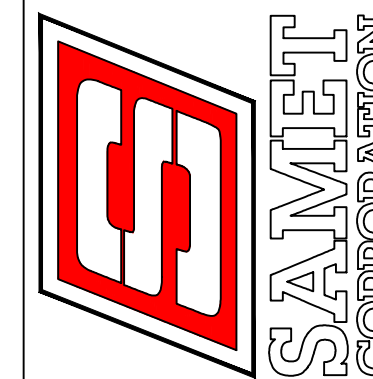
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APPROVED BY: K.WATERS  
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SHEET NUMBER:

MD1.2

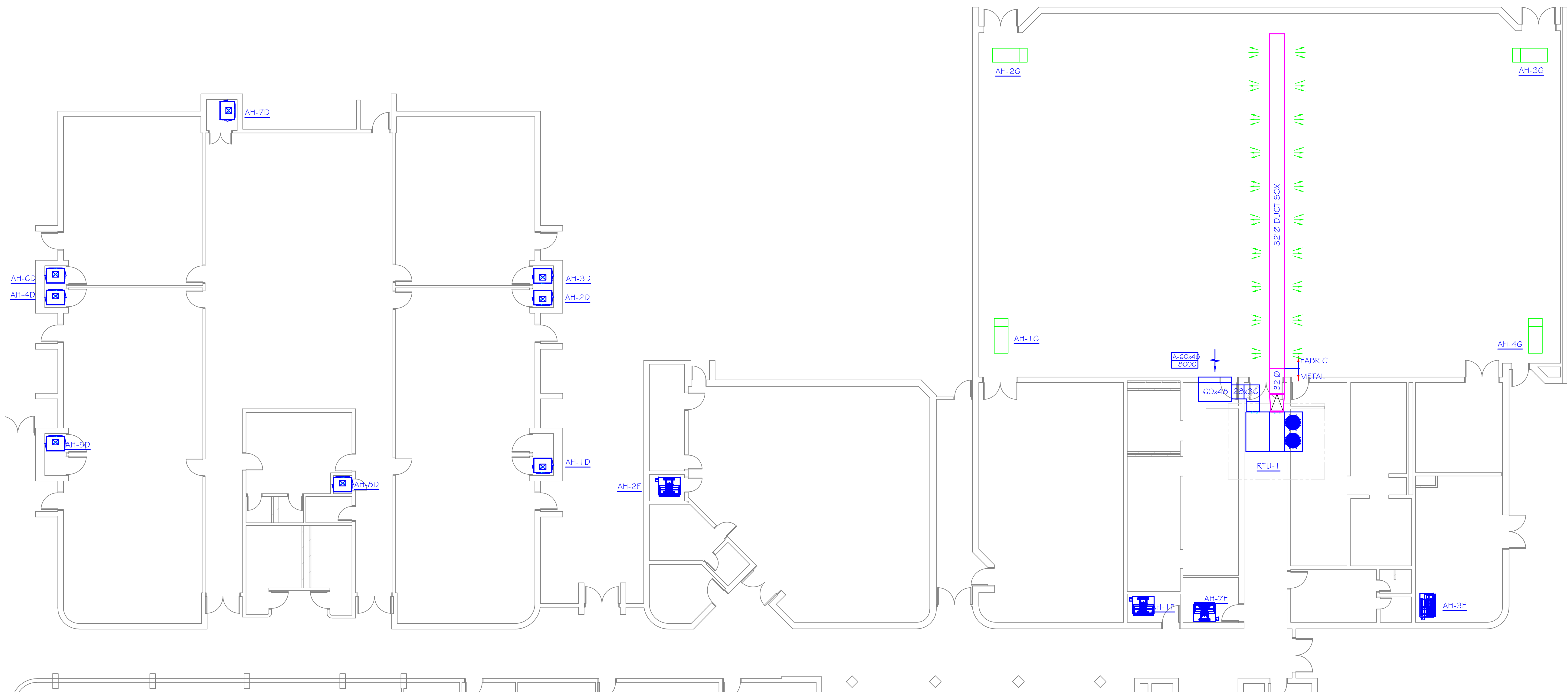
ALAMANCE/BUTLINGTON  
SCHOOL SYSTEMS  
WESTERN MS  
2100 Elon Drive, Elon, NC 27244



04/28/2023

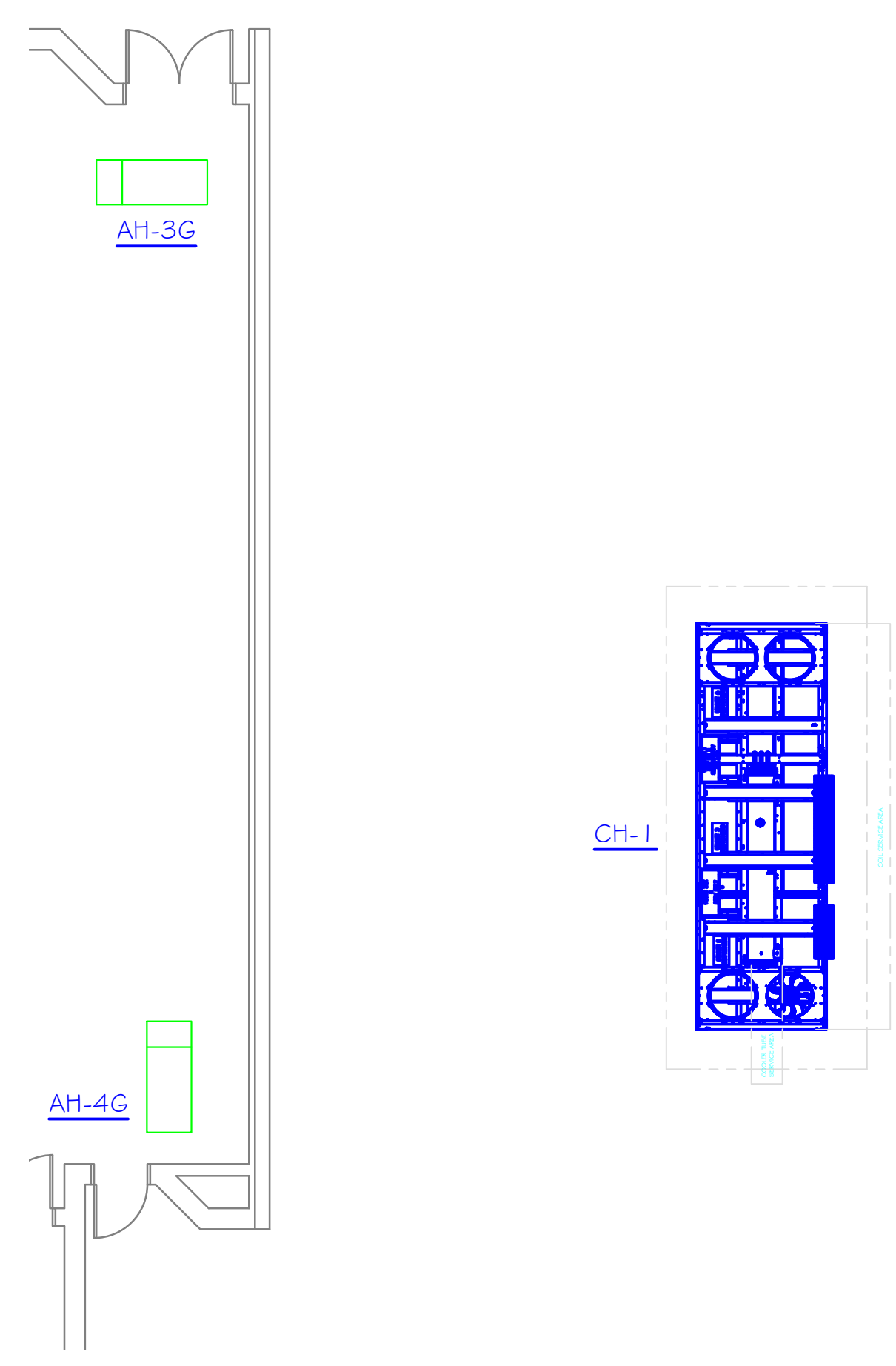


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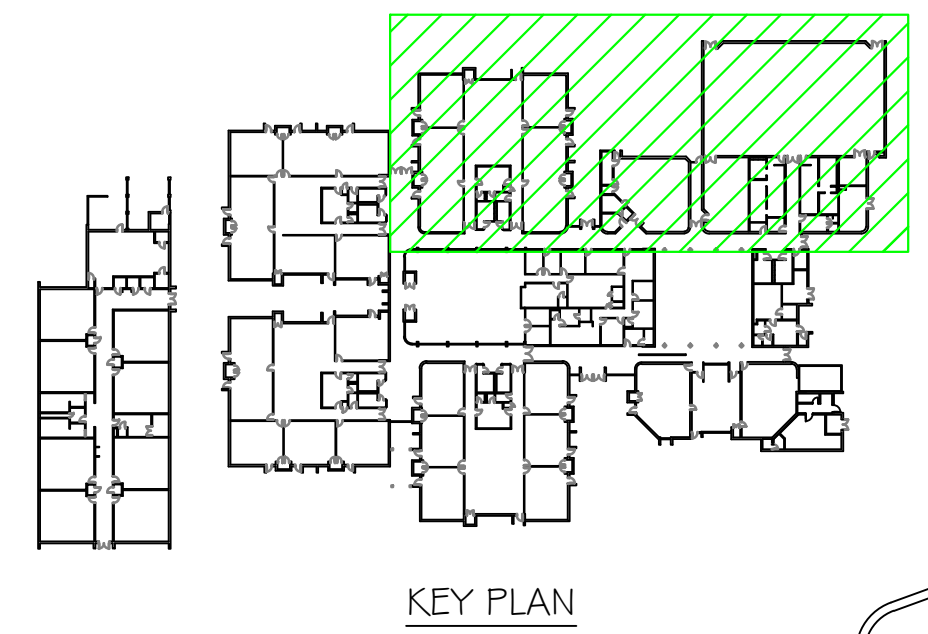
PARTIAL - BASEMENT PLAN  
FUEL STORAGE AREA  
SCALE: 1/8"=1'-0"

- NOTES:
1. PROVIDE NEW PUMPS AND ACCESSORIES PER SCHEDULE # DETAIL.
  2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO PUMP. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
  3. PROVIDE NEW CHWS/R AND HWS/R PIPING FOR NEW A/C UNIT PER DETAIL.



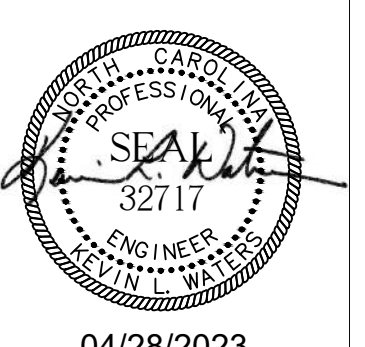
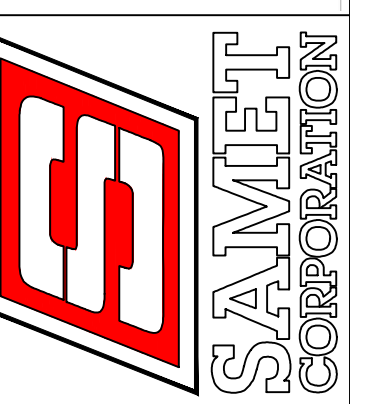
PARTIAL - BASEMENT PLAN  
FUEL STORAGE AREA  
SCALE: 1/8"=1'-0"

- NOTES:
1. PROVIDE NEW PUMPS AND ACCESSORIES PER SCHEDULE # DETAIL.
  2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO PUMP. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
  3. PROVIDE NEW CHWS/R PIPING FOR CHILLER PER DETAIL.



KEY PLAN

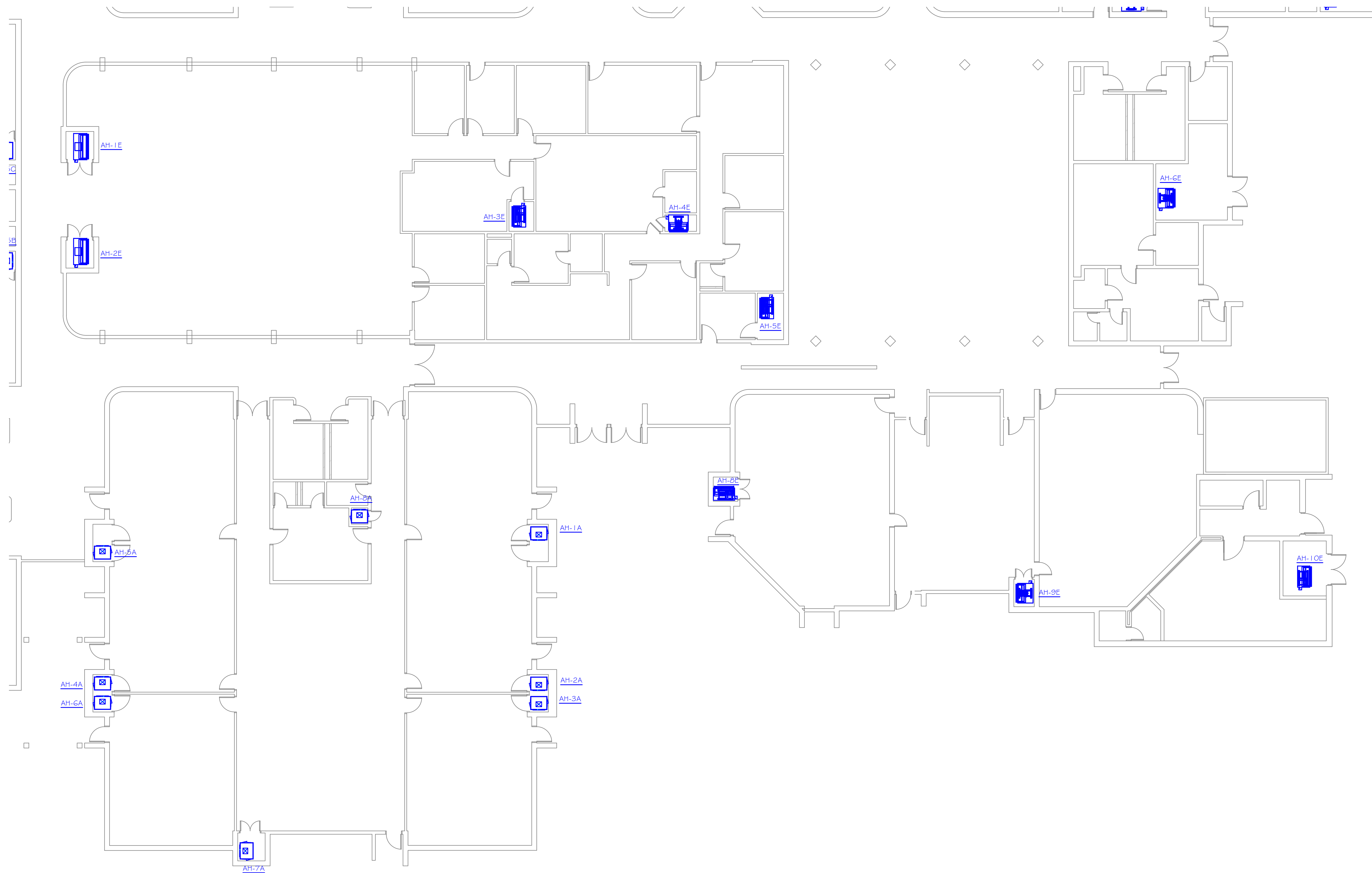
FOR CONSTRUCTION



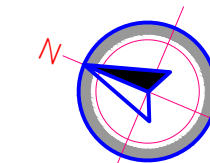
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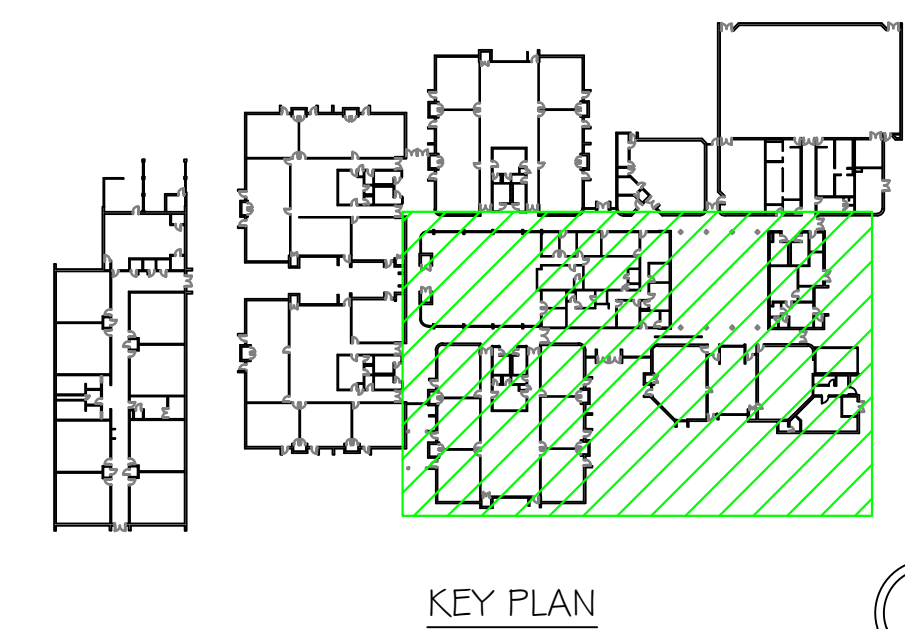


PARTIAL - GROUND LEVEL PLAN  
 CLASSROOMS/ADMINISTRATIVE  
 SCALE: 1/8"=1'-0"



**NOTES:**

1. PROVIDE NEW PUMPS AND ACCESSORIES PER SCHEDULE # DETAIL.
2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO PUMP. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
3. PROVIDE NEW CHWS/R AND HWS/R PIPING FOR NEW A/C UNIT PER DETAIL.



