VICINITY MAP

CONTACTS

OWNER:	MEP:
JOHNSTON COUNTY PUBLIC SCHOOLS WEST CAMPUS 601A WEST MARKET STREET SMITHFIELD, NC 27577 CONTACT: JOSHUA WOODARD P: 919.795.5090 E-MAIL: joshuawoodard@johnston.k12.nc.us	DEWBERRY ENGINEERS, INC. 2610 WYCLIFF ROAD SUITE 410 RALEIGH, NC 27607 CONTACT: WESTON HOCKADAY, PE P: 919.524.3668 E-MAIL: whockaday@dewberry.com

JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS

CLAYTON MIDDLE SCHOOL AHU 16 & 17 REPLACEMENT

490 GUY RD, CLAYTON, NC 27520

PROJECT SCOPE

PROVIDE HVAC EQUIPMENT INSTALLATION AND ANCILLARY WORK AT JOHNSTON COUNTY PUBLIC SCHOOLS (JCPS) CLAYTON MIDDLE SCHOOL.

DEMOLISH AIR HANDLING UNIT 16 (AHU 16) AND AIR HANDLING UNIT 17 (AHU 17).

DEMOLISH EXHAUST FAN 8 (EF-8) AND RELIEF EXHAUST FAN 9 FOR AHU 17 (EF-9). DEMOLISH EXHAUST FAN 17 HEAT RECOVERY COIL AND HEAT RECOVERY PUMP.

DEMOLISH DUCTWORK TO POINT OF CONNECTION AT MECHANICAL ROOM WALL FOR ALL SYSTEMS. EXISTING DUCT SMOKE DETECTORS TO BE REMOVED AND REINSTALLED IN NEW DUCTWORK.

DEMOLISH PIPING TO POINT OF CONNECTION AT MECHANICAL ROOM WALL FOR CHILLED WATER AND HEATING HOT WATER SYSTEMS.

INSTALL OWNER FURNISHED AIR HANDLING UNITS 16 AND 17. UNITS PRE-PURCHASED BY JCPS FOR LEAD TIME PURPOSES. CONTRACTOR MUST PROVIDE TRANSPORT OF UNITS FROM STORAGE LOCATION TO SITE AT TIME OF CONSTRUCTION.

PROVIDE NEW EXHAUST FAN 16 AND RELIEF EXHAUST FAN 17 WITH CURB ADAPTERS ON ROOF.

PROVIDE NEW DUCTWORK FOR CONNECTION TO EXISTING DUCTWORK POINT OF CONNECTION TO NEW AHU 16, AHU 17, EF-8, AND EF-9. PROVIDE MOTORIZED CONTROL DAMPERS FOR AHU 17 OUTSIDE AND RETURN AIR.

PROVIDE NEW PIPING WITH INSULATION WITH COLOR PVC JACKETING FOR CONNECTION TO EXISTING PIPING POINT OF CONNECTION TO NEW AHU 16 AND AHU 17. PROVIDE ISOLATION VALVES AT MECHANICAL ROOM WALL AT START TO REDUCE BUILDING OUTAGE WHILE INSTALLATION IS ONGOING. PROVIDE NEW PIPING AND ACCESSORIES TO MEET COIL PIPING DETAILS. EXISTING CHILLED WATER COIL CONTROL VALVES MAY BE REUSED. EXISTING HEATING COIL CONTROL VALVES MAY BE REUSED FOR REHEAT COILS.

PROVIDE NEW PREHEAT COIL PUMP FOR AHU 17.

EXISTING CONTROLLERS, CONTROL PANELS, DAMPER ACTUATORS, COOLING COIL CONTROL VALVES, HEATING CONTROL VALVES, AND SENSORS MAY BE REUSED. NEW CONTROL VALVES FOR PREHEAT COILS MUST BE PROVIDED. EXPAND AND REPROGRAM EXISTING CONTROLLERS TO NEW SEQUENCE OF OPERATION. ADD INSTRUMENTATION, SENSORS, ACTUATORS, AND CONTROL POINTS SHOWN ON SCHEMATICS THAT ARE NOT EXISTING SUCH AS FAN SPEED. INTEGRATE NEW BACNET SUPPLY FAN AND EF-8 VFD CONTROLS INTO CONTROL SYSTEM. CONTROLS CONTRACTOR TO REMOVE SENSORS AND ACTUATORS FOR REUSE PRIOR TO MECHANICAL DEMOLITION TO PROTECT FROM DAMAGE.

PROVIDE NEW ELECTRICAL TO SERVE NEW EQUIPMENT FAN STARTERS, PUMP STARTERS, AND AHU FAN SINGLE POINT POWER FAN CONTROL PANEL. PROVIDE ELECTRICAL TO SERVE DEDICATED AHU UV AND LIGHTING CIRCUIT. PROVIDE NEW MECHANICAL ROOM LIGHTING. RELOCATE (2) 1" CONDUITS BELOW AHU 17 LOUVER TO AVOID OBSTRUCTION WITH NEW AHU DIMENSIONS.

PROVIDE PRE-DEMOLITION TESTING VIA DUCT TRAVERSE FOR EXISTING AHU 16, AHU 17, EF-9, AIRFLOW AND STATIC PRESSURE AT SUPPLY, RETURN, AND EXHAUST DUCT CONNECTIONS.

PROVIDE TEST, ADJUSTING, AND BALANCING FOR NEW AIRSIDE AND HYDRONIC EQUIPMENT TO MEET PERFORMANCE, CONTROL SENSOR CALIBRATION, AND CONTROL SETPOINTS SUCH AS OUTSIDE AIR VENTILATION SETPOINTS.