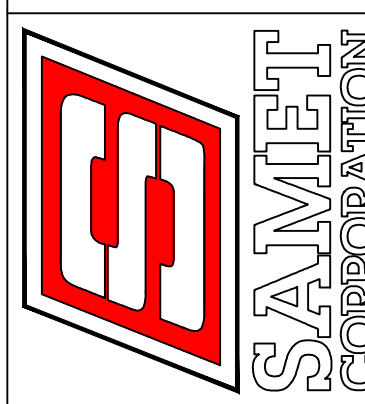
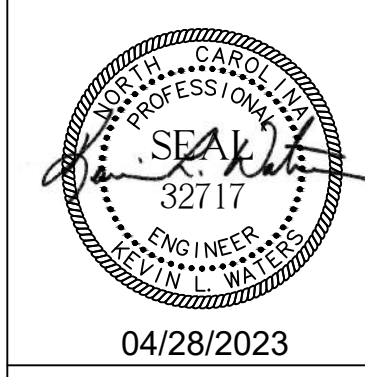
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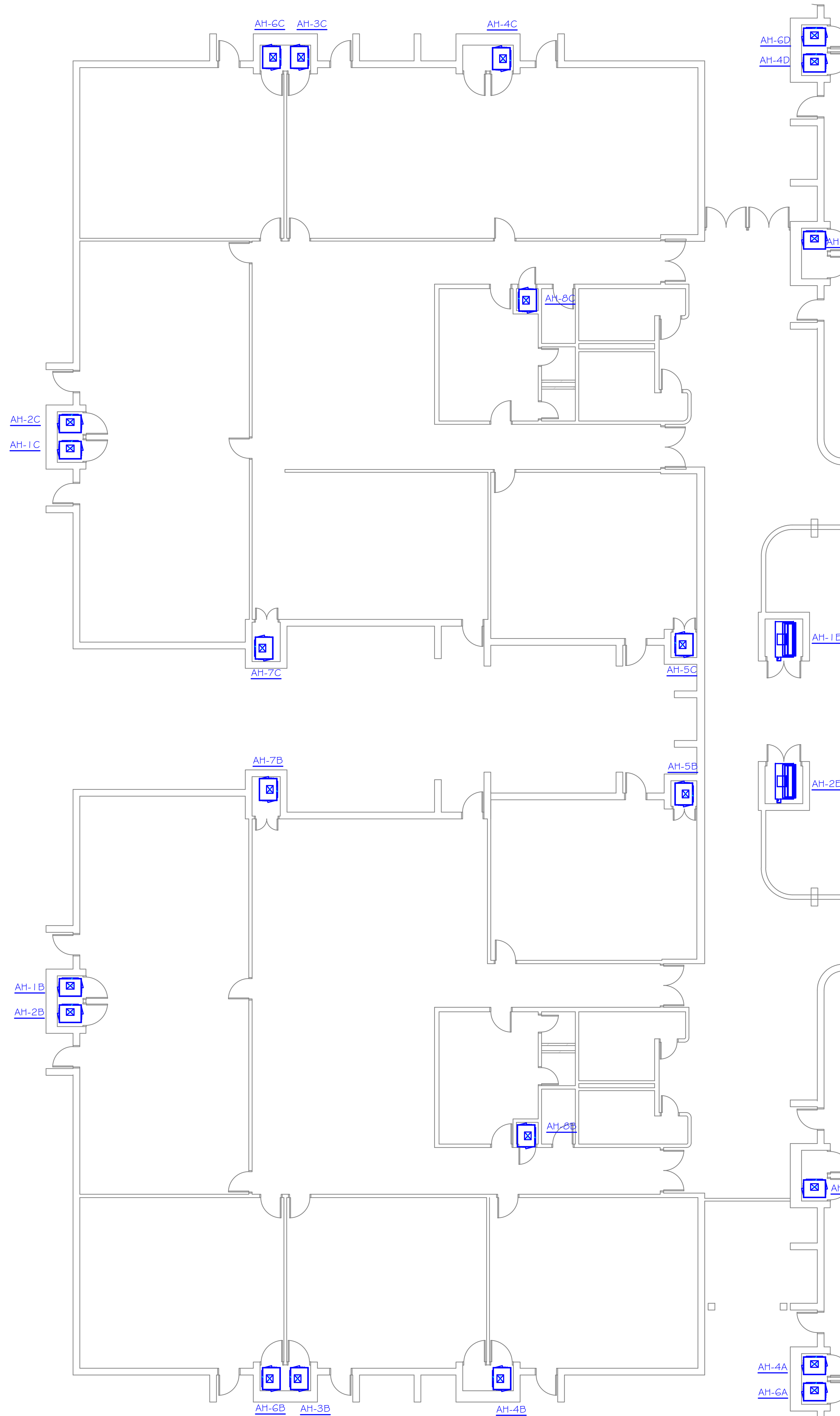
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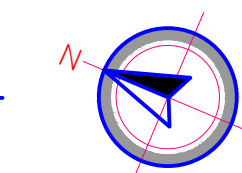
ALAMANCE/BUTLINGTON  
 SCHOOL SYSTEMS  
 WESTERN MS  
 2100 Elon Drive, Elon, NC 27244



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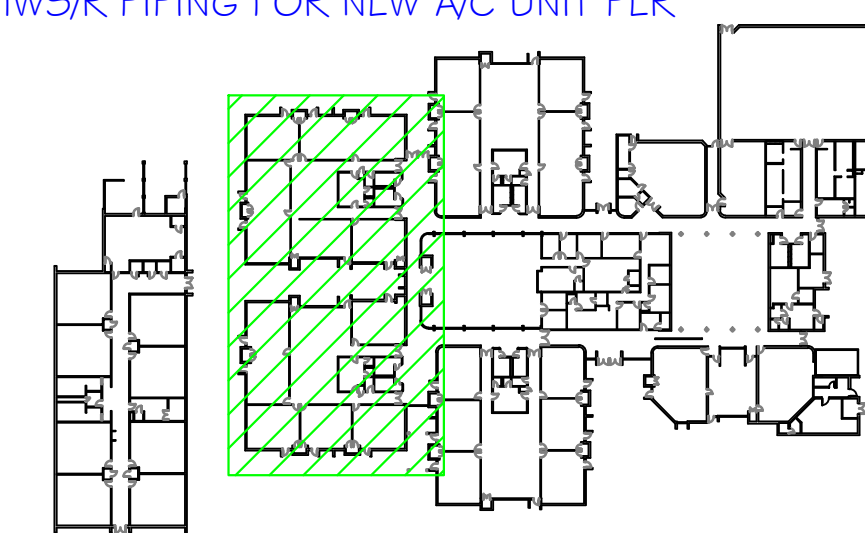


PARTIAL - GROUND LEVEL PLAN  
CLASSROOMS  
SCALE: 1/8"=1'-0"



NOTES:

1. PROVIDE NEW PUMPS AND ACCESSORIES PER SCHEDULE # DETAIL.
2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO PUMP. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
3. PROVIDE NEW CHWS/R AND HWS/R PIPING FOR NEW A/C UNIT PER DETAIL.



KEY PLAN

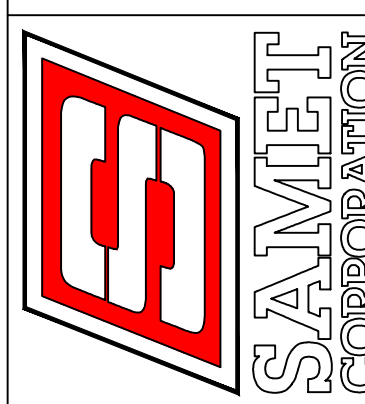
FOR  
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MECHANICAL  
HVAC  
PARTIAL PLAN

ALAMANCE/BUTLINGTON  
SCHOOL SYSTEMS  
WESTERN MS  
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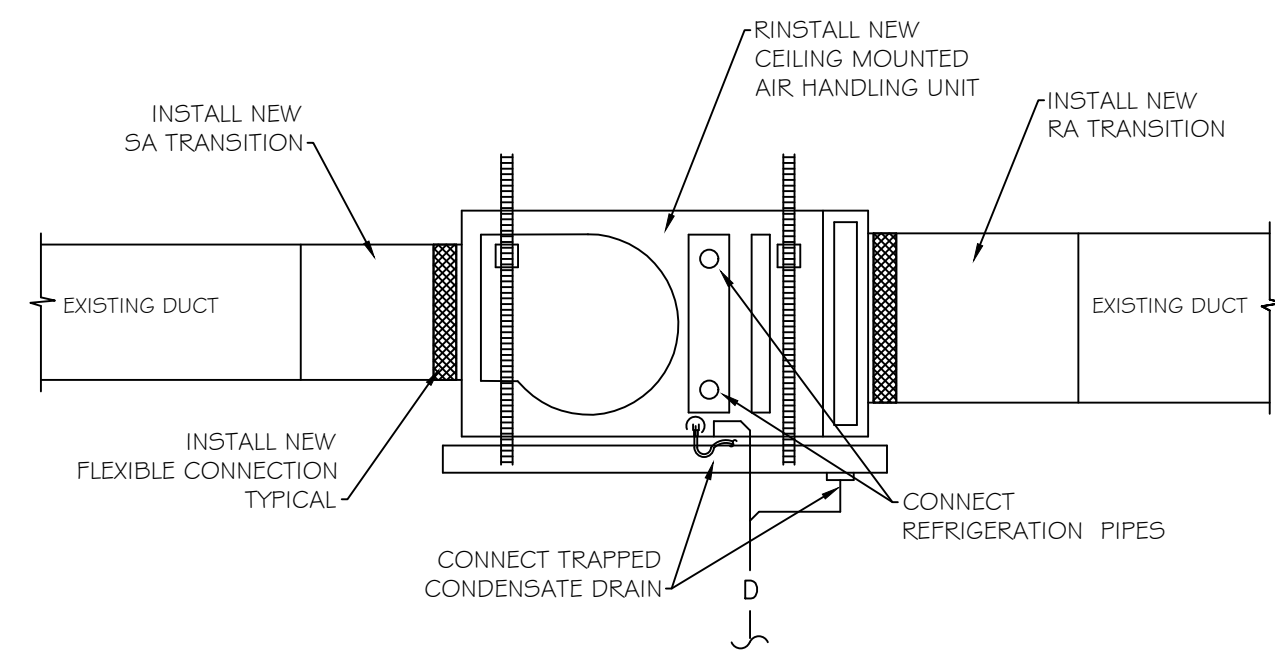


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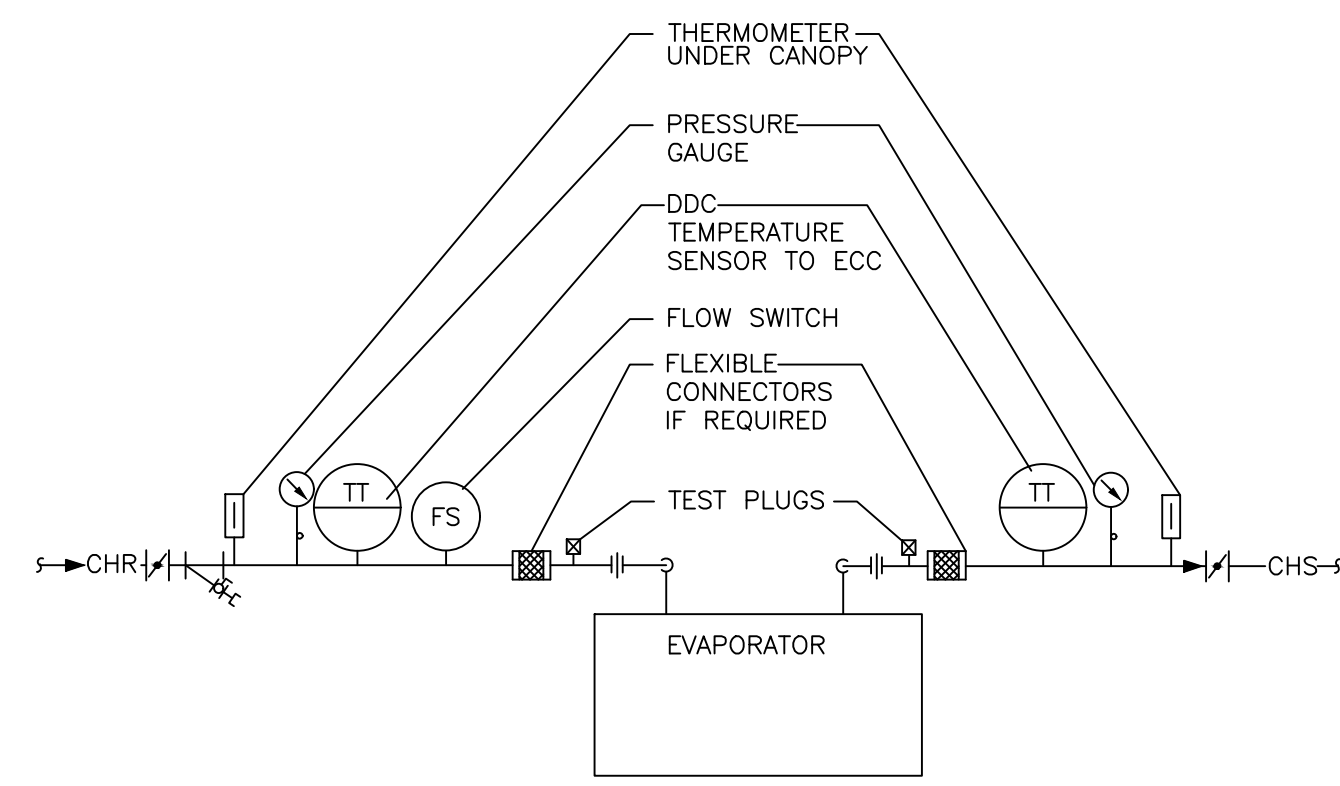
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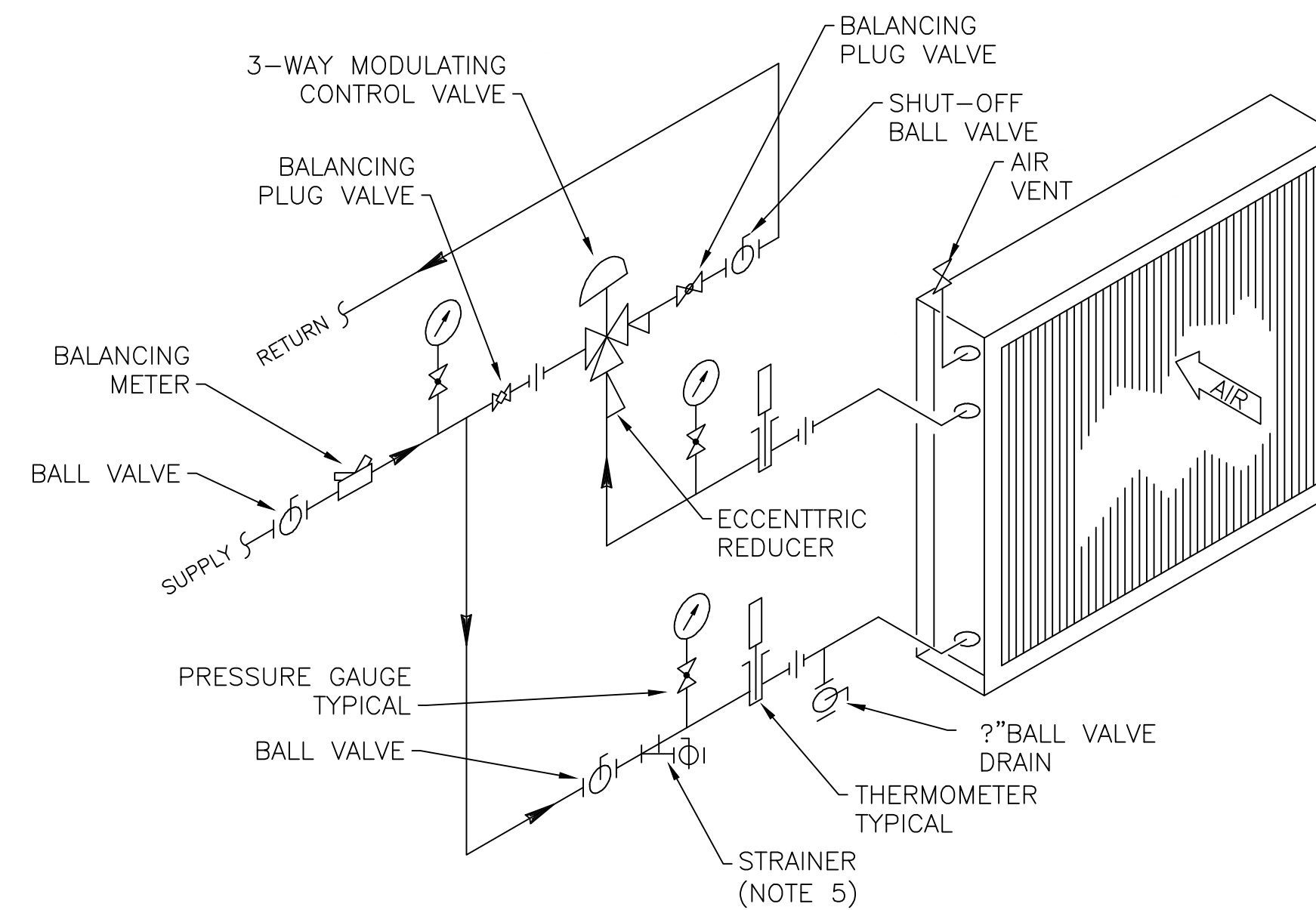
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**1 TYPICAL CEILING MOUNTED AHU DETAIL**  
NTS

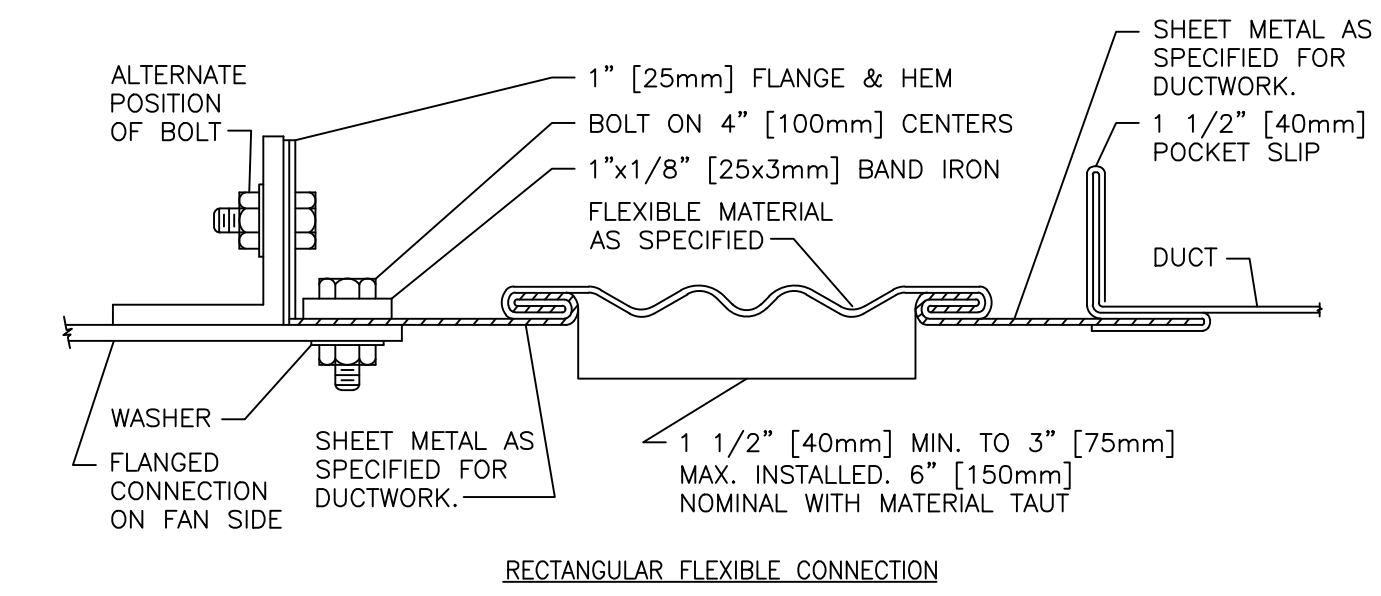


**2 AIR COOLED CHILLER - PIPING CONNECTIONS**  
NTS

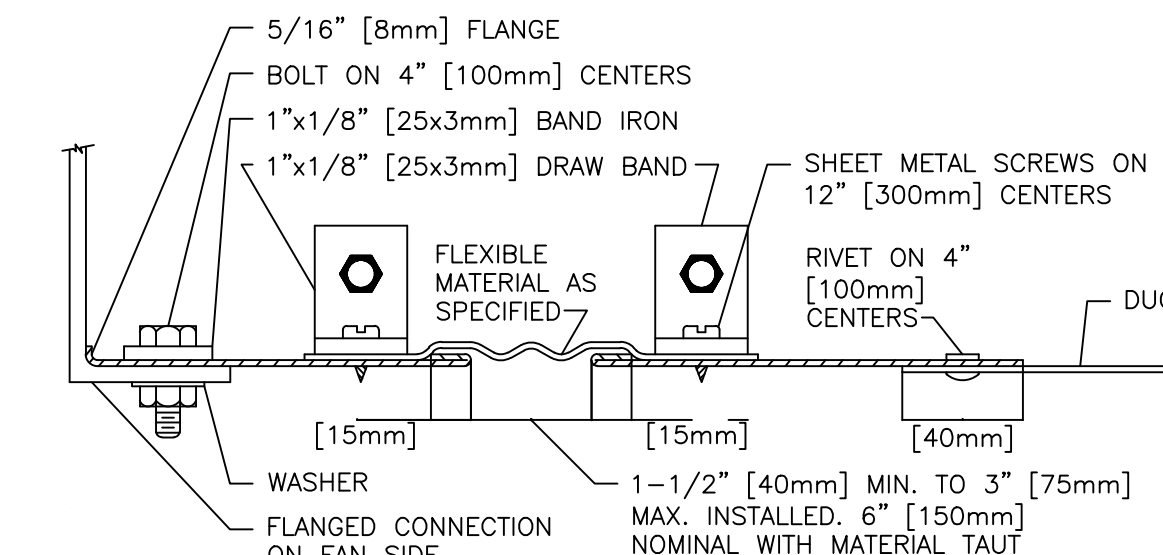


- NOTE:**
- WHERE PIPE SIZE IS 2 1/2" OR SMALLER, PROVIDE BALL VALVE IN LIEU OF BUTTERFLY VALVE.
  - PROVIDE THERMOMETERS AND PRESSURE GAUGES, PER SPECS.
  - INSTALL UNIONS IN PIPE LOCATION OUT OF WAY TO PULL COIL OUT
  - PROVIDE BALANCE METER IN THE SUPPLY PIPE FOR AHU COIL WITH 50 GPM OR MORE
  - PROVIDE BALL VALVE DRAIN VALVE AND DRAIN LINE TO FLOOR DRAIN.