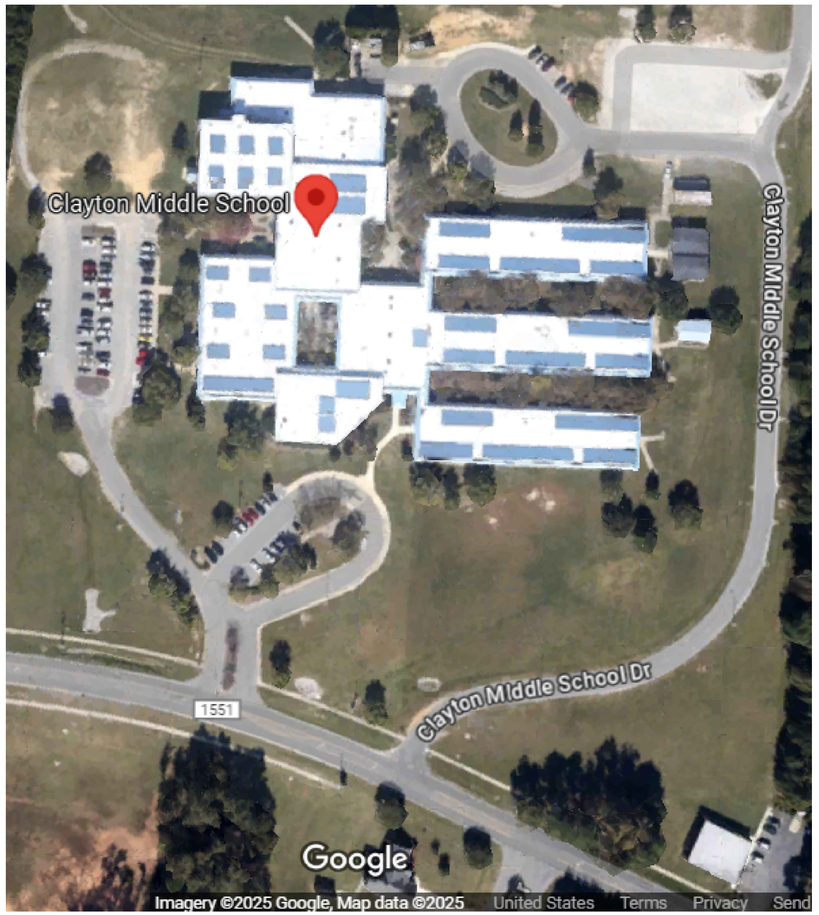
PROVIDE FLUSHING FOR NEW PIPING INSTALLED IN MECHANICAL ROOM. PROVIDE WATER TREATMENT FOR CHILLED WATER AND HEATING HOT WATER SYSTEM AFTER INSTALLATION.

CONTRACTOR TO PLAN WORK WITH PREFABRICATION AND CONSTRUCTION SHIFT SCHEDULE TO DEMOLISH AND INSTALL AIR HANDLING UNITS TO LIMIT OUTAGE DURATION TO LESS THAN OR EQUAL TO 1 WEEK.

CONTRACTOR TO COORDINATE WITH OWNER ON EQUIPMENT DELIVERY TO SCHEDULE DEMOLITION AND NEW WORK FOR AIR HANDLING UNIT OPERATION BY AUGUST 22ND, 2025. CONTRACTOR TO ASSUME EQUIPMENT DELIVERY PRIOR BY AUGUST 1ST, 2025.

DRAWING INDEX

CAMPUS MAP



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JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS

CLAYTON MIDDLE SCHOOL

AHU 16 AND 17 REPLACEMENT

490 GUY RD, CLAYTON, NC 27520

CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042056 WESTON L. HOCKADAY

3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SE

APPROVED BY WH

CHECKED BY JT

DATE 3/31/2025

TITLE

COVER SHEET

PROJECT NO. 50185618

G-001

SHEET NO.

2018 APPENDIX B
BUILDING CODE SUMMARY
FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: JCPS CLAYTON MIDDLE SCHOOL AHU 16 & 17 REPLACEMENT
Address: 490 GUY RD, CLAYTON, NC Zip Code 27520
Owner/Authorized Agent: JOSHUA WOODARD Phone # (919) 934 - 2021 E-Mail joshuawwoodard@johnston.k12.nc.us
Owned By: ☒ City/County ☐ Private ☐ State
Code Enforcement Jurisdiction: ☐ City_____ ☒ County JOHNSTON ☐ State

CONTACT: Mitchell

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural				(____)_____	
Civil				(____)_____	
Electrical	DEWBERRY	WILLIAM A. KEMP	SEAL #041410	(919)424-3724	wkemp@dewberry.com
Fire Alarm				(____)_____	
Plumbing				(____)_____	
Mechanical	DEWBERRY	WESTON HOCKADAY	SEAL #042056	(919) 524-3668	whockaday@dewberry.com
Sprinkler-Standpipe				(____)_____	
Structural				(____)_____	
Retaining Walls >5' High				(____)_____	
Other				(____)_____	

("Others" should include firms and individuals such as trusts, precast, pre-engineered, interior designers, etc.)

2018 NC CODE FOR: ☐ New Construction ☐ Addition ☐ Renovation
☐ 1st Time Interior Completion
☐ Shell/Core
☐ Phased Construction – Shell/Core
☐ Renovation

2018 NC EXISTING BUILDING CODE: ☐ Prescriptive ☐ Repair ☐ Chapter 14
Alteration: ☐ Level I ☒ Level II ☐ Level III
☐ Historic Property ☐ Change of Use
CONSTRUCTED:(date) _____ **ORIGINAL OCCUPANCY(S)** (Ch. 3):_____
RENOVATED: (date) _____ **CURRENT OCCUPANCY(S)** (Ch. 3):_____
RISK CATEGORY (table 1604.5) **Current:** ☐ I ☐ II ☐ III ☐ IV
Proposed: ☐ I ☐ II ☐ III ☐ IV

BASIC BUILDING DATA:
Construction Type: ☐ I ☐ II-A ☐ III-A ☐ IV ☐ V-A
(check all that apply) ☐ I-B ☐ II-B ☐ III-B ☐ V-B
Sprinklers: ☒ No ☐ Partial ☐ Yes ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D
Standpipes: ☐ No ☐ Yes Class ☐ I ☐ II ☐ III ☐ Wet ☐ Dry
Fire District: ☒ No ☐ Yes (Primary) **Flood Hazard Area:** ☐ No ☐ Yes
Special Inspections Required: ☐ No ☐ Yes

ACCESSIBLE PARKING
(SECTION 1106)

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 132" ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	
TOTAL						

PLUMBING FIXTURE REQUIREMENTS
(TABLE 2902.1)

USE		WATERCLOSETS			URINALS	LAVATORIES			SHOWERS / TUBS	DRINKING FOUNTAINS	
		MALE	FEMALE	UNISEX		MALE	FEMALE	UNISEX		REGULAR	ACCESSIBLE
SPACE	EXIST'G										
	NEW										
	RENO'D										

SPECIAL APPROVALS

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

Gross Building Area:

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	RENO/ALTER (SQ.FT)	SUB-TOTAL
Ground Floor	5,932			5,932
First Floor	5,932			5,932
				0
				0
				0
				0
				0
				0
				0
				0
				0
				0
TOTAL	11,864	0	0	5,932

ALLOWABLE AREA

Primary Occupancy Classification: SELECT ONE
Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☐
Educational ☒
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 Condition ☐ 1 ☐ 2
☐ I-2 Condition ☐ 1 ☐ 2
☐ I-3 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 ☐ Hi-piled
☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage
Utility and Miscellaneous ☐

Accessory Occupancy Classification(s): _____
Incidental Uses (Table 509): _____
Special Uses (Chapter 4 – List Code Sections): _____
Special Provisions: (Chapter 5 – List Code Sections): _____
Mixed Occupancy: ☒ No ☐ Yes Separation: ____ Hr. Exception: _____
☐ Non-Separated Use (508.3)
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.
☐ 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.