**3 TYPICAL WATER COIL PIPING W/ 3-WAY CONTROL VALVE DETAIL**  
NTS

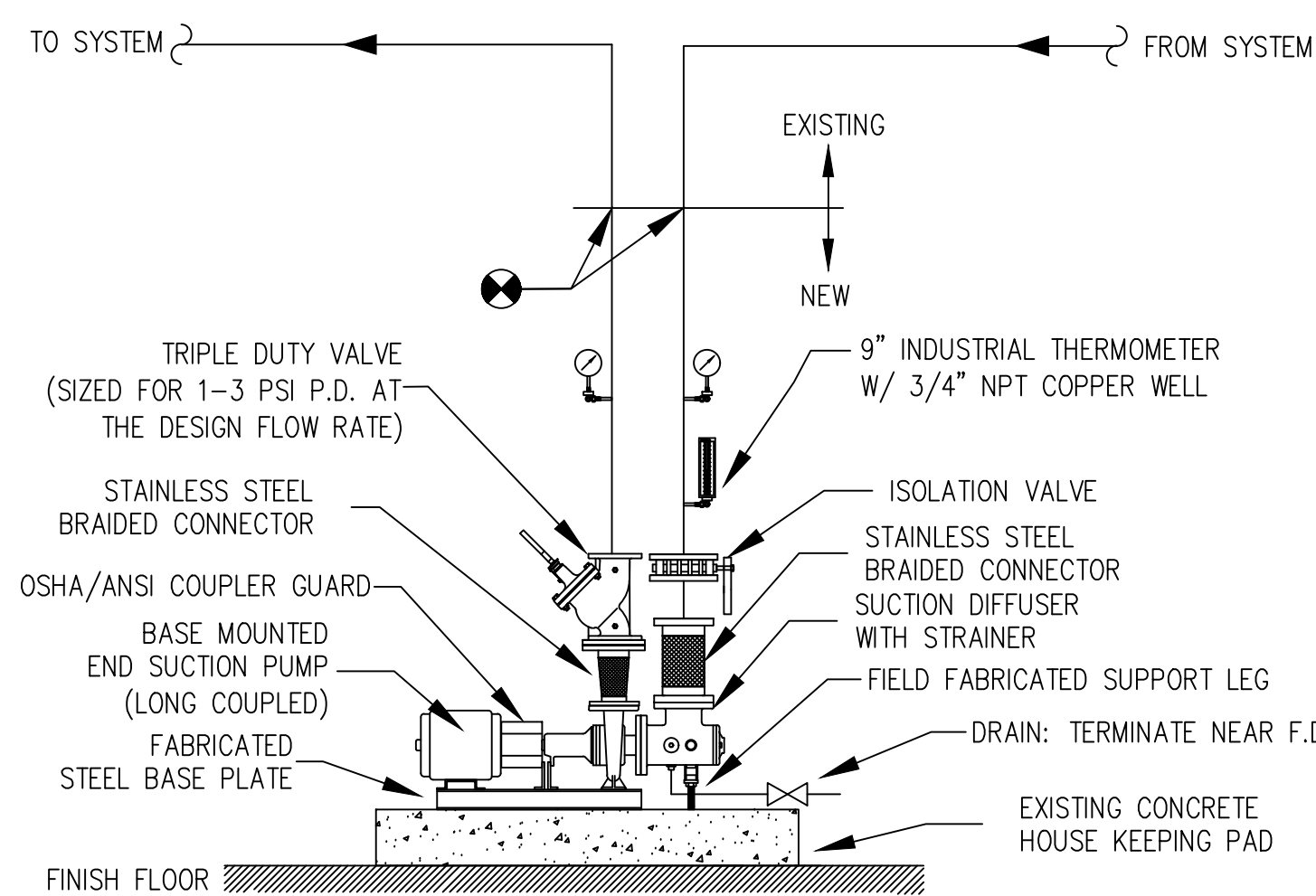


RECTANGULAR FLEXIBLE CONNECTION

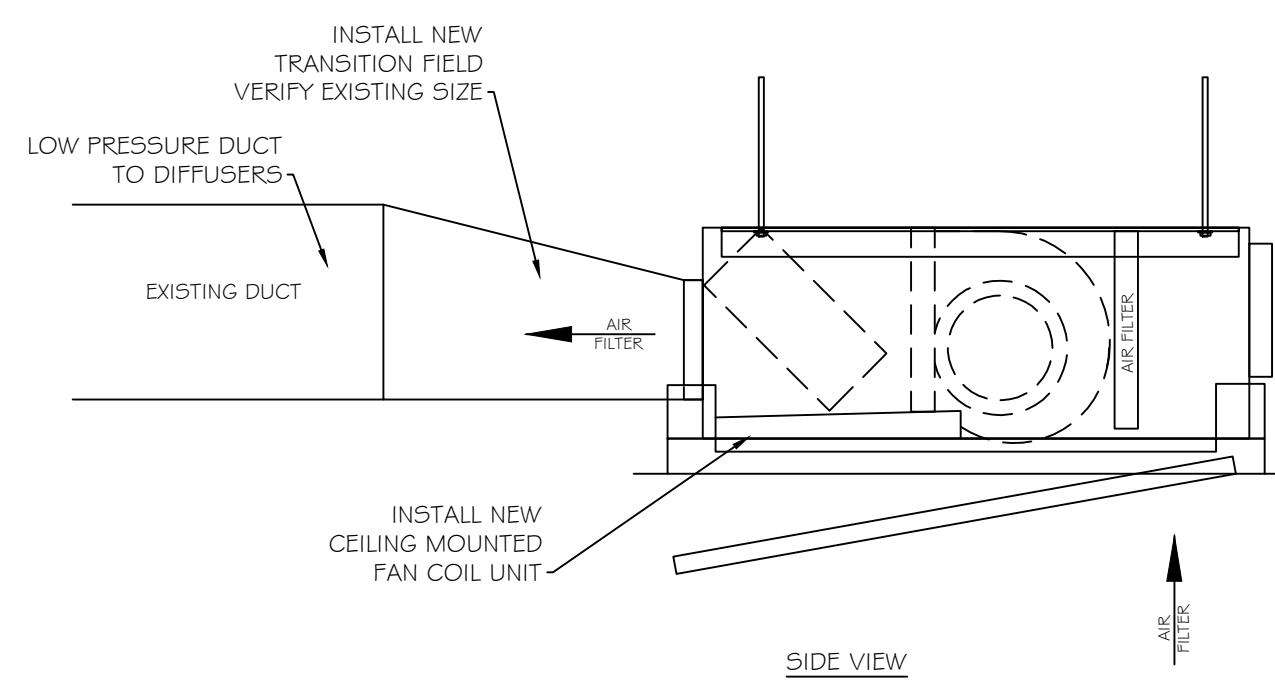


ROUND FLEXIBLE CONNECTION

**4 FLEXIBLE CANVAS CONNECTIONS**  
NTS

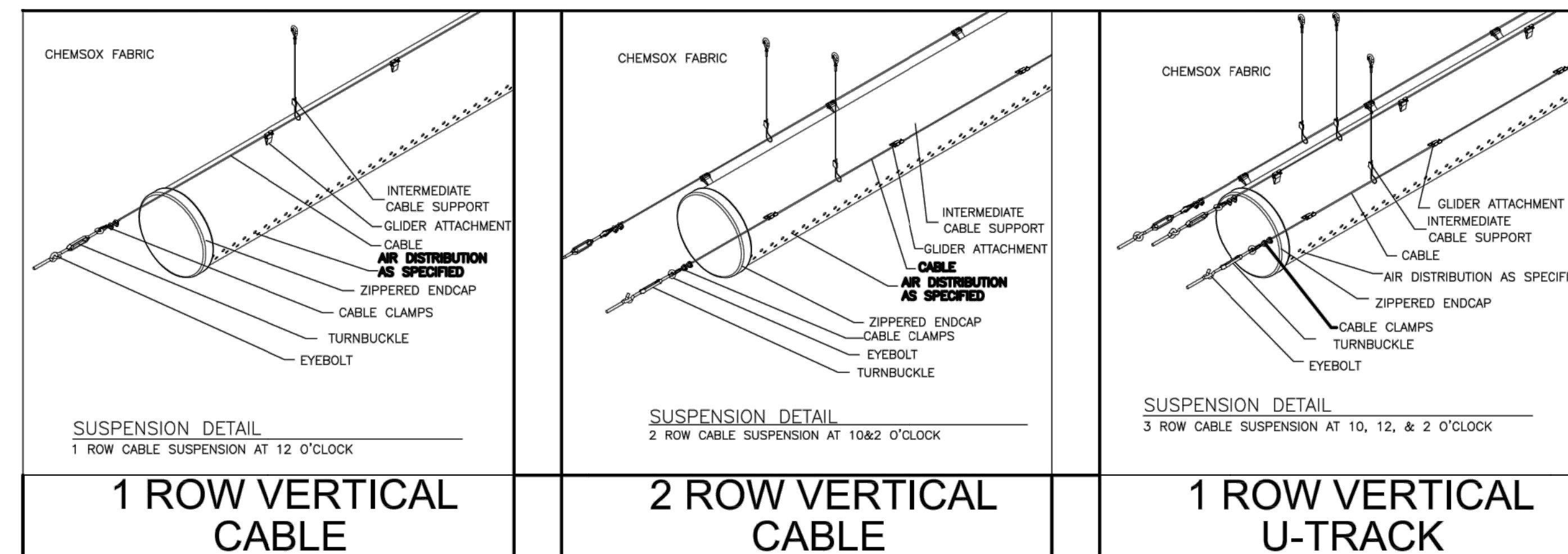


**5 END SUCTION PUMP DETAIL - (BASE MOUNTED ON A HOUSEKEEPING PAD)**  
NTS

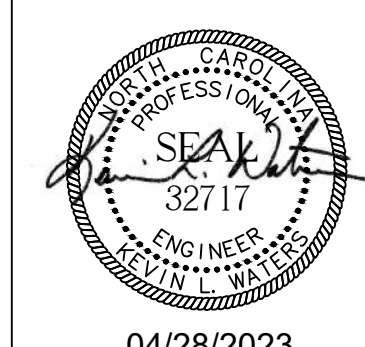
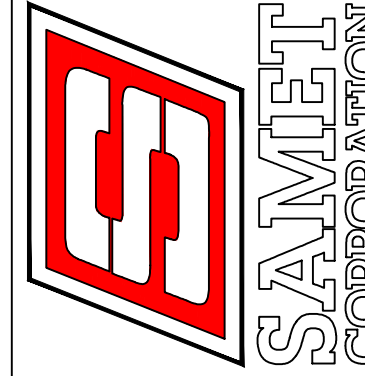


- NOTE:**
- RECONNECT LIQUAS REFRIGERATION LINES
  - RECONNECT POWER
  - RECONNECT TRAPPED CONDENSATE DRAIN

**6 TYPICAL FAN COIL DETAIL**  
NTS



**7 TYPICAL DUCTSOX CABLE HANGER DETAIL**  
NTS



04/28/2023

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SHEET NUMBER:

FOR CONSTRUCTION

## 2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - ELECTRICAL SUMMARY

- C401 METHOD OF COMPLIANCE**
- 2018 NCECC CHAPTER 4  NC SPECIFIC COMCHECK PROVIDED  
 N/A BASED ON PROJECT SCOPE  ASHRAE 90.1-2013

- C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS**
- C406.2 EFFICIENT MECH EQUIPMENT  C406.5 ON-SITE RENEWABLE ENERGY  
 C406.3 REDUCED LTG DENSITY  C406.6 DEDICATED OA SYSTEM  
 C406.4 ENHANCED DIGITAL LTG CNTLS  C406.7 HI-EFF SERVICE WTR HTG  
 NOT APPLICABLE BASED ON PROJECT SCOPE  C406.7.1 WTR HTG LOAD FRACTION

- C405.2 - LIGHTING CONTROLS (MANDATORY REQUIREMENTS):**
- LIGHTING SYSTEMS ARE PROVIDED WITH CONTROLS AS REQUIRED PER SECTION C405.2, EXCEPT WHERE EXEMPT.  
 NOT APPLICABLE

- C405.3 - EXIT SIGNS (MANDATORY REQUIREMENTS):**
- INTERNALLY ILLUMINATED EXIT SIGNS DO NOT EXCEED 5 WATTS PER SIDE.  
 NOT APPLICABLE

- C405.4 - INTERIOR LIGHTING POWER REQUIREMENTS (PRESCRIPTIVE) (NON-EXEMPT):**
- NOT APPLICABLE PER 2018 NCECC C503.1, EXCEPTION 2.G.

**C405.4.1 - TOTAL CONNECTED INTERIOR LIGHTING POWER:**  
 .XXX,XXX WATTS SPECIFIED  
 XX % REDUCTION OF SPECIFIED VS. ALLOWED  
 (APPLICABLE IF C406.1.2 IS SELECTED)

**C405.4.2 - TOTAL ALLOWABLE INTERIOR LIGHTING POWER:**  
 METHOD OF COMPLIANCE:  
 BUILDING AREA METHOD  SPACE-BY-SPACE METHOD  
 .XXX,XXX WATTS ALLOWED

- C405.5.1 - EXTERIOR BUILDING LIGHTING POWER (NON-EXEMPT):**

NOT APPLICABLE  
 TOTAL CONNECTED EXTERIOR LIGHTING POWER:  
 .XXX,XXX WATTS SPECIFIED

TOTAL ALLOWABLE EXTERIOR LIGHTING POWER:  
 .XXX,XXX WATTS ALLOWED

- C405.6 - ELECTRICAL ENERGY CONSUMPTION (DWELLING UNITS):**
- SEPARATE ELECTRICAL METERING HAS BEEN PROVIDED FOR EACH DWELLING UNIT IN GROUP R-2 BUILDINGS.  
 NOT APPLICABLE

- C405.7 - ELECTRICAL TRANSFORMERS (MANDATORY REQUIREMENTS):**
- ELECTRICAL TRANSFORMERS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.7, EXCEPT WHERE EXEMPT.  
 NOT APPLICABLE

- C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS):**
- ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.  
 NOT APPLICABLE

- C408 - SYSTEM COMMISSIONING:**
- PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.  
 PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

### SYMBOL SCHEDULE POWER

SYMBOL	DESCRIPTION
	WIRING SYSTEM CONCEALED IN WALL OR CEILING. WHEN SHOWN, CROSS LINES INDICATE NUMBER OF WIRES. (GROUND WIRES ARE NOT SHOWN)
	WIRING SYSTEM CONCEALED IN OR UNDER SLAB OR UNDERGROUND.
	WIRING SYSTEM EXPOSED.
	CONDUIT TURNED DOWN TO FLOOR BELOW.
	CONDUIT TURNED UP TO FLOOR ABOVE.
	BRANCH CIRCUIT HOMERUN TO PANEL.

### SYMBOL SCHEDULE POWER LEGEND

SYMBOL	DESCRIPTION
	JUNCTION BOX WITH CONNECTION TO EQUIPMENT SERVED. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING.
	208/120V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL AT 6'-6" AFF.
	480V/277V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL AT 6'-6" AFF.
	FUSED HEAVY DUTY DISCONNECT SWITCH. NUMERALS INDICATE SWITCH RATING. NEMA 1 ENCLOSURE, UNLESS OTHERWISE NOTED. UNSHADED INDICATES NON-FUSED.

### ELECTRICAL FIXTURES LEGEND - COMMERCIAL

SYMBOL	DESCRIPTION
	WEATHERPROOF GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX, CORROSION RESISTANT, WITH IN-USE COVER.

### EXISTING/DEMOLITION LEGEND

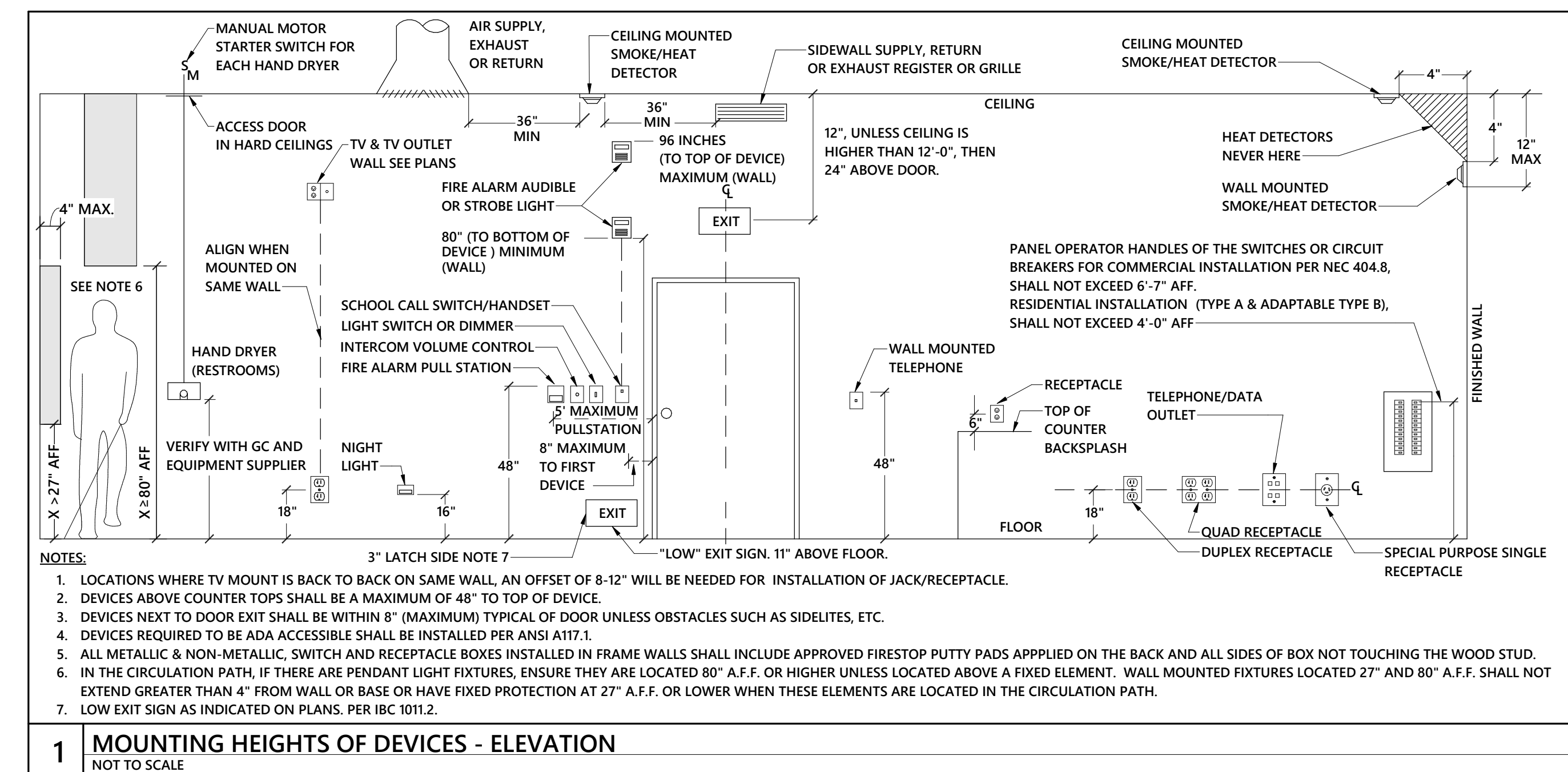
SYMBOL	DESCRIPTION
	HALFTONE SYMBOL INDICATES EXISTING
	DASHED SYMBOL INDICATES REMOVED

### NFPA FIRE ALARM LEGEND

SYMBOL	DESCRIPTION
	DUCT SMOKE DETECTOR (NFPA 72, SECTION 17.7.5.5). COORDINATE EXACT LOCATION WITH DUCT.

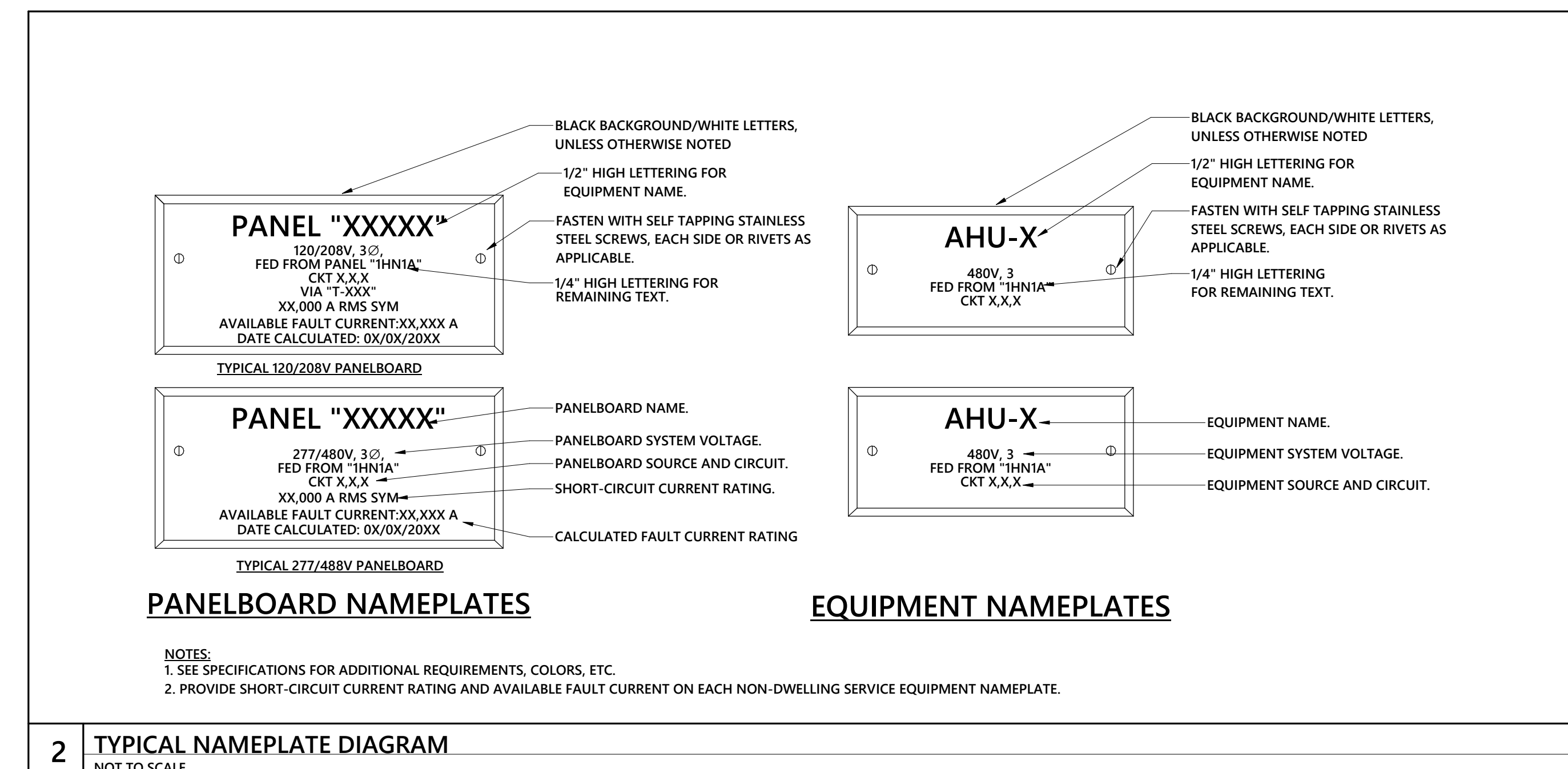
### ELECTRICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
E0.1	ELECTRICAL LEGEND AND NOTES
E0.2	ELECTRICAL SPECIFICATIONS
E2.1	LEVEL 1 POWER FLOOR PLAN
E6.1	ELECTRICAL DETAILS
E7.1	ELECTRICAL DIAGRAMS



### 1 MOUNTING HEIGHTS OF DEVICES - ELEVATION

NOT TO SCALE



### 2 TYPICAL NAMEPLATE DIAGRAM

NOT TO SCALE

MK	DATE	DESCRIPTION
		REVISIONS

DATE	05/05/2023
DRAWN BY	SAS
CHECK BY	ZFK
JOB NO.	22-0419
SHEET	

- 1. GENERAL:**
- THE WORK COVERED BY THESE SPECIFICATIONS CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT, MATERIALS, AND SUPPLIES AS NECESSARY FOR THE COMPLETE AND SATISFACTORY OPERATING ELECTRICAL SYSTEMS AS SHOWN ON THE PLANS.
  - ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE 2020 NATIONAL ELECTRICAL CODE, NFPA, NC STATE BUILDING CODE, AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.
  - CONTRACTOR SHALL OBTAIN AND PAY FOR ALL ELECTRICAL PERMITS AND INSPECTION FEES.
  - ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED BY THE UNDERWRITER'S LABORATORIES, INC. OR BY A STATE APPROVED THIRD PARTY TESTING AGENCY FOR THE USE INTENDED WHERE A STANDARD FOR SUCH MATERIALS AND USE EXISTS. ALL ITEMS OF THE SAME TYPE AND RATING SHALL BE IDENTICAL AND OF THE SAME MANUFACTURER.
  - CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CATALOG DATA IN ELECTRONIC FORMAT (PDF) FOR ALL ELECTRICAL ITEMS IN THE SCOPE OF WORK, INCLUDING, BUT NOT LIMITED TO, RACEWAYS, BOXES, FITTINGS, CONDUCTORS, DISCONNECTS, FIRE ALARM, ETC. FOR APPROVAL AS APPLICABLE FOR THE PROJECT. ONE COMPLETE SET OF APPROVED SUBMITTALS SHALL BE MAINTAINED AT THE JOB SITE.
  - ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH THE BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, CONDUIT, WIRING, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, METHODS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COSTS ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED AFTER BIDS HAVE BEEN ACCEPTED AND ALL COSTS WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. CREDITS SHALL BE GIVEN TO THE OWNER WHERE SUCH EQUIPMENT AND METHODS RESULT IN LESS EXPENSE TO THE CONTRACTOR.
  - ONE COMPLETE SET OF THE LATEST CONSTRUCTION PLANS OF ALL TRADES SHALL BE MAINTAINED AT THE JOB SITE. IN ADDITION, ALL ADDENDUMS, BULLETINS, AND/OR SKETCHES SHALL BE INCORPORATED INTO THE ON-SITE CONSTRUCTION PLANS AS THE JOB PROGRESSES.
  - COMPLETELY ADEQUATE HOUSING SHALL BE PROVIDED FOR ALL MATERIALS STORED ON JOB SITE. ONLY CONDUIT MAY BE STORED OUTSIDE, BUT NOT IN CONTACT WITH THE GROUND.
  - THE CONDUIT AND NEUTRAL SYSTEM SHALL BE GROUNDED AT THE MAIN SERVICE EQUIPMENT. GROUNDING ELECTRODE SYSTEM SHALL BE INSTALLED PER NEC 250.
  - WIRING SHALL BE TESTED FOR CONTINUITY AND GROUNDS BEFORE BEING ENERGIZED. FAULTY WIRING SHALL BE REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER.
  - PROVIDE ALL CUTTING AND PATCHING FOR INSTALLATION OF WORK AND REPAIR ANY DAMAGE DONE.
  - THE ELECTRICAL CONTRACTOR SHALL CONNECT ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS (UNLESS OTHERWISE NOTED), EXCEPT FOR CONTROL WIRING FOR EQUIPMENT NOT PROVIDED BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING FOR SUCH EQUIPMENT SHALL BE PROVIDED BY THE RESPECTIVE DISCIPLINE.
  - ALL ELECTRICAL JUNCTION BOXES, SWITCHGEAR, ETC. SHALL BE LABELED ACCORDING TO PANEL AND CIRCUIT NUMBERS.
  - UPON COMPLETION OF WORK, CONTRACTOR SHALL PRESENT ENGINEER WITH CERTIFICATE OF APPROVAL FROM LOCAL INSPECTOR AND/OR AUTHORITY HAVING JURISDICTION BEFORE WORK WILL BE APPROVED FOR FINAL PAYMENT.
  - CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR A PERIOD OF ONE YEAR EFFECTIVE THE DATE THE PROJECT IS ACCEPTED BY THE OWNER. ANY IMPERFECT MATERIALS OR WORKMANSHIP SHALL BE REPLACED WITHOUT ADDED COST TO THE PROJECT.
  - IT SHALL NOT BE THE INTENT OF ISSUED PLANS AND/OR SPECIFICATIONS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. THE ELECTRICAL CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL NECESSARY ITEMS FOR A COMPLETE AND OPERATING SYSTEM.
  - THE WORD "PROVIDE" MEANS THAT THIS CONTRACTOR SHALL FURNISH, FABRICATE, ERECT, CONNECT, AND COMPLETELY INSTALL SYSTEMS IN PROPER OPERATING CONDITION. ALL LABOR, PRODUCT OPTIONS, ACCESSORIES AND INCIDENTAL MATERIALS REQUIRED SHALL BE INCLUDED AS PART OF THIS WORK TO COMPLETE THE INSTALLATION.
  - THE WORD "CONNECT" MEANS THAT THIS CONTRACTOR SHALL PROVIDE (SEE DEFINITION ABOVE) ALL DISCONNECTING MEANS, OVERCURRENT PROTECTION AND WIRING REQUIRED TO PLACE THE EQUIPMENT AND SYSTEMS IN PROPER OPERATING CONDITION AND TO COMPLY WITH CODE REQUIREMENTS.
  - CONTRACTOR SHALL COORDINATE THE ROUGH-IN OF ALL OUTLET LOCATIONS WITH ARCHITECTURAL FLOOR PLANS, ELEVATIONS, AND MILLWORK SHOP DRAWINGS PRIOR TO ROUGH-IN.
  - ELECTRICAL CONTRACTOR SHALL NOT SCALE PLANS. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, UNLESS OTHERWISE NOTED.
  - IF DURING THE COURSE OF WORK, THE CONTRACTOR DISCOVERS A PROBLEM WITH THE PERFORMANCE OF THE INSTALLATION RELATIVE TO THE PLANS AND SPECIFICATIONS, THE NEC, OR OTHER CODES OR REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY BRING THE PROBLEM TO THE ATTENTION OF THE ARCHITECT AND/OR ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK.
  - WHERE THERE ARE CONFLICTS BETWEEN THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL BRING THE ISSUE TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK OR ORDERING ANY MATERIALS. NO ADDITIONAL COSTS SHALL BE WARRANTED WITHOUT A CHANGE TO THE PROJECT SCOPE.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PROVIDING TEMPORARY POWER AND LIGHTING FOR ALL TRADES. AT NO TIME SHALL EXISTING BUILDING POWER SYSTEMS BE UTILIZED WITHOUT WRITTEN PERMISSION FROM THE OWNER.
  - THE CONTRACTOR SHALL PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY PLANNED UTILITY OUTAGES. WRITTEN AUTHORIZATION FROM THE OWNER SHALL BE PROVIDED PRIOR TO ANY OUTAGE. ALL PLANNED UTILITY OUTAGES SHALL BE COORDINATED WITH THE OWNER TO OCCUR DURING NON-OPERATING TIMES, INCLUDING NIGHTS, WEEKENDS AND HOLIDAYS. ALL PLANNED UTILITY OUTAGES SHALL INCLUDE PROVISIONS FOR PROPER BACK-UP OF ALL LIFE-SAFETY SYSTEMS AND INCLUDE AN APPROVED FIRE-WATCH PROGRAM AS REQUIRED BY THE LOCAL FIRE MARSHALL.
  - EACH BIDDER SHALL VISIT THE JOB SITE PRIOR TO BIDDING TO FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS AND TO ASCERTAIN THE EXTENT OF WORK REQUIRED. FAILURE TO VISIT SITE SHALL NOT EXCUSE CONTRACTOR FROM PERFORMING REQUIRED WORK NOR SHALL IT BE AN ACCEPTABLE REASON FOR REQUESTING ADDITIONS TO THE CONTRACT.
- 2. RACEWAY:**
- CONDUIT SHALL BE MANUFACTURED BY ALLIED, WHEATLAND, REPUBLIC CONDUIT, WESTERN TUBE, OR APPROVED EQUIVALENT.
  - FOR INTERIOR WORK, CONDUIT SHALL BE ZINC COATED EMT EXCEPT WHERE NOT PERMITTED BY CODE. USE SCHEDULE 40 PVC BELOW CONCRETE SLAB, IN DUCTBANKS, AND FOR EXTERIOR WORK WHERE NOT SUBJECT TO DAMAGE. USE IMC WHERE SUBJECT TO PHYSICAL DAMAGE.
  - EMT FITTINGS SHALL BE COMPRESSION GLAND TYPE, OF MALLEABLE STEEL. CONNECTORS SHALL HAVE INSULATED THROATS. CAST, SET SCREW, OR INDENTER TYPE FITTINGS ARE NOT ACCEPTABLE. ALL FITTINGS FOR EMT SHALL BE MADE OF STEEL.
  - ALL RACEWAY SHALL BE RUN CONCEALED, UNLESS OTHERWISE NOTED. FISH ALL NEW OUTLETS IN EXISTING WALLS, WHERE POSSIBLE. ALL RUNS SHALL BE NEAT AND SQUARE.
  - LOW VOLTAGE CABLING NOT SPECIFIED TO BE INSTALLED IN CONDUIT, SHALL BE INSTALLED IN A J-HOOK SYSTEM CONSISTING OF MINIMUM 2" DIAMETER HOOKS LOCATED ON 3'-0" CENTERS IN ALL ACCESSIBLE CEILING. WHERE THERE ARE INACCESSIBLE CEILINGS, PROVIDE CONDUIT FOR ENTIRE LENGTH OF INACCESSIBILITY.
  - RACEWAYS USED FOR LOW VOLTAGE SYSTEMS SUCH AS FIRE ALARM, SHALL BE PROVIDED WITH INSULATED THROAT BUSHINGS AT EACH CONDUIT TERMINATION. THESE BUSHINGS SHALL BE INSTALLED PRIOR TO PULLING LOW VOLTAGE CABLES.
  - RACEWAY PENETRATIONS THROUGH FLOOR SLABS AND FIRE-RATED WALLS SHALL BE FILLED WITH IMPERVIOUS, NON-SHRINK GROUT SUFFICIENTLY TIGHT TO PREVENT THE TRANSFER OF SMOKE, WATER, AND DUST. ROOF PENETRATIONS SHALL BE THROUGH THE EQUIPMENT ROOF CURB.
  - SUPPORT ALL CONDUIT WITH STRAPS AND CLAMPS.
  - ALL CONDUIT SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES, WHETHER EXPOSED OR NOT AND SUPPORTED FROM STRUCTURE AND PROPERLY SECURED.
  - WHERE CONDUITS PASS THROUGH A BUILDING EXPANSION JOINT, PROVIDE GALVANIZED EXPANSION FITTINGS WITH BONDING JUMPERS.
  - PROVIDE MINIMUM 210# TENSILE NYLON PULL CORD AND NYLON BUSHINGS IN ALL EMPTY RACEWAYS.
  - LIQUID-TIGHT METAL CONDUIT SHALL ONLY BE USED FOR FINAL CONNECTIONS TO EQUIPMENT AND ALL OTHER ROTATING AND VIBRATING EQUIPMENT, MAXIMUM LENGTH OF 3'-0".
  - FLEXIBLE METAL CONDUIT, MINIMUM SIZE 3/8", SHALL ONLY BE USED FOR FINAL CONNECTION TO LIGHTING FIXTURES, MAXIMUM LENGTH OF 6'-0".
  - PROVIDE PULL BOXES, SUCH THAT NO SINGLE CONDUIT RUN HAS BENDS IN EXCESS OF 360°. PULL BOXES SHALL BE SUITABLE AND APPROVED FOR THE INTENDED USE. WHERE CONDUITS PASS UNDER PAVED AREAS, THEY SHALL BE RGS.
  - ALL CONDUIT BENDS/ELBOWS EMERGING FROM UNDERGROUND SHALL BE IMC AND SHALL EXTEND A MINIMUM OF 18" BELOW GRADE.
  - ALL CONDUITS INSTALLED UNDERGROUND OR IN CONCRETE SHALL HAVE JOINTS MADE WATERTIGHT BY USE OF POLYTETRAFLUOROETHYLENE TAPE.
  - THE USE OF AC OR NM CABLE IS NOT PERMITTED.
  - MC CABLE MAY ONLY BE UTILIZED WHERE PERMITTED BY CODE AND IT SHALL ONLY BE ALLOWED WHERE CONCEALED BEHIND HARD WALLS AND HARD CEILINGS. MC CABLE SHALL NOT BE EXPOSED.