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

$$\frac{\quad}{\quad} + \frac{\quad}{\quad} + \ldots = \frac{\quad}{\quad} \leq 1.00$$

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the **North Carolina Energy Conservation 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: ☐ No ☐ Yes (The remainder of this section is not applicable)

Exempt Building: ☐ No ☐ Yes (Provide Code or Statutory reference): _____

Climate Zone: ☐ 3A ☐ 4A ☐ 5A

Method of Compliance: Energy Code ☐ Performance ☐ Prescriptive
ASHRAE 90.1 ☐ Performance ☐ Prescriptive
(If "Other" specify source here) _____

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: _____

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA	(C) AREA FOR FRONTAGE INCREASE[1,2]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED[2,3]

[1] Frontage area increases from Section 506.3 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = _____ (F)
b. Total Building Perimeter = _____ (P)
c. Ratio (F/P) = _____ (F/P)
d. W = Minimum width of public way = _____ (W)
e. Percent of frontage increase I_f = 100 [F/P - 0.25] x W/30 = _____ (%)
[2] Unlimited area applicable under conditions of Section 507 or Section 508.
[3] Maximum Building Area = total number of stories in building x area for one story (maximum 3 stories) (506.2).
[4] The maximum area of open parking garages must comply with Table 406.5.4
[5] Frontage increase is based on the unsprinklered value in Table 506.2.

ALLOWABLE HEIGHT

	ALLOWABLE (Table t 503)	SHOWN ON PLANS	CODE REFERENCE
Building Height in Feet (Table 504.3)			
Building Height in Stories (Table 504.4)			

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

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
STRUCTURAL DESIGN
(PROVIDE ON THE STRUCTURAL SHEETS IF APPLICABLE)

DESIGN LOADS:

Importance Factors: Snow (I_S) _____
Seismic (I_E) _____

Live Loads: Roof _____ psf
Mezzanine _____ psf
Floor _____ psf

Ground Snow Load: _____ psf

Wind Load: Ultimate Wind Speed _____ mph (ASCE-7)
Exposure Category _____

SEISMIC DESIGN CATEGORY ☐ A ☐ B ☐ C ☐ D
Provide the following Seismic Design Parameters:
Occupancy Category (Table 1604.5) ☐ I ☐ II ☐ III ☐ IV
Spectral Response Acceleration S_S _____ %g S_1 _____ %g
Site Classification (ASCE 7) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F
Data Source: ☐ Field Test ☐ Presumptive ☐ Historical Data
Basic structural system ☐ Bearing Wall ☐ Dual w/Special Moment Frame
☐ Building Frame ☐ Dual w/Intermediate R/C or Special Steel
☐ Moment Frame ☐ Inverted Pendulum
Analysis Procedure: ☐ Simplified ☐ Equivalent Lateral Force ☐ Dynamic
Architectural, Mechanical, Components anchored? ☐ Yes ☐ No

LATERAL DESIGN CONTROL: Earthquake ☐ Wind ☐

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) _____ psf
Presumptive Bearing capacity _____ psf
Pile size, type, and capacity _____

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (w/ _____ * REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
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							

* Indicate section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS

FIRE SEPARATION DISTANCE (FEET FROM PERPERTY LINES	DEGREES OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL SHOWN ON PLANS (%)

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
MECHANICAL DESIGN
(PROVIDE ON THE MECHANICL SHEETS IF APPLICABLE)

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone 3A
winter dry bulb: 16°
summer dry bulb: 92°

Interior design conditions
winter dry bulb: 72°
summer dry bulb: 75°
relative humidity: 60%

Building heating load: N/A

Building cooling load: N/A

Mechanical Spacing Conditioning System
Unitary
description of unit: N/A
heating efficiency: N/A
cooling efficiency: N/A
size category of unit: N/A
Boiler
Size category. If oversized, state reason.: N/A
Chiller
Size category. If oversized, state reason.: N/A

List equipment efficiencies: SEE EQUIPMENT SCHEDULES

LIFE SAFETY SYSTEM REQUIREMENTS

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

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 (Table 705.8)
☐ Occupancy types for each area as it relates to occupant load calculations (Table 1004.1.2)
☐ Occupant loads for each area
☐ Exit access travel distances (1017)
☐ Common path of travel distances (1006.2.1 & 2006.3)
☐ Dead end lengths (1020.4)
☐ Clear exit widths for each exit door
☐ Maximum calculated occupant load each exit door can accommodate based on egress width (1005.3)
☐ Actual occupant load for each exit door
☐ A separate schematic floor plan identifying where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation and/or occupancy construction for a fire barrier/fire partition/smoke barrier.
☐ 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 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

Section/Table/Note	Title

ACCESSIBLE DWELLING UNITS
(SECTION 1107)

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

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
ELECTRICAL DESIGN
(PROVIDE ON THE ELECTRICAL SHEETS IF APPLICABLE)

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance: Energy Code: ☐ Prescriptive ☐ Performance
ASHRAE 90.1: ☐ Prescriptive ☐ Performance

Lighting schedule (each fixture type)
lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballasts in fixture
total wattage per fixture
total interior watts vs. allowed (whole building or space by space)
total exterior watts vs. specified vs. allowed

Additional Efficiency Package Options
(When using the 2018 NCECC; not required for ASHRAE 90.1)
☐ C406.2 More Efficient Mechanical Equipment
☐ C406.3 Reduced Lighting Power Density
☐ C406.4 Enhanced Digital Lighting Controls
☐ C406.5 On-Site Renewable Energy
☐ C406.6 Dedicated Outdoor Air System
☐ C406.7 Reduced Energy Use in Service Water Heating

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CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 042056 WESTON L. HOCKADAY
3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