- OUTLET BOXES:**
  - JUNCTION AND PULL BOXES SHALL BE CODE GAUGE GALVANIZED STEEL. ACCEPTED MANUFACTURERS SHALL BE STEEL CITY (THOMAS & BETTS), RACO, CROUSE-HINDS, APPLETON (EMERSON), OR APPROVED EQUIVALENT.
  - OUTLET BOXES SHALL NOT BE MOUNTED BACK TO BACK IN COMMON WALLS.
  - ATTACH EMT WITH CONNECTORS HAVING INSULATED THROAT.
  - ATTACH BOXES TO STUD WORK USING CADDY BAR STRAPS THAT CONNECT TO TWO ADJACENT METAL STUDS TO PREVENT TWISTING OF BOX IN WALL.
  - ALL OUTLET BOXES INCLUDING TELEPHONE, CABLE TV, AND COMPUTER) SHALL HAVE COVER PLATES, BLANK IF NOT USED.
  - ALL EXTERIOR BOXES SHALL BE WATER-TIGHT.
- CONDUCTORS:**
  - CONDUCTORS SHALL BE MANUFACTURED BY SOUTHWIRE (SIMPULL), ENCORE (SUPERSLUICK), UNITED COPPER (SLK), CERRO (SLP), OR APPROVED EQUAL, "PRE-LUBRICATED" BY THE MANUFACTURER.
  - ALL CONDUCTORS SHALL BE COPPER, RATED 75° C WET/DRY EXCEPT WHERE OTHERWISE NOTED OR REQUIRED BY U.L. OR OTHER CODES.
  - ALL CONDUCTORS SHALL BE SINGLE INSULATED CONDUCTOR, THHN/THWN-2. SIZES #10 AWG AND SMALLER SHALL BE SOLID, SIZES #8 AWG AND LARGER SHALL BE STRANDED.
  - BRANCH CIRCUITS SHALL NOT BE SMALLER THAN #12 AWG. CONTROL WIRING MAY BE #14 AWG.
  - CONDUCTORS SHALL BE COLOR CODED BLACK/RED/BLUE FOR 120/208 VOLT SYSTEMS AND BROWN/ORANGE/YELLOW FOR 277/480 VOLT SYSTEMS FOR A, B, AND C PHASES, RESPECTIVELY. NEUTRAL SHALL BE WHITE FOR 120/208 VOLT SYSTEMS AND NATURAL GRAY FOR 277/480 VOLT SYSTEMS. GROUND CONDUCTOR SHALL BE GREEN ON ALL SYSTEMS. ALL CONDUCTOR SIZES SHALL HAVE COLOR-CODED INSULATION. THE USE OF COLORED TAPE ON LARGER WIRE SIZES SHALL NOT BE ALLOWED.
  - INSULATION SHALL BE DUAL RATED TYPE THHN/THWN-2 FOR FEEDERS AND BRANCH CIRCUITS. FIXTURE TAPS SHALL BE #12 THHN/THWN-2 IN FLEX WITH GREEN #12 AWG GROUNDING CONDUCTOR.
  - ALL CONDUCTORS SHALL BE IN CONDUIT.
  - WIRING TO LIGHTING FIXTURES SHALL BE AS REQUIRED BY UL LABEL.
  - MULTI-WIRE BRANCH CIRCUITS SHALL NOT BE ALLOWED.
  - JOINTS IN #10 AWG AND SMALLER SHALL BE MADE UP WITH CRIMPED CONNECTORS WITH INSULATING CAPS (NO TAPE) OR WIRENUTS (MAXIMUM OF 3 CONDUCTORS UNDER ANY CONNECTOR OR WIRENUT). LARGER WIRE SHALL USE SPLIT BOLTS OR BOLTED CLAMPS.
  - ALL WIRING LUGS THROUGHOUT THE PROJECT, INCLUDING, BUT NOT LIMITED TO, BREAKERS, PANELBOARD/SWITCHBOARD LUGS, SAFETY SWITCH LUGS, MOTOR STARTER LUGS, TRANSFORMERS LUGS, WIRING DEVICE TERMINALS, AND ALL EQUIPMENT LUGS/TERMINALS SHALL BE RATED FOR USE WITH 75 DEGREE INSULATED CONDUCTORS AT THEIR 75 DEGREE AMPACITY AND SHALL BE SIZED AND SELECTED TO MATCH THE CONDUCTOR SIZE AND MATERIAL.
  - CIRCUIT JOINTS SHALL NOT BE MADE ON DEVICE TERMINALS.
  - WIRE WITHIN PANELBOARDS SHALL BE NEATLY TRAINED, SQUARED, BUNCHED, AND TAGGED.
  - GROUND ALL EQUIPMENT PER NEC ARTICLE 250. BOND WHERE CONDUITS ENTER ENCLOSURES THROUGH CONCENTRIC KNOCKOUTS. ALL FLEX, INCLUDING FIXTURE TAPS, SHALL INCLUDE GREEN GROUNDING CONDUCTOR, #12 AWG MINIMUM. PROVIDE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT AND FOR EACH CIRCUIT, SIZED PER NEC 250-122.
  - ALL CONDUCTORS INSTALLED IN VERTICAL RACEWAYS SHALL BE SUPPORTED AT INTERVALS AS REQUIRED PER NEC 300-19.
  - THE ELECTRICAL CONTRACTOR SHALL FOLLOW AND APPLY THE TABLE BELOW, REGARDLESS OF THE PANEL SCHEDULE INDICATES, FOR SIZING ALL 120V & 277V, 20 AMP BRANCH CIRCUITS (COPPER CONDUCTORS) TO ALLOW A MAXIMUM OF 3% VOLTAGE DROP FROM THE CIRCUIT BREAKER TO THE FIRST DEVICE ON THE BRANCH CIRCUIT AND ACHIEVE A MAXIMUM OF 3% VOLTAGE DROP ACROSS THE ENTIRE BRANCH CIRCUIT:

VOLTAGE	CONDUCTOR LENGTH *	BRANCH CIRCUIT
120	0' - 50'	#12
120	51' - 90'	#10
120	91' - 140'	#8
120	141' - 255'	#6
277	0' - 125'	#12
277	126' - 200'	#10
277	201' - 330'	#8
277	331' - 525'	#6

\* - THE LENGTH IS MEASURED FROM THE CIRCUIT BREAKER TO THE FIRST DEVICE WHICH THE BRANCH CIRCUIT SERVES. WHERE THE DISTANCE EXCEEDS ABOVE, CONSULT WITH THE ENGINEER.
- WIRING DEVICES:**
  - WIRING DEVICES SHALL BE SPECIFICATION GRADE, MINIMUM, EQUAL TO COOPER QUALITY INDICATED BELOW OR AS MANUFACTURED BY HUBBELL, LEGRAND-PASS & SEYMOUR, LEVITON, OR APPROVED EQUAL, UNLESS OTHERWISE NOTED.  
  
SWITCHES (120/277V) SHALL BE AS FOLLOWS:  
  

SINGLE-POLE 20 AMP	COOPER AH1221
20 AMP DUPLEX	COOPER S352
20 AMP DUPLEX GFCCI	COOPER SGF20F
20 AMP DUPLEX TAMPER	COOPER TRS362
20 AMP DUPLEX GFCCI-TAMPER	COOPER TRSG20F

THE PART NUMBERS ABOVE ARE FOR WIRING DEVICE TYPE ONLY. SEE BELOW FOR WIRING DEVICE COLOR AND PLATE MATERIAL/COLOR.
  - SEE MOUNTING HEIGHT ELEVATION DETAIL FOR STANDARD MOUNTING HEIGHTS OF ALL DEVICES, UNLESS OTHERWISE NOTED.
  - ALL WIRING DEVICES (SWITCHES AND RECEPTACLES) AND PLATES SHALL MATCH EXISTING IN MATERIAL AND COLOR, UNLESS OTHERWISE NOTED. COVER PLATES IN MASONRY WALLS SHALL BE JUMBO SIZE.
  - EACH DUPLEX RECEPTACLE INDICATED TO BE ON A DEDICATED CIRCUIT SHALL BE 20 AMP TYPE.
  - ADJACENT DEVICES SHALL HAVE A COMMON WALL PLATE.
  - WEATHERPROOF COVERS SHALL BE "WHILE-IN-USE" SO PLUGS MAY BE INSTALLED WITHOUT COMPROMISING THE WP FUNCTION. COOPER #WU-2 DOUBLE-GANG WITH CLEAR COVER OR APPROVED EQUAL.
  - A MAXIMUM OF 10 GENERAL PURPOSE RECEPTACLES SHALL BE ON EACH BRANCH CIRCUIT.
  - GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FOR PERSONNEL SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.8, INSTALLED IN A READILY ACCESSIBLE LOCATION. WHERE A DEVICE LOCATION IS NOT ACCESSIBLE, THE GFCI PROTECTION SHALL BE PROVIDED WITH THE BREAKER SERVING THE DEVICE.
  - ALL GFCI RECEPTACLES SHALL HAVE AUTO-MONITORING / SELF-TEST FUNCTION AND REVERSE LINE-LOAD MISFIRE FUNCTION AND MEET ALL REQUIREMENTS OF UL 943 (LATEST EDITION).
  - TAMPER-RESISTANT RECEPTACLES SHALL BE PROVIDED FOR ALL AREAS PER NEC 406.12, INCLUDING CHILD-CARE FACILITIES, PRESCHOOL AND EDUCATION FACILITIES, BUSINESS OFFICES/CORRIDORS, ASSEMBLY OCCUPANCIES INCLUDING PLACES OF AWAITING TRANSPORTATION/GYMNASIUMS/AUDITORIUMS.
- SUPPORTS:**
  - ALL EQUIPMENT SHALL BE ADEQUATELY SUPPORTED FROM STRUCTURE.
  - INSERTS IN MASONRY SHALL BE LEAD OR FIBER IN DRILLED HOLES, OR CAST IN PLACE.
  - NAILS OR POWDER ACTUATED FASTENERS SHALL NOT BE USED.
  - EMT/IMC/RGS SUPPORTS SHALL BE A MAXIMUM OF 8'-0" APART AND A MAXIMUM OF 3'-0" FROM BOXES.

- PAINTING:**
  - SUITABLE FINISH COAT SHALL BE PROVIDED FOR ALL EQUIPMENT. PANEL TUBS, COVERS, ETC. SHALL BE PRIMED AND ENAMELED TO BLEND WITH ADJACENT SURFACES, OR SHALL BE MANUFACTURER'S STANDARD COLOR BAKED ENAMEL FINISH, OR AS DIRECTED BY THE ARCHITECT.
  - CONTRACTOR TO PAINT WHERE EXISTING EXPOSED PANELBOARDS, SURFACE RACEWAY, SURFACE BOXES, ETC. HAVE BEEN REMOVED DURING THE DEMOLITION PHASE, EITHER FOR TEMPORARY WORK OR PERMANENTLY.
- EQUIPMENT IDENTIFICATION:**
  - PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR ALL ELECTRICAL EQUIPMENT SUPPLIED FOR THE PROJECT, INCLUDING BUT NOT LIMITED TO, WIRING TROUGHS, SAFETY SWITCHES, DISCONNECTS, TRANSFORMERS, PANELBOARDS, SWITCHBOARDS, SWITCHGEARS, MOTOR CONTROL CENTERS (MCC), BUSWAYS, GENERATORS, AUTOMATIC TRANSFER SWITCHES (ATS), UNINTERRUPTIBLE POWER SUPPLY (UPS), POWER DISTRIBUTION UNITS (PDU), FLOOR/REMOTE DISTRIBUTION CABINETS (FDC/RDC), STATIC TRANSFER SWITCHES (STS), ETC. NAMEPLATE SHALL INDICATE THE DEVICE NAME, SYSTEM VOLTAGE (VOLTAGE/PHASE/WIRE), AND UPSTREAM DEVICE AND CIRCUIT. PROVIDE NAMEPLATES FOR CIRCUIT BREAKERS IN SWITCHGEARS, SWITCHBOARDS AND DISTRIBUTION PANELS.
  - NAMEPLATE COLORS SHALL BE AS FOLLOWS:  

120/208V EQUIPMENT	BLUE SURFACE WITH WHITE CORE
277/480V EQUIPMENT	BLACK SURFACE WITH WHITE CORE
FIRE ALARM SYSTEMS	BRIGHT RED SURFACE WITH WHITE CORE

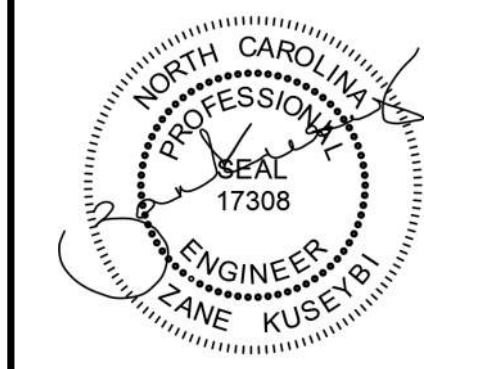
NAMEPLATES UP TO 4 SQUARE INCHES SHALL NOT BE LESS THAN 1/16" THICK. NAMEPLATES LARGER THAN 4 SQUARE INCHES SHALL NOT BE LESS THAN 1/8" THICK.  

C. LETTERING HEIGHT SHALL BE 1/2" MINIMUM.
D. NAMEPLATES SHALL BE ATTACHED WITH SELF-DRILLING/SELF-TAPPING SCREWS, EXCEPT RIVETS SHALL BE USED WHERE END OF SCREW IS NOT PROTECTED. QUANTITY AS FOLLOWS: UP TO 5 SQUARE INCHES:     2 SCREWS ABOVE 5 TO 12 SQUARE INCHES:     4 SCREWS ABOVE 12 SQUARE INCHES:     6 SCREWS
- DISCONNECTS:**
  - DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE IN NEMA 1 ENCLOSURES, UNLESS OTHERWISE NOTED, FUSED OR NON-FUSED AS INDICATED. SWITCHES SHALL HAVE REJECTION-TYPE FUSE CLIPS. SWITCHES SHALL BE BY Eaton, SQUARE-D, GENERAL ELECTRIC, OR APPROVED EQUAL.
  - FUSES LESS THAN 60A SHALL BE CLASS RK5, DUAL-ELEMENT, TIME-DELAY WITH INDICATION.
  - FUSES GREATER THAN 60A SHALL BE CLASS J, DUAL-ELEMENT, TIME-DELAY WITH INDICATION.
  - A SET OF 3 SPARE FUSES OF EACH SIZE AND TYPE SHALL BE FURNISHED TO THE OWNER.
- FIRE ALARM SYSTEM:**
  - NEW DEVICES SHALL BE CONNECTED TO THE EXISTING FIRE ALARM SYSTEM IN COMPLIANCE WITH ALL APPLICABLE NFPA 72 AND OTHER STANDARDS AS WELL AS THE AMERICAN S COMPLIANCE ACT (ADA). ALL FINAL CONNECTIONS, TESTING AND ADJUSTMENTS SHALL BE PERFORMED BY OR UNDER DIRECT SUPERVISION OF AN AUTHORIZED FACTORY REPRESENTATIVE. NEW DEVICES SHALL BE COMPATIBLE WITH THE EXISTING FIRE ALARM SYSTEM. THE CONTRACTOR SHALL FIELD VERIFY EXACT SYSTEM MANUFACTURER AND TYPE AND CAPABILITY TO MEET THE INTENT INDICATED ON THE DRAWINGS.
  - INITIATING DEVICE ACTIVATION SHALL CAUSE OPERATION OF THE PROPER ALARM CIRCUIT IN THE CONTROL PANEL, AND OPERATE ALL AUDIBLE AND VISUAL INDICATING ALARMS. ALL AIR HANDLING UNITS SHALL BE STOPPED UPON ANY ALARM INPUT. EACH AIR HANDLER UNIT SHALL BE PROVIDED WITH A SYSTEM CONTROLLED RELAY TO EFFECT SHUTDOWN. ALL ALARM DEVICES AND LAMPS SHALL CONTINUE TO OPERATE UNTIL THE INITIATING DEVICE IS RESET. SUBSEQUENT ALARMS SHALL RESOUND THE SYSTEM. AN AUDIBLE AND VISUAL SIGNAL SHALL INDICATE SYSTEM TROUBLE. THE CONTROL PANEL SHALL PROVIDE FOR ACTIVATING A UL LISTED CENTRAL STATION SIGNAL FOR NOTIFYING THE FIRE DEPARTMENT.
  - MANUAL STATIONS SHALL BE NON-CODED, WITH PULL LEVER AND GLASS ROD, SEMI-FLUSH MOUNTED. COMBINATION LIGHT AND HORN SIGNALS SHALL BE FLUSH MOUNTED. WIRING SHALL BE IN CONDUIT AS PREVIOUSLY SPECIFIED, #14 AWG MINIMUM, THHN. ALL J-BOXES USED FOR THE FIRE ALARM SYSTEM SHALL BE PAINTED RED.
  - SPRINKLER SYSTEM TAMPER SWITCHES SHALL BE CONNECTED INTO A COMMON ZONE WHICH SHALL DISTINGUISH BETWEEN A CONDUIT FAULT AND A CLOSED VALVE. A CLOSED VALVE SHALL BE INDICATED AS AN ALARM CONDITION, BUT WILL NOT ACTIVATE THE AUDIO-VISUAL DEVICES AND SHALL CAUSE A SUPERVISORY SIGNAL TO BE TRANSMITTED TO THE CENTRAL STATION.
  - CONDUCTORS SHALL BE PLENUM-RATED AND INSTALLED IN CONDUIT AND INSTALLED IN COMPLIANCE WITH NFPA 70, ARTICLE 760. IN ADDITION TO WIRING METHODS 300.4.
  - ALL FIRE ALARM WIRING SHALL BE CLASS B.
  - PROVIDE ALL REQUIRED MODULES, POWER EXTENDERS, PROGRAMMING, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.
  - SUBMIT FIRE ALARM SHOP DRAWINGS CONSISTING OF PRODUCT DATA, TO THE ENGINEER AND FOR APPROVAL.
  - FILL OUT NFPA 72 CERTIFICATION REPORT AND SUBMIT TO ENGINEER AND AUTHORITY HAVING JURISDICTION.
  - WARRANTY - ALL WORK PERFORMED AND ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE FREE FROM DEFECTS AND SHALL REMAIN SO FOR A PERIOD OF AT LEAST TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY THE PROFESSIONAL ENGINEER AND/OR OWNER. THE FULL COST OF MAINTENANCE, LABOR, AND MATERIALS REQUIRED TO CORRECT ANY DEFECT DURING THIS TWO YEAR PERIOD SHALL BE IMMEDIATELY CORRECTED AT NO ADDITIONAL COST TO THE OWNER. ANY DEFECTS THAT RENDER THE SYSTEM INOPERATIVE SHALL BE REPAIRED WITHIN 24 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR. OTHER DEFECTS SHALL BE REPAIRED WITHIN 48 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR.
  - PROVIDE ALL REPROGRAMMING AND/OR REWORK AND/OR REPLACEMENT OF EXISTING FIRE ALARM PANEL AS REQUIRED.