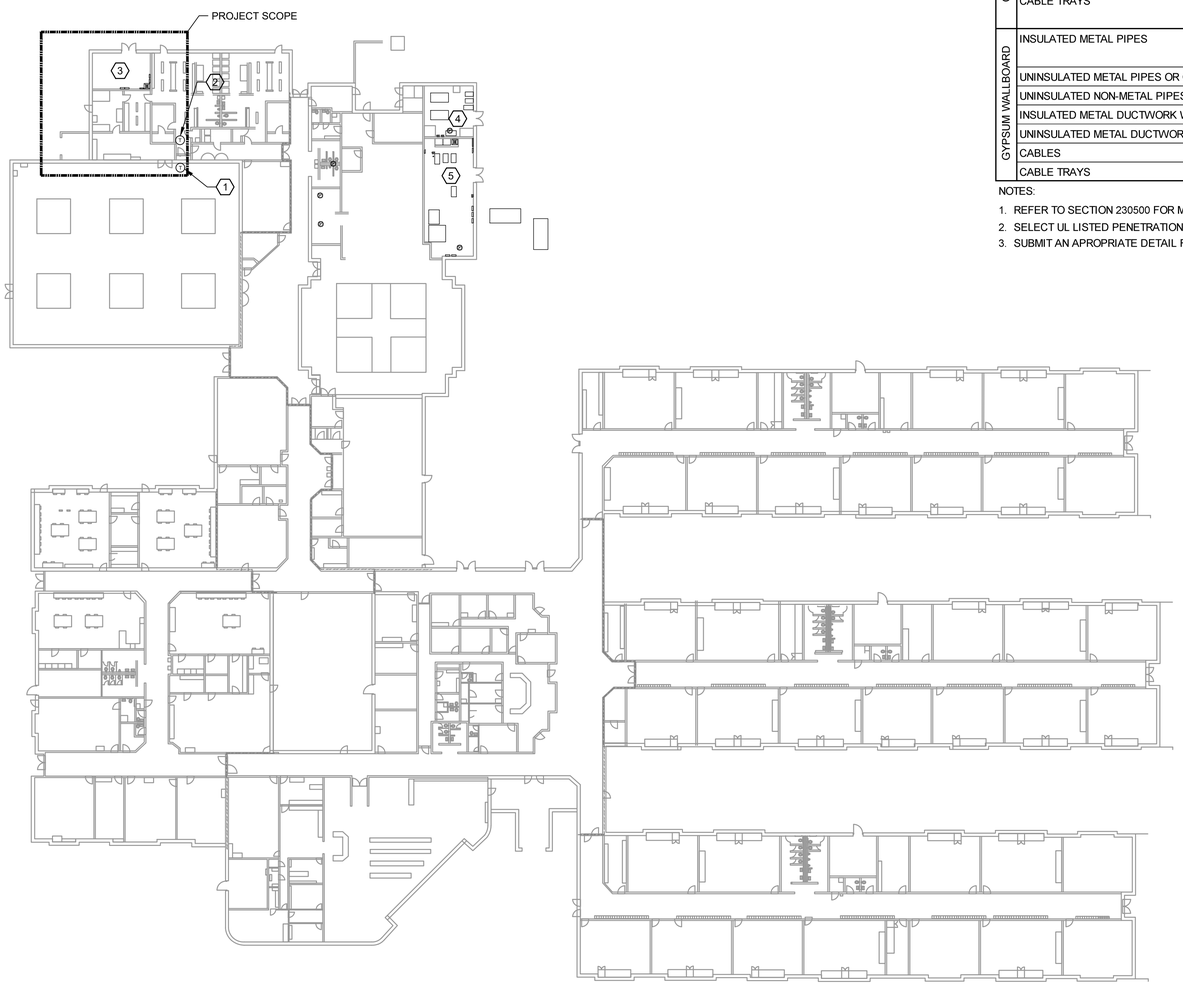
DRAWN BY SF
APPROVED BY WH
CHECKED BY JT
DATE 3/31/2025

TITLE
BUILDING CODE SUMMARY

PROJECT NO. 50185618

G-002

SHEET NO.



1 FIRST FLOOR LOCATOR PLAN
SCALE: 1/32" = 1'-0"
0' 16' 32' 64'

LIFE-SAFETY PENETRATION SCHEDULE

	ASSEMBLY AND PENETRATION TYPE	F RATING (HR)	U. L. DETAIL SYSTEM NUMBER
CONCRETE FLOORS	INSULATED METAL PIPES	1 or 2	CAJ-5061, CAJ-5090, CAJ-5091, CAJ-5096, CAJ-5277
		3	CAJ-5061, CAJ-5090
	UNINSULATED METAL PIPES OR CONDUITS	1 or 2	CAJ-1226, CAJ-1155, CAJ-1380, CAJ-1575, FA-1028
		4	CBJ-1037
	UNINSULATED NON-METAL PIPES OR CONDUITS	1 or 2	CAJ-2109, CAJ-2407, CAJ-2567, CAJ-2831
	UNINSULATED METAL DUCTWORK WITHOUT DAMPERS	1 or 2	CAJ-7029, CAJ-7084
	CABLES	1 or 2	CAJ-3095, CAJ-3210, CAJ-3239
	CABLE TRAYS	1 or 2	CAJ-4034, CAJ-4035, CAJ-4083
		4	CAJ-4107
CONCRETE / MASONRY WALLS	INSULATED METAL PIPES	1 or 2	CAJ-5061, CAJ-5090, CAJ-5091, CAJ-5096, CAJ-5277
		4	WJ-5028
	UNINSULATED METAL PIPES OR CONDUITS	1 or 2	CAJ-1226, CAJ-1155, CAJ-1380, CAJ-1575
		4	CAJ-1630
	UNINSULATED NON-METAL PIPES OR CONDUITS	1 or 2	CAJ-2109, CAJ-2407, CAJ-2567, CAJ-2831
	INSULATED METAL DUCTWORK WITHOUT DAMPERS	1 or 2	CAJ-7145, WJ-7091, WJ-7112
	UNINSULATED METAL DUCTWORK WITHOUT DAMPERS	1 or 2	CAJ-7029, WJ-7109, WJ-7021
		3	CAJ-7192
	CABLES	1 or 2	CAJ-3095, CAJ-3180, WJ-3036
	CABLE TRAYS	1 or 2	CAJ-4034, CAJ-4035, CAJ-4083
		4	CAJ-4107
GYPSUM WALLBOARD	INSULATED METAL PIPES	1 or 2	WL-5046, WL-5047, WL-5096
		4	WL-5073
	UNINSULATED METAL PIPES OR CONDUITS	1 or 2	WL-1164, WL-1205, WL-1465
	UNINSULATED NON-METAL PIPES OR CONDUITS	1 or 2	WL-2084, WL-2341, WL-2649
	INSULATED METAL DUCTWORK WITHOUT DAMPERS	1 or 2	WL-7151, WL-7156
	UNINSULATED METAL DUCTWORK WITHOUT DAMPERS	1 or 2	WL-7155, WL-7213, WL-7250
	CABLES	1 or 2	WL-3065, WL-3111, WL-3161
	CABLE TRAYS	1 or 2	WL-4011, WL-4019, WL-4081

NOTES:
1. REFER TO SECTION 230500 FOR MORE INFORMATION.
2. SELECT UL LISTED PENETRATION DETAIL MATCHING THE PENETRATION CONDITIONS.
3. SUBMIT AN APROPRIATE DETAIL FOR ENGINEER REVIEW IF THE PROJECT CONDITIONS ARE NOT REPRESENTED ABOVE.

GENERAL NOTES:

1. AREA OF CONSTRUCTION LIMITED TO MECHANICAL ROOM. EXISTING WALL MODULE LOCATIONS MAY BE REUSED FOR CONTROL OF NEW AIR HANDLING UNITS UNLESS CONTROLLERS ARE REPLACED. BOILER AND CHILLED WATER PUMP ROOMS NOTED FOR HYDRONIC SYSTEM DRAIN, FILL, AND WATER TREATMENT LOCATIONS.

(#) KEYNOTES:

1. WALL MODULE LOCATION FOR AHU-16 FOR SPACE SENSORS.
2. WALL MODULE LOCATION FOR AHU-17 FOR SPACE SENSORS.
3. AHU 16 AND 17 MECHANICAL ROOM.
4. BOILER ROOM.
5. CHILLER PUMP ROOM.

Dewberry

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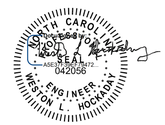
JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS
CLAYTON MIDDLE SCHOOL
AHU 16 AND 17 REPLACEMENT
490 GUY RD,
CLAYTON, NC 27520
CONSTRUCTION DOCUMENTS

SEAL



KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY WH
CHECKED BY JT
DATE 3/31/2025

TITLE
FIRST FLOOR LOCATOR & U.L. DETAILS

PROJECT NO. 50185618

G-003

SHEET NO.

ABBREVIATIONS - MECHANICAL

THIS IS A MASTER ABBREVIATIONS LIST. SOME ABBREVIATIONS MAY NOT APPLY TO THIS PROJECT.

(D)	DEMOLISH
(E)	EXISTING
(R)	REMOVE
AC	AIR CONDITIONING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AF	AIRFLOW
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AS	AIR SEPARATOR
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR-CONDITIONING ENGINEERS
ATC	AUTOMATIC TEMPERATURE CONTROL
ATV	ATMOSPHERIC VENT
BAS	BUILDING AUTOMATION SYSTEM
BHP	BRAKE HORSEPOWER
BI	BINARY INPUT
BMS	BUILDING MANAGEMENT SYSTEM
BO	BINARY OUTPUT
BT	BUFFER TANK
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CO, CM	CARBON MONOXIDE
CO2, CD	CARBON DIOXIDE
CONT	CONTROLS, CONTINUED
CRU	CONDENSATE RETURN UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
Cv	VALVE COEFFICIENT
CWP	CONDENSER WATER PUMP
DB	DRY BULB
DBL	DOUBLE
DEG	DEGREE
DI	DIGITAL INPUT
DIA	DIAMETER
DMSS	DUCTLESS MINI-SPLIT SYSTEM
DN	DOWN
DO	DIGITAL OUTPUT
DOAS	DEDICATED OUTDOOR AIR SYSTEM
DP	DIFFERENTIAL PRESSURE (SENSOR)
DP	DEW POINT
DRE	DRYER EXHAUST
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ECM	ELECTRONICALLY COMMUTATED MOTOR
EF	EXHAUST FAN
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRICAL
EMCS	ENVIRONMENTAL MANAGEMENT CONTROL SYSTEM
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETC	ETCETERA
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WATER HEATER
EWT	ENTERING WATER TEMPERATURE
F	DEGREES FAHRENHEIT
FD	FIRE DAMPER OR FLOOR DRAIN
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FP	FAN POWERED
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FT	FOOT/FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRAINS
GUH	GAS FIRED UNIT HEATER
H	HUMIDIFIER OR HEIGHT

ABBREVIATIONS - MECHANICAL

THIS IS A MASTER ABBREVIATIONS LIST. SOME ABBREVIATIONS MAY NOT APPLY TO THIS PROJECT.

H2O	WATER
HD	HEAD
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AND AIR-CONDITIONING
HWT	HEATING WATER TEMPERATURE
HX	HEAT EXCHANGER
IN	INCH
KW	KILOWATT
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAR FEET
LWT	LEAVING WATER TEMPERATURE
M	MOTOR OR MOTORIZED DAMPER OR METER
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKEUP AIR UNIT
MBH	1,000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFR	MANUFACTURER
MOCP	MAXIMUM OVERCURRENT PROTECTION
NC	NORMALLY CLOSED OR NOISE CRITERIA
NO	NORMALLY OPEN OR NUMBER
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OAT	OUTDOOR AIR TEMPERATURE
OD	OUTSIDE DIAMETER
OS	OCCUPANCY SENSOR
P	PRESSURE OR PRESSURE SENSOR
PD	PRESSURE DROP
PH	PHASE
PHC	PREHEAT COIL
PICV	PRESSURE INDEPENDENT CONTROL VALVE
PPM	PARTS PER MILLION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
QTY	QUANTITY
R	RADIUS, RISE, OR REMOVE
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
REF	RELIEF AIR FAN
RH	RELATIVE HUMIDITY, REHEAT
RF	RETURN AIR FAN
RHC	REHEAT COIL
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAT	SUPPLY AIR TEMPERATURE
SCH	SCHEDULE
SEC	SECONDS
SF	SUPPLY FAN OR SQUARE FOOT
SP	STATIC PRESSURE
SS	SPLIT SYSTEM OR STAINLESS STEEL
T, TEMP	TEMPERATURE
T&P	TEMPERATURE AND PRESSURE
T-STAT	THERMOSTAT
TON	COOLING TONS (12,000 BTUH)
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
V, VOLT	VOLTAGE
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VF	VENTILATION FAN
VFD	VARIABLE FREQUENCY DRIVE
W	WIDTH OR WATTS
W/	WITH
WB	WET BULB
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP

MECHANICAL GENERAL NEW WORK NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS. MECHANICAL EQUIPMENT SHALL BE SELECTED TO MEET OR EXCEED THE REQUIREMENTS OF THE ENERGY CONSERVATION CODE. MECHANICAL WORK SHALL COMPLY WITH PROJECT SPECIFICATIONS.
2. FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES REQUIRED TO MAKE THE MECHANICAL WORK COMPLETE AND OPERATIONAL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING, TESTING AND VERIFYING CONTROL SEQUENCES, LINE BY LINE, AND VERIFYING OPERATION OF THE EQUIPMENT. ALL EQUIPMENT, VALVES, DAMPERS ACTUATORS, ETC. SHALL BE FUNCTIONAL BEFORE PROJECT CLOSEOUT. COORDINATE WITH ELECTRICAL, FIRE ALARM AND TAB CONTRACTORS. REFER TO SECTION 239001 FOR MORE DETAIL.
4. THESE DRAWINGS ARE DIAGRAMMATIC. EXACT EQUIPMENT LOCATIONS AND DUCT AND PIPING ROUTING SHALL BE COORDINATED WITH THE BUILDING AND SITE CONDITIONS. THE ACTUAL EQUIPMENT AND MINIMUM CLEARANCE DIMENSIONS SHALL BE VERIFIED WITH THE SUPPLIERS.
5. EQUIPMENT, DUCTWORK, PIPING AND CONDUIT LAYOUT SHALL BE COORDINATED WITH BUILDING COMPONENTS AND OTHER TRADES PRIOR TO INSTALLATION. THE SYSTEM SHALL BE NEATLY ARRANGED TO MAXIMIZE SPACE ABOVE CEILINGS AND WITHIN CHASES. MAINTAIN MINIMUM EQUIPMENT AND DEVICE MAINTENANCE CLEARANCES. DEVICES SHALL BE READILY MAINTAINABLE. METERS AND GAGES SHALL BE ORIENTED FOR BEST VIEW. INSTALLED MATERIALS NOT COORDINATED SHALL BE REMOVED AND REINSTALLED AT NO ADDITIONAL COST.
6. DUCT OFFSETS SHALL BE MADE AT 15 OR 30-DEGREE ANGLES WHERE POSSIBLE BUT AT NO MORE THAN 45-DEGREES.
7. WALL-MOUNTED CONTROL SENSORS SHALL BE INSTALLED AT 48-INCHES ABOVE THE FLOOR TO THE TOP OF BACK-BOX. COORDINATE EXACT LOCATIONS WITH LIGHT SWITCHES. WHEN BOTH ARE INDICATED ADJACENT TO A DOOR, LOCATE THE SWITCH CLOSEST TO THE DOOR AND THE SENSOR WITHIN 12-INCHES OF THE SWITCH.
8. CONTROL AND ALARM DEVICES SHALL BE INSTALLED IN BACK-BOXES WITHIN EXISTING WALLS. SURFACE-MOUNTED CONDUIT AND RACEWAY WILL NOT BE ACCEPTED EXCEPT FOR EXISTING SOLID CONCRETE WALLS. DEVICE BACK-BOXES IN FIRE-RATED WALLS SHALL HAVE FIRESTOP PUTTY PADS OR EQUIVALENT UL-LISTED INSTALLATION.
9. INSTALL PENETRATIONS OF LIFE-SAFETY RATED ASSEMBLIES PER APPROVED UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE.
10. PROVIDE A DUCT ACCESS DOOR FOR EACH DUCT-MOUNTED DEVICE REQUIRING MAINTENANCE OR INSPECTION. REFER TO SECTION 23 33 00 FOR DOOR SIZING REQUIREMENTS. COORDINATE CEILING AND WALL ACCESS DOORS WITH DUCT ACCESS DOORS.
11. HVAC PIPING SHALL BE NO LESS THAN 3/4-INCH, EXCEPT REFRIGERANT PIPING.
12. ALL MOTORIZED EQUIPMENT SHALL BE CONNECTED TO DUCTWORK OR PIPING WITH FLEXIBLE CONNECTIONS.
13. EXTEND POWER CONDUIT AND WIRING FROM DEDICATED POWER SOURCES TO CONTROL EQUIPMENT AND DEVICES. COORDINATE POWER SOURCES WITH ELECTRICAL CONTRACTOR.
14. PIPING BRANCHES FROM MAINS TO HEATING AND COOLING COILS SHALL MATCH SCHEDULED SIZES UNLESS OTHERWISE NOTED.
15. MAINTAIN MINIMUM 36-INCH CLEARANCE FOR 120/208V POWER OR 42-INCH CLEARANCE FOR 277/480V POWER AS REQUIRED BY THE NATIONAL ELECTRIC CODE FOR ELECTRICAL EQUIPMENT AND TO PROVIDE MAINTENANCE ACCESS.
16. FIELD VERIFY EXACT PIPING SIZES AND FLOW DIRECTIONS PRIOR TO CONNECTING TO PIPING SYSTEM.

MECHANICAL GENERAL DEMOLITION WORK NOTES

1. VERIFY PROJECT SITE EXISTING CONDITIONS PRIOR TO BID. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE APPROXIMATE AND DO NOT INCLUDE EVERY COMPONENT.
2. RECORD EXISTING CONDITIONS PRIOR TO THE START OF WORK. REPAIR DAMAGES RESULTING FROM PROJECT WORK.
3. COORDINATE MATERIALS TO BE RETAINED BY THE OWNER PRIOR TO THE START OF DEMOLITION WORK. RETAINED MATERIALS SHALL BE DELIVERED TO A POINT DESIGNATED BY THE OWNER WITHIN A 10-MILE RADIUS OF THE PROJECT SITE. PROPERLY DISPOSE OF ALL REMAINING DEMOLITION MATERIALS. COMPLY WITH MATERIAL RECYCLING REQUIREMENTS. DO NOT ABANDON IN PLACE ANY ITEMS IDENTIFIED TO BE REMOVED UNLESS OTHERWISE NOTED.
4. THE SCOPE OF DEMOLITION FOR ITEMS TO BE REMOVED INCLUDES ASSOCIATED SUPPORTS, POWER CONNECTIONS, CONTROLS, ETC.
5. PERFORM ALL DEMOLITION INDICATED INCLUDING THAT REQUIRED TO INSTALL NEW WORK. REMOVE AND REINSTALL MATERIALS TO REMAIN AS NEEDED WHERE REQUIRED TO PERFORM DEMOLITION OR TO INSTALL NEW WORK. REPAIR DAMAGED SURFACES TO MATCH EXISTING ADJACENT SURFACES.
6. REMOVE DUCT, PIPING AND CONDUIT BACK TO POINTS INDICATED. PREPARE OPEN ENDS FOR CONNECTION TO NEW WORK INDICATED OR CAP.
7. REPAIR DAMAGE TO ANY OPENINGS IN LIFE-SAFETY RATED ASSEMBLIES CREATED BY THE DEMOLITION WORK PER APPROVED UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE.
8. PIPING AND CONDUIT TO BE REMOVED THAT IS LOCATED BELOW CONCRETE SLAB-ON-GRADE FLOORS OR WITHIN CONCRETE SOLID OR BLOCK WALLS MAY BE ABANDONED IN PLACE UNLESS NECESSARY TO INSTALL NEW WORK OR NOTED OTHERWISE. WHEN ABANDONING CUT PIPING OR CONDUIT BACK AT LEAST 1-INCH BEHIND THE SURFACE, PLUG THE ENDS AND PATCH THE SURFACE WITH SIMILAR MATERIAL.
9. DURING RENOVATION OF OCCUPIED AREAS MAINTAIN OPERATION OF EXISTING CONTROL SYSTEM. AT EACH PHASE RE-VERIFY OPERATION OF REMAINING CONTROLLED DEVICES AFTER REMOVAL WORK IS COMPLETE.
10. EXISTING SYSTEMS SERVING AREAS OCCUPIED DURING CONSTRUCTION SHALL BE KEPT IN OPERATION BY TEMPORARY MEANS. TEMPORARY MEANS INCLUDES TEMPORARY BYPASSES OR CONNECTIONS TO BUILDING SYSTEMS AND / OR CONNECTIONS TO TEMPORARY EQUIPMENT. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.

HAZARDOUS MATERIAL NOTES

1. HAZARDOUS MATERIALS WARNING: IF UNCOVERED MATERIALS ARE SUSPECTED OF CONTAINING ASBESTOS, LEAD-BASED PAINT, PCB'S OR ANY OTHER HAZARDOUS MATERIAL, STOP WORK IN THAT AREA AND REPORT THE CONCERN TO THE CONSTRUCTION MANAGER, OWNER, ARCHITECT AND ENGINEER IMMEDIATELY.