- FIRE STOPPING:**
  - ALL PENETRATIONS OF RATED ASSEMBLIES SHALL BE SEALED WITH RATED MATERIALS MEETING ASTM E-814.
  - PROVIDE FIRESTOPPING DEVICE(S) OR SYSTEM(S) WHICH HAVE BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814. INSTALL THE DEVICE(S) OR SYSTEM(S) IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE THE APPROPRIATE DEVICE(S) OR SYSTEM(S) WITH AN "F" RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED.
  - DEVICE(S) AND/OR SYSTEM(S) SHALL BE BY HILTI, 3M OR EQUIVALENT.
- ELECTRICAL COORDINATION WITH OTHER TRADES:**
  - THE ELECTRICAL CONTRACTOR SHALL CONNECT AND/OR PROVIDE FINAL CONNECTIONS TO ALL EQUIPMENT SUPPLIED BY OTHERS APPLICABLE TO THE PROJECT, INCLUDING BUT NOT LIMITED TO, MECHANICAL, PLUMBING, FIRE PROTECTION AND SUPPRESSION, OWNER FURNISHED, KITCHEN, LABORATORY, ETC. UNLESS OTHERWISE NOTED.
  - THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONNECTIONS PRIOR TO ROUGH-IN USING APPROVED CATALOG SHEETS AND SHOP DRAWINGS.
  - THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANUAL MOTOR STARTER SWITCHES, DISCONNECT SWITCHES, RECEPTACLES, ETC. TO MECHANICAL AND PLUMBING EQUIPMENT. ALL STARTERS, OTHER THAN MANUAL STARTER SWITCHES, SHALL BE PROVIDED BY OTHERS, BUT INSTALLED BY THE ELECTRICAL CONTRACTOR.
  - ALL DISCONNECT SWITCHES AND FUSE SIZES SHALL BE COORDINATED WITH SHOP DRAWINGS PRIOR TO ORDERING OR INSTALLING. ANY EQUIPMENT INSTALLED INCORRECTLY BECAUSE OF LACK OF COORDINATION WILL BE REMOVED AND INSTALLED CORRECTLY AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
  - THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT RUNS AND LIGHT FIXTURE LOCATIONS ABOVE THE CEILING WITH OTHER TRADES PRIOR TO INSTALLATION.
  - ALL DUCT SMOKE DETECTORS SHALL BE PROVIDED AND CONNECTED BY THE ELECTRICAL CONTRACTOR, BUT INSTALLED BY THE MECHANICAL CONTRACTOR.
  - THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY OUTLETS FOR HEAT TAPE CONNECTIONS FOR MECHANICAL SYSTEMS. PROVIDE CLASS B (30mA) GFCI PROTECTION ON THE BREAKER SUPPLYING THE HEAT TAPE.
  - THE ELECTRICAL CONTRACTOR SHALL PROVIDE 120V POWER AT EACH HVAC UNIT HAVING A CONTROLS POWER SUPPLY. CIRCUIT(S) SHALL BE DEDICATED 20A SERVING A MAXIMUM OF 10 HVAC UNITS PER CIRCUIT. COORDINATE ALL LOCATIONS WITH THE MECHANICAL CONTRACTOR.
- DEMOLITION NOTES:**
  - PARTIAL AND TOTAL DEMOLITION OF PORTIONS SHALL BE PERFORMED ALONG WITH ALL NECESSARY MODIFICATIONS TO THAT PORTION OF THE EXISTING BUILDING WHICH SHALL REMAIN SO THAT IT CONTINUES TO FUNCTION UNAFFECTED BY THE DEMOLITION AND ASSOCIATED NEW CONSTRUCTION.
  - WHERE THE DEMOLITION IS INDICATED AS PART OF THE CONTRACT DOCUMENTS, THE DRAWINGS IN THE AREAS OF WORK INVOLVED, HOWEVER, THE ELECTRICAL CONTRACTOR SHALL PERFORM WORK OUTSIDE THOSE AREAS SHOWN AS IS NECESSARY TO COMPLY WITH THE INTENT OF THIS SECTION.
  - THE ELECTRICAL CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE EXISTING BUILDING AND WITH THE WORK OF ALL OTHER TRADES AND INCLUDE ALL WORK NECESSARY TO COMPLY WITH THE INTENT OF THE DEMOLITION.
  - IT SHALL BE UNDERSTOOD THAT FIELD CONDITIONS MAY BE ENCOUNTERED DURING THE EXECUTION OF THIS CONTRACT WHICH WILL REQUIRE EXTENSION OR RELOCATION OF EXISTING SYSTEMS OR EQUIPMENT WHICH ARE NOT SPECIFICALLY SHOWN ON THE DRAWINGS, BUT WHICH ARE REQUIRED TO MEET THE STATED INTENT. THAT THE BUILDING CONTINUE TO FUNCTION UNAFFECTED BY THE DEMOLITION AND ASSOCIATED NEW CONSTRUCTION. THE ELECTRICAL CONTRACTOR SHALL INCLUDE SUCH WORK AS WOULD NORMALLY BE EXPECTED IN AN EXISTING BUILDING OF THIS AGE AND TYPE.
  - THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL TOOLS, EQUIPMENT, LABOR, ETC. IN ORDER TO ACCOMPLISH THE DEMOLITION PORTION OF THE PROJECT.
  - THE DEMOLITION OF CERTAIN AREAS OF THE EXISTING BUILDING SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE GENERAL CONTRACTOR TO DIFFERENTIATE THE SCOPE OF WORK BETWEEN SEPARATE TRADES.
  - THE ELECTRICAL CONTRACTOR SHALL INCLUDE COORDINATION WITH THE GENERAL CONTRACTOR AND SUCH DEMOLITION OF THE EXISTING ELECTRICAL SYSTEMS AS IS NECESSARY SO THAT THE DEMOLITION WORK OF THE GENERAL CONTRACTOR SHALL NOT DAMAGE THOSE PORTIONS OF THE ELECTRICAL SYSTEMS WHICH ARE TO REMAIN IN SERVICE, ARE TO BE REUSED, OR ARE TO BECOME THE PROPERTY OF THE OWNER.
  - TURN OVER TO OWNER UPON REQUEST OR AS NOTED, ITEMS SHOWN AS BEING REMOVED AND NOT REINSTALLED. ITEMS NOT DIRECTED OR REQUESTED TO BE TURNED OVER TO THE OWNER SHALL BE DISPOSED OF BY THE ELECTRICAL CONTRACTOR.
  - EQUIPMENT OR MATERIALS WHICH ARE TO BE REUSED OR TURNED OVER TO THE OWNER SHALL BE CAREFULLY REMOVED, CLEANED, AND STORED IN A CLEAN AND DRY AREA. SHOULD THE ELECTRICAL CONTRACTOR ENCOUNTER SUCH EQUIPMENT WHICH IS NOT IN SATISFACTORY CONDITION FOR REUSE AND NOT IN WORKING ORDER, THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY.
  - DISCONNECT ELECTRICAL SERVICES TO ALL EQUIPMENT REQUIRING REMOVAL. CONDUIT SHALL BE REMOVED BACK TO THE POINT WHERE IT WILL BE CONCEALED AT THE COMPLETION OF THIS CONTRACT. WIRE AND CABLE SHALL BE REMOVED BACK TO THE FIRST OUTLET BOX, CABINET, OR TERMINATION POINT WHICH IS TO REMAIN. CIRCUITS WHICH ARE NOT REUSED SHALL BE REMOVED BACK TO THE SOURCE IN THEIR ENTIRETY.
  - REMOVE AND REINSTALL CEILING IN THE EXISTING BUILDING AS REQUIRED FOR THE WORK. COORDINATE WITH THE GENERAL CONTRACTOR. IN SUCH AREAS, REMOVE AND REINSTALL ALL ELECTRICAL DEVICES WHICH ARE TO REMAIN IN OR ON THE CEILING.
  - WHERE NEW CEILINGS CONFLICT WITH EXISTING ELECTRICAL WORK WHICH IS TO REMAIN, RELOCATE THE ELECTRICAL WORK INVOLVED TO CLEAR THE NEW CONSTRUCTION.
  - WHERE NEW WALL OR FLOOR FINISHES CONFLICT WITH EXISTING ELECTRICAL WORK WHICH IS TO REMAIN, RELOCATE THE ELECTRICAL WORK INVOLVED OR PROVIDE BOX EXTENSIONS OR SIMILAR DEVICES AND REINSTALL ON THE NEW FINISH.
  - WHERE EXISTING BRANCH CIRCUITS AND SYSTEMS ARE INTERRUPTED BY NEW WORK OR SYSTEMS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ETC.), EXTEND AND RECONNECT THOSE EXECUTION OF THIS CONTRACT, PROVIDE TEMPORARY CONNECTIONS UNTIL FINAL CONNECTIONS ARE COMPLETE.

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 North Carolina License Number C-0914



05/05/2023

**WESTERN MIDDLE SCHOOL**  
 2100 ELDON DR, ELOI, NC 27244

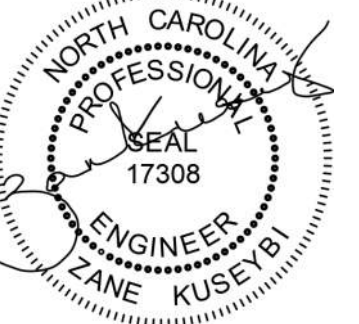
**ELECTRICAL SPECIFICATIONS**

MK	DATE	DESCRIPTION	REVISIONS

DATE	05/05/2023
DRAWN BY	SAS
CHECK BY	ZFK
JOB NO.	22-0419
SHEET	

**E0.2**





05/05/2023

**WESTERN MIDDLE SCHOOL**  
**2100 ELDON DR, ELON, NC 27244**



**1 LEVEL 1 POWER FLOOR PLAN**  
 1/16" = 1'-0"

MK	DATE	DESCRIPTION
		REVISIONS

**LEVEL 1 POWER FLOOR PLAN**

DATE 05/05/2023  
 DRAWN BY SAS  
 CHECK BY ZFK  
 JOB NO. 22-0419  
 SHEET

**E2.1**

**System No. W-L-3065**  
**F Ratings — 1 and 2 Hr (See Item 1)**  
**T Rating — 0 and ¼ Hr (See Item 3)**

1. Wall Assembly — The 1 or 2 fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:  
 A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.  
 B. Gypsum Board — Nom 5/8 in. (16 mm) thick gypsum board, with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (138 mm) when sleeve (Item 2) is employed. Max diam of opening is 4 in. (102 mm) when sleeve (Item 2) is not employed.  
 C. The F Rating of the firestop system is equal to the fire rating of the wall assembly.  
 2. Metallic Sleeve — (Optional) - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or Schedule 5 (or heavier) steel pipe or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between steel sleeve and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm). When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces. As an option when Schedule 5 steel pipe or EMT is used, sleeve may extend continuously beyond one wall surface. When cable bundle penetrates wall assembly at an angle of 45 degrees, no metallic sleeve is used.