HVAC SYMBOLS

SYMBOL	DESCRIPTION
	GRILLES
	ECCENTRIC TRANSITION
	CONCENTRIC TRANSITION
	RADIUS OFFSET (IN THE VERTICAL)
	MITERED OFFSET (IN THE VERTICAL)
	RADIUS ELBOW
	MITERED ELBOW WITH TURNING VANES
RISE DROP	SUPPLY DUCT
RISE DROP	RETURN AIR DUCT
RISE DROP	EXHAUST AIR DUCT
	FLEX DUCT
	DEMOLITION DUCTWORK OR EQUIPMENT
	EXISTING DUCTWORK OR EQUIPMENT
24x24	NEW DUCTWORK OR EQUIPMENT
24Ø	ROUND DUCT RISE/DROP
24/18Ø	OVAL DUCT RISE/DROP
	RECTANGULAR TAKE-OFF
	ROUND TAKE-OFF
BOTTOM TOP SIDE	ACCESS DOORS

MECHANICAL PIPING SYMBOLS

SYMBOL	DESCRIPTION
ABBV	PIPE WITH SYSTEM ABBREVIATION.
	BALL VALVE
	STOP VALVE (HANDLE OPTIONAL)
	3-WAY VALVE
	BALANCING VALVE AUTOMATIC & MANUAL
	BACKWATER VALVE
	BUTTERFLY VALVE
	CONTROL VALVE
	3-WAY CONTROL VALVE
	PIPE TURN UP
	PIPE TURN DOWN
	PIPE BOTTOM TAKE OFF
	PIPE TOP TAKE OFF
	PIPE CAP OR PLUG
	PIPE UNION
	WYE STRAINER

MECHANICAL PIPING SYSTEMS

SYMBOL	DESCRIPTION
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
D	DRAIN
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY

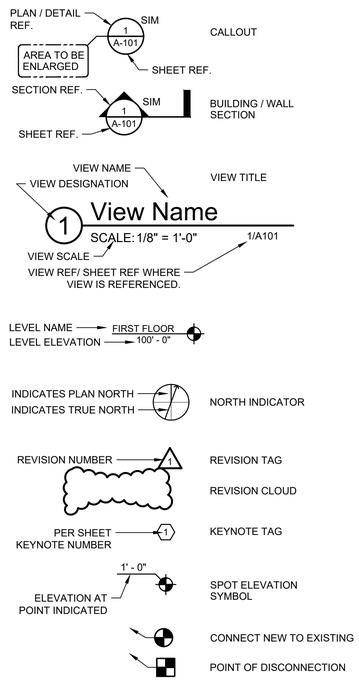
HVAC SYMBOLS CONTINUED

SYMBOL	DESCRIPTION
	DAMPERS
AD	VOLUME DAMPER
	FIRE DAMPER
	FIRE/SMOKE DAMPER
	SMOKE DAMPER
	MANUAL DAMPER
	GRAVITY BACKDRAFT DAMPER
	MOTORIZED PARALLEL BLADE DAMPER
	MOTORIZED OPPOSED BLADE DAMPER
	CONTROLS
T	WALL MODULE
CD	CARBON DIOXIDE SENSOR
	DUCT MOUNTED SMOKE DETECTOR
T H	DUCT MOUNTED TEMPERATURE/HUMIDITY SENSOR
T	TEMPERATURE SENSOR
H	HUMIDITY SENSOR
FZ	FREEZESTAT
T	AVERAGING TEMPERATURE SENSOR IN AIR DUCT
	OCCUPANCY SENSOR
M	MANUAL MOTOR STARTER, FRACTIONAL HORSEPOWER (SEE STARTER SCHEDULE FOR SIZE, ETC.)

ABBREVIATIONS

"AD" = AUTOMATIC/MOTORIZED
"A/F" = AUTOMATIC/FIRE (MOTORIZED)
"MD" = MANUAL VOLUME
"BD" = BACKDRAFT
"FD" = FIRE
"F/S" = FIRE SMOKE
"SD" = SMOKE

STANDARD DETAILING SYMBOLS



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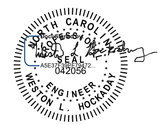

KEY PLAN

SCALE

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NO.	DESCRIPTION	DATE

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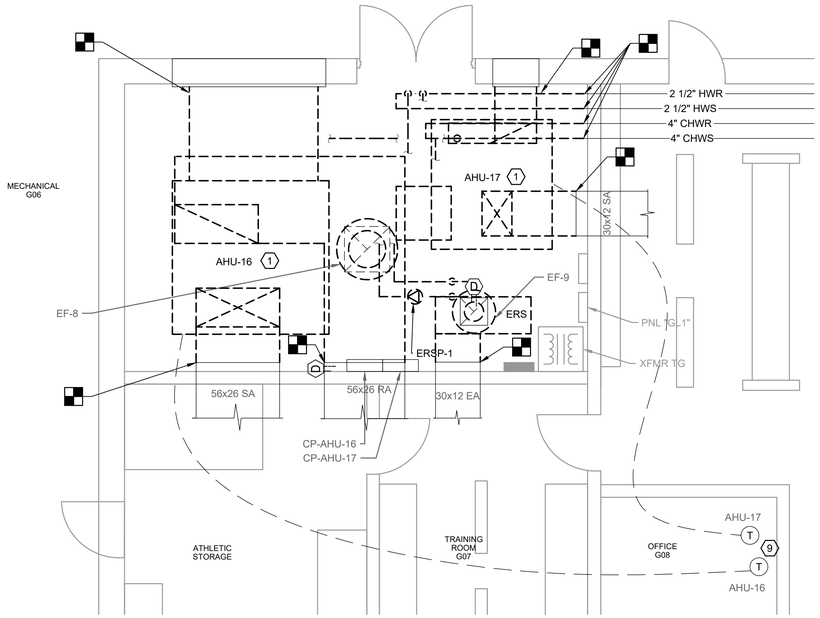
MECHANICAL SYMBOLS, ABBREVIATIONS & NOTES

PROJECT NO. 50185618

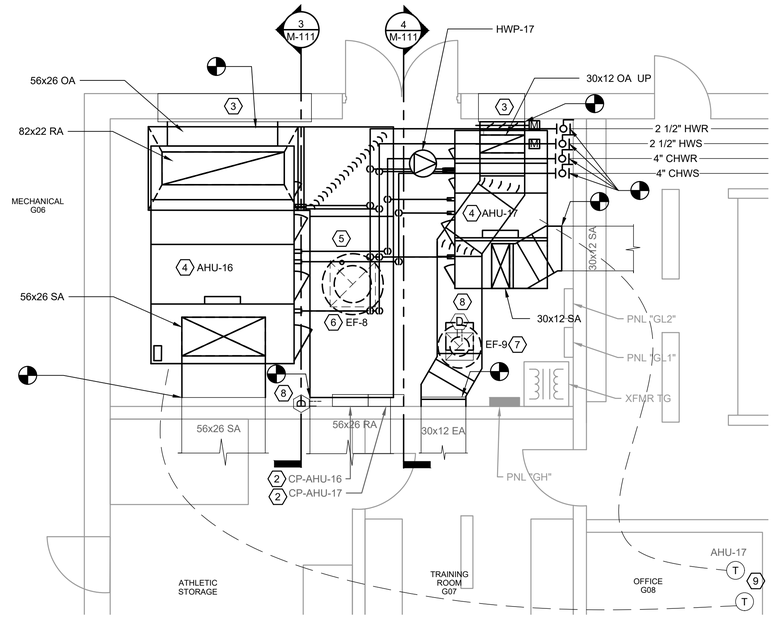
M-001

SHEET NO.



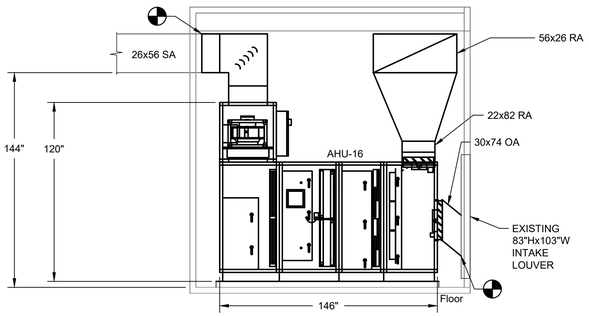
1 FIRST FLOOR DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



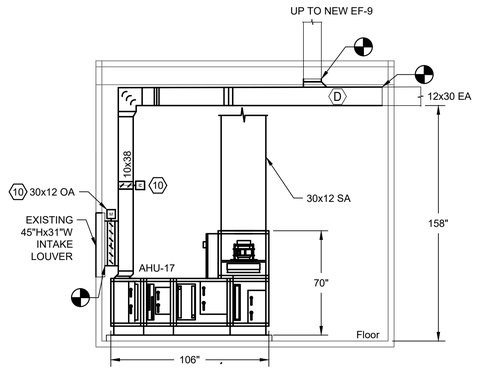
2 FIRST FLOOR NEW WORK PLAN

SCALE: 1/4" = 1'-0"



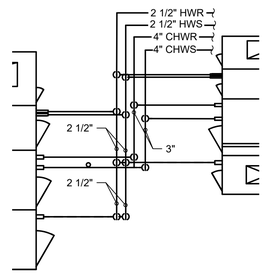
3 AHU-16 SECTION NEW WORK

SCALE: 1/4" =1'-0"



4 AHU-17 SECTION NEW WORK

SCALE: 1/4" =1'-0"



5 ENLARGED PIPING PLAN

SCALE: 1/4" =1'-0"

GENERAL NOTES:

1. REFER TO M-001 FOR MECHANICAL GENERAL NOTES.
2. CONTRACTOR TO CONFIRM FIELD CONDITIONS. ANY DISCREPANCIES FOUND ON THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER FOR CLARIFICATION PRIOR TO PROCEEDING WITH ANY WORK.
3. ROOF MODIFICATIONS AND REPAIRS SHALL MEET THE REQUIREMENTS OF THE ROOF WARRANTY.
4. REMOVE DUCTWORK, HANGERS, AND SUPPORTS TO POINT INDICATED. CAP AT TERMINATION POINT OR PREPARE FOR RECONNECTION AS SHOWN IN NEW WORK. PROVIDE ANY TRANSITIONS, HANGERS, AND SUPPORTS TO CONNECT TO NEW DUCT.
5. REMOVE PIPING, HANGERS, AND SUPPORTS BACK TO POINT INDICATED. CAP AT TERMINATION POINT OR PREPARE FOR RECONNECTION AS SHOWN IN NEW WORK. INSULATE PIPING WHERE CAPPED. PROVIDE PIPING, HANGERS, AND SUPPORTS NEEDED TO TRANSITION TO NEW PIPING.

(#) KEYNOTES:

1. DEMOLISH EXISTING AHU AND HOUSEKEEPING PAD. DISCONNECT PIPING AND DUCTWORK, DEMOLISH BACK TO POINT INDICATED AND PREPARE FOR RECONNECTION. CONTRACTOR RESPONSIBLE FOR DISPOSING OF ALL MATERIALS.
2. REPROGRAM EXISTING HONEYWELL AIR HANDLING UNIT AND EXHAUST FAN CONTROLLER AND EXPANSION MODULE TO MEET NEW CONTROL SEQUENCE. WIRE WITH NEW SENSORS, CONTROL VALVES, FAN START/STOP AND SPEED CONTROL WITH SEQUENCING. PROVIDE NEW POINTS TO MEET CONTROL SCHEMATIC. PROVIDE NEW PREHEAT COIL CONTROL VALVES, REUSE EXISTING CHILLED WATER, AND REUSE EXISTING HEATING VALVE FOR REHEAT COIL. INTEGRATE NEW AHU SUPPLY FAN CONTROL PANELS AND RELIEF FAN VFD INTO BACNET COMMUNICATION NETWORK. UPDATE GRAPHICS, SCHEDULING, AND TRENDING. SEE SCHEMATIC AND SCHEDULE FOR ADDITIONAL INFORMATION. EXISTING CONTROL POWER AND PANEL MAY BE REUSED.
3. EXISTING INTAKE LOUVER TO REMAIN. MODIFY PLENUM DRAIN AS NECESSARY FOR NEW WORK. PROVIDE NEW OUTSIDE AIR DUCT FROM PLENUM TO AHU.
4. RECEIVE, RIG, AND INSTALL OWNER FURNISHED (PRE-PURCHASED) AHU ON 4" HOUSEKEEPING PAD. MAKE ALL DUCT, PIPING, POWER AND CONTROL CONNECTIONS.
5. ROUTE CONDENSATE PIPING FROM AHU TO EXISTING FLOOR DRAIN.
6. CONNECT NEW RELIEF AIR DUCT TO APPROXIMATELY 30X30 EXISTING RELIEF AIR DUCT UP TO ROOF CURB FOR EF-8. PROVIDE ROOF CURB ADAPTER AND NEW EF-8 WITH BACKDRAFT DAMPER ON ROOF WITH VFD LOCATED IN MECHANICAL ROOM. CONTRACTOR TO VERIFY EXISTING CURB DIMENSIONS PRIOR TO ORDERING CURB ADAPTER.
7. CONNECT NEW EXHAUST AIR DUCT TO APPROXIMATELY 18x18 EXISTING EXHAUST AIR DUCT UP TO ROOF CURB FOR EF-9. PROVIDE CURB ADAPTER AND NEW EF-9 WITH BACKDRAFT DAMPER ON ROOF WITH STARTER LOCATED IN MECHANICAL ROOM. CONTRACTOR TO VERIFY EXISTING CURB DIMENSIONS PRIOR TO ORDERING.
8. EXISTING DUCT SMOKE DETECTORS TO REMAIN. RELOCATE AHU-17/EF-9 DUCT SMOKE DETECTOR INTO NEW DUCTWORK BEFORE DUCT SPLIT. COORDINATE LOCATIONS WITH CONNECTIONS TO NEW DUCTWORK. PROVIDE 12x12 ACCESS DOOR FOR INSPECTION AND TESTING.
9. WALL MODULE LOCATIONS FOR OCCUPANCY OVERRIDE AND SETPOINT CONTROLS. REFER TO