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**System No. W-L-3065**  
**F Ratings — 1 and 2 Hr (See Item 1)**  
**T Rating — 0 and ¼ Hr (See Item 3)**

3. Cables — Aggregate cross-sectional area of cable in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (0 mm, point contact) to max 1 in. (25 mm) Cables to be rigidly supported on both sides of the wall assembly. Cable bundle, using cables described below, may penetrate the wall at an angle not greater than 45 degrees. Any combination of the following types and sizes of copper conductor cables may be used:  
 A. Max 7/8 No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.  
 B. Max 25 pair No. 24 AWG telephone cable with PVC insulation and jacket.  
 C. Type RGU coaxial cable with polyethylene (PE) insulation and PVC jacket having a max outside diameter of 1/4 in. (13 mm).  
 D. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.  
 E. Multiple fiber optical communication cable jacketed with PVC and having a max OD of 5/8 in. (16 mm).  
 F. Through Penetrating Products\* — Max three copper conductor No. 8 AWG Metal-Clad Cable+.  
 G. Max 3/4 in. (19 mm) diam copper ground cable with or without a PVC jacket.  
 H. Fire Resistive Cables\* - Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other types of cable.  
 I. Max 4C with ground 300 kcmil (or smaller) aluminum SER cable with PVC insulation and jacket.  
 J. Through Penetrating Product\* — Any cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.  
 K. Maximum 3/8 No. 8 AWG metal-clad cable.  
 L. Maximum 5/8 diam fiber-optic cable with PVC jacket.  
 For cable bundle penetrating the wall assembly at an angle of 45 degrees, the T rating is ¼ hr for a 2 hr wall assembly.  
 See Through Penetrating Product (OALY) category in the Fire Resistance Directory for names of manufacturers.  
 4. Fill, Void or Cavity Material\* — Sealant or Putty — Fill material applied within the annulus, flush with each end of the steel sleeve or wall surface. Fill material installed symmetrically on both sides of the wall. A min 5/8 in. (16 mm) thickness of sealant is required for the 1 or 2 hr F Rating. An additional 1/2 in. (13 mm) diam bead of fill material shall be applied around the perimeter of sleeve on both sides of the wall when sleeve extends beyond surface of wall.  
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-One Sealants or CP618 Putty  
 \*Bearing the UL Classification Mark

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 SYSTEM NO. W-L-3065  
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**System No. W-L-8004**  
**F Rating — 2 Hr**  
**T Rating — 1/4 Hr**

1. Wall Assembly — The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:  
 A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. OC. (610 mm) Additional framing (not shown) may be installed around the perimeter of the opening in lieu of the steel wire mesh (Item No. 3A).  
 B. Gypsum Board\* — Two layers of nom 5/8 in. (16 mm) thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max area of opening is 96 sq in. (692 cm<sup>2</sup>) with max dimension of 12 in. (305 mm) Max width of opening in wood stud walls is limited to 12 in. (305 mm)  
 2. Through Penetrants — The following types and sizes of pipes, conduits, tubing or cables may be used:  
 A. Nom 3 in. (76 mm) diam (or smaller) electrical metallic tubing (EMT).  
 B. Max 25 pair — No. 24 AWG (or smaller) telephone cable with polyvinyl chloride (PVC) insulation and jacket.  
 C. Max 3/8 with ground — No. 10 AWG (or smaller) Type NM cable with PVC insulation and jacket.  
 D. Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC pipe for use in closed (process or supply) piping systems only.  
 E. Max 300 kcmil (or smaller) power cable with PVC insulation and nylon jacket.  
 The through penetrating items to be rigidly supported on both sides of wall assembly and located as shown in the table below:

Item No.	Max Distance Between Adjacent Pen. Item in. (mm)	Min Distance Between Adjacent Pen. Item in. (mm)	Max Distance From Through Opening in. (mm)	Min Distance From Through Opening in. (mm)
2A	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1/2 (13 mm)
2B	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1/2 (13 mm)
2C	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1/2 (13 mm)
2D	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1/2 (13 mm)
2E	7-7/16 (189)	1-11/16 (43)	14-1/2(370)	1-1/2 (32 mm)

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**System No. W-L-8004**  
**F Rating — 2 Hr**  
**T Rating — 1/4 Hr**

3. Firestop System — The firestop system shall consist of the following:  
 A. Steel Wire Mesh — No. 8 steel wire mesh having a min 1 in. (25 mm) lap along the longitudinal seam. Length of steel wire mesh to be 4-3/4 in. (120 mm) centered and formed to fit periphery of through opening. Steel wire mesh is not required when additional framing members (Item No. 1A) are used.  
 B. Packing Material — Min 4.0 in. (102 mm) thickness of min 3.5 pcf (56 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material.  
 C. Fill, Void or Cavity Material\* — Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall.  
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant  
 \*Bearing the UL Classification Mark

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**System No. W-L-8013**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — 5 CFM/sq ft	FH Ratings — 1 and 2 Hr (See Item 1)
L Rating At 400 F — 2 CFM/sq ft	FTM Rating — 0 Hr
	L Rating At Ambient — 5 CFM/sq ft
	L Rating At 400 F — 2 CFM/sq ft

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:  
 A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. (51 mm) by 4 in. (102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. Additional studs installed to completely frame the opening.  
 B. Gypsum Board\* — 5/8 in. (16 mm) thick, 4 ft (1219 mm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max area of opening is 352 sq in. (2271 sq cm) with max dimension of 22 in. (559 mm) wide.  
 C. The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.  
 2. Cable Tray — Max 18 in. (457 mm) wide by max 6 in. (152 mm) deep open-ladder or solid-back cable tray with channel-shaped side rails formed of 0.065 in. (1.65 mm) thick aluminum or 0.060 in. (1.52 mm) thick steel and with 1-1/2 in. (38 mm) channel shape rungs spaced 9 in. (229 mm) OC or a 0.029 in. (0.74 mm) thick steel solid back, respectively. One cable tray to be installed in the opening. The max annular space between the cable tray and the periphery of the opening shall be min 1 in. (25 mm) to max 7 in. (178 mm) Cable tray to be rigidly supported on both sides of floor or wall assembly.

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**System No. W-L-8013**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — 5 CFM/sq ft	FH Ratings — 1 and 2 Hr (See Item 1)
L Rating At 400 F — 2 CFM/sq ft	FTM Rating — 0 Hr
	L Rating At Ambient — 5 CFM/sq ft
	L Rating At 400 F — 2 CFM/sq ft

3. Cables — Aggregate cross-sectional area of cables in cable tray to be max 30 percent of the cross-sectional area of the cable tray. Any combination of the following types and sizes of copper conductor cables may be used:  
 A. 7/8 No. 12 AWG with polyvinyl chloride (PVC) insulation and PVC jacket.  
 B. 100 pair - No. 24 AWG cable with PVC insulation and jacket.  
 C. 1/8, 750 kcmil (or smaller) with PVC insulation and jacket.  
 4. Through-Penetrants — One or more pipe or tube to be installed within the opening. The total number of through-penetrants is dependent on the size of the opening and types and sizes of the penetrants. Any combination of the penetrants described below may be used provided that the following parameters relative to the annular spaces and the spacings between the pipes are maintained. The space between the pipe or tube and the periphery of the opening shall be min 1-1/2 in. (38 mm) to max 9-1/4 in. (235 mm). Pipe or tube to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of non-metallic or metallic pipes, or tubes may be used:  
 A. Polyvinyl Chloride (PVC) Pipe — Max 3 in. (76 mm) diam Schedule 40 solid core PVC pipe (or smaller) for use in closed (process or supply) or vented (drain, waste or vent) piping system.  
 B. Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.  
 C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) diam steel conduit.  
 D. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.  
 E. Copper Tube — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tube.  
 4A. Pipe Covering — (Not Shown) Nom 1-1/2 in. (38 mm) thick hollow cylindrical heavy density (min 3.5 pcf) (56kg/m<sup>3</sup>) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.  
 See Pipe and Equipment Covering and Materials (BROU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 may be used.  
 5. Cables — Max 1-1/2 in. (38 mm) diam tight bundle of cables installed within the opening and rigidly supported on both surfaces of wall. The space between the cables and periphery of the opening shall range from 1-3/16 in. (30.2 mm) min to a max of 1-1/2 in. (38 mm). Any combination of the following types and sizes of cables may be used:  
 A. 7/8 No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.  
 B. 25 pair — No. 24 AWG cable with PVC insulation and jacket.  
 C. Type R GU159 coaxial cable with PVC outer jacket.  
 D. 24 fiber optic cable with PVC sub unit and outer jacket.  
 6. Firestop System — The firestop system shall consist of the following:  
 A. Fill, Void or Cavity Material\* — Fire Blocks For walls incorporating max 3-5/8 in. (92 mm) steel studs or max 2 (51 mm) by 4 in. (102 mm) wood studs, fire block installed with 5 in. (127 mm) dimension projecting through and centered in opening. For walls constructed of larger steel or wood studs, fire block installed with long dimension passing through and centered in opening. Blocks may or may not be cut flush with both surfaces of wall. When multiple layers of gypsum board are used, blocks may be recessed 1/2 in. (13 mm) from surface of wall. Blocks to be firmly packed in opening. Either one or a combination of the block types specified below may be used.  
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS 657 Fire Block or CFS-SL Firestop Block  
 B. Fill, Void or Cavity Material\* — Sealant or Putty — Fill material to be forced into interstices of cables, between cables and cable trays, around each penetrant and where obvious voids are observed to max extent possible on both surfaces of the penetration.  
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant, CP 618 Putty Stick or CP620 Fire Foam  
 \*Bearing the UL Classification Mark

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 SYSTEM NO. W-L-8013  
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**NORTH CAROLINA PROFESSIONAL SEAL 17308**  
 ENGINEER  
 ZANE KUSEYB

05/05/2023

**WESTERN MIDDLE SCHOOL**  
**2100 ELDON DR, ELON, NC 27244**

MK	DATE	DESCRIPTION
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**ELECTRICAL DETAILS**

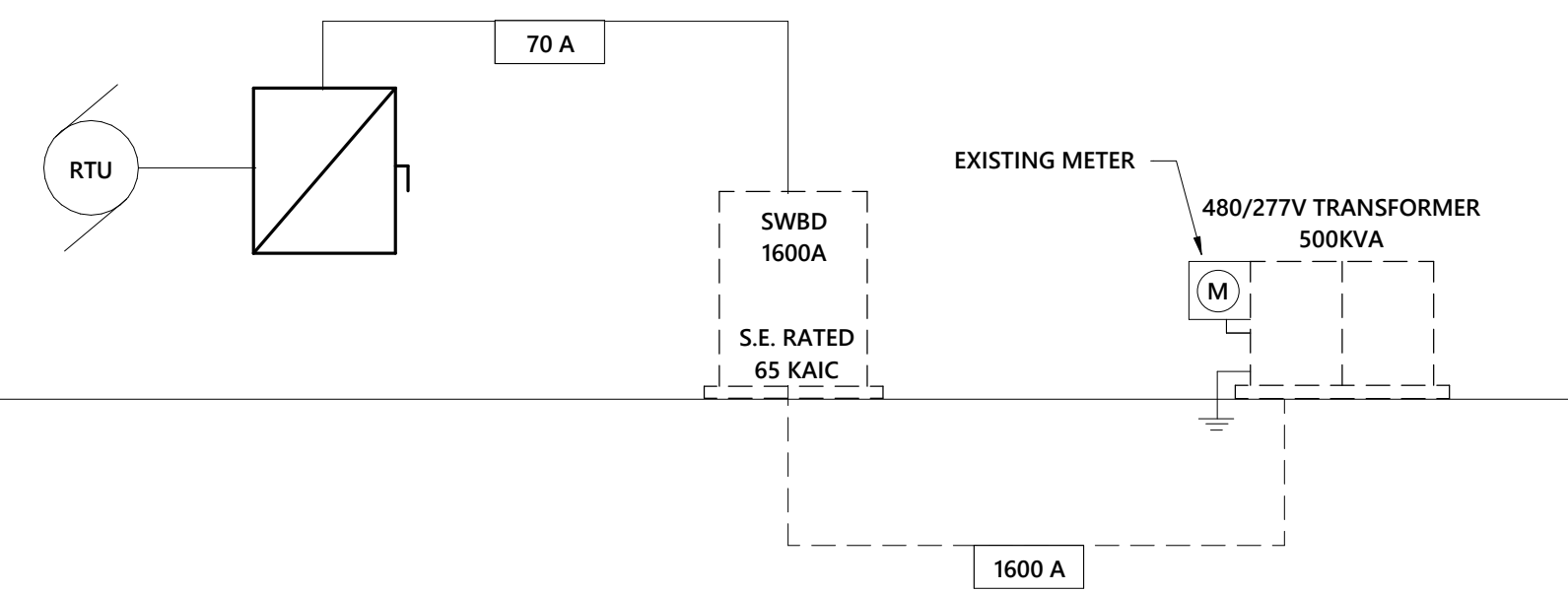
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**E6.1**

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**FEEDER SCHEDULE FOR...**

FEEDER AMPS	WIRE SIZE TEMP 75°C (CU)
70 A	3#4, 1#8G, 1-1/4" C
100 A	4#3, 1#8G, 1-1/4" C
1600 A	(5) 4-400 KCMIL, 1#4/DG, 3-1/2" C



**1 POWER RISER DIAGRAM**  
1/8" = 1'-0"

**SWITCHBOARD: SWBD**

VOLTAGE: 480Y/277 3Ø  
 MOUNTING: FLOOR  
 MAIN: 800 A

MAIN TYPE: MCB (2)  
 PHASE: 3  
 WIRE: 4

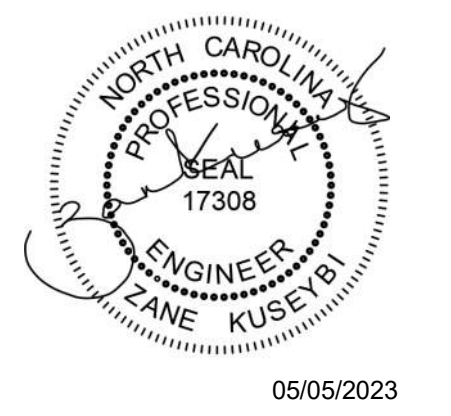
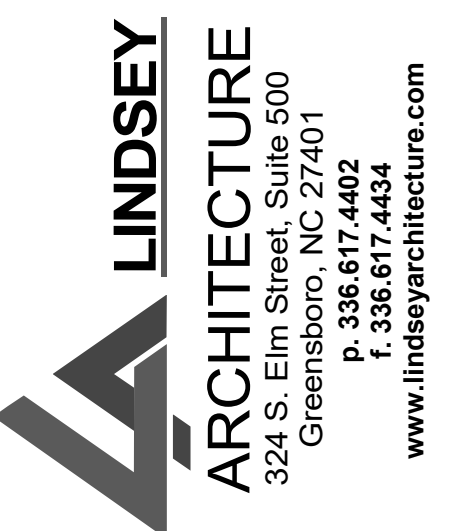
MANUFACTUR... EXTG  
 TYPE: EXTG  
 AIC: 65 KAIC

**MAIN CB NOTES:**

CKT/ID	LOAD SERVED	FRAME	TRIP	POLE	FEEDER	NOTES	Load
1	CHILLER	800 A	700 A	3			200.0 kVA
2	DISCONNECT K1 & K2 XFMR	100 A	100 A	3			50.0 kVA
3	<b>NEW RTU</b>	<b>100 A</b>	<b>70 A</b>	<b>3</b>	<b>SEE RISER</b>		46.5 kVA
4	PANEL PD	200 A	200 A	3			50.0 kVA
5	SPACE ONLY	--	--	3			--
6	SPACE ONLY	--	--	3			--
7	SPACE ONLY	--	--	3			--
8	PANEL PB	200 A	200 A	3			50.0 kVA
9	PANEL PG	200 A	200 A	3			50.0 kVA
10	PANEL PA	200 A	200 A	3			50.0 kVA
11	PANEL PC	200 A	200 A	3			50.0 kVA
12	PANEL PE	200 A	200 A	3			50.0 kVA
13	PANEL PH	200 A	200 A	3			50.0 kVA
14	150KVA TRANSFORMER	200 A	200 A	3			50.0 kVA
15	PANEL PF	200 A	200 A	3			50.0 kVA
16	PANEL SDP	400 A	400 A	3			150.0 kVA

Load Classification	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BOLD INDICATES NEW WORK.
LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA	
HEATING	0.00 kVA	0.00%	0.00 kVA	
COOLING	246.50 kVA	100.00%	246.50 kVA	
VENTILATION	0.00 kVA	0.00%	0.00 kVA	
MOTORS	0.00 kVA	0.00%	0.00 kVA	
KITCHEN	0.00 kVA	0.00%	0.00 kVA	
RECEPTACLES	0.00 kVA	0.00%	0.00 kVA	
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	650.00 kVA	100.00%	650.00 kVA	
ELEVATOR	0.00 kVA	0.00%	0.00 kVA	
EV CHARGING	0.00 kVA	0.00%	0.00 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	896.5 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	896.5 kVA	1078.8 A	1078.8 A	1078.8 A
TOTAL AMP. (CONNECTED):	1078.3 A			
TOTAL AMP. (DEMAND):	1078.3 A			



**WESTERN MIDDLE SCHOOL**  
 2100 ELDON DR, ELON, NC 27244

MK	DATE	DESCRIPTION
		REVISIONS

**ELECTRICAL DIAGRAMS**

DATE: 05/05/2023  
 DRAWN BY: SAS  
 CHECK BY: ZFK  
 JOB NO.: 22-0419  
 SHEET:

**E7.1**

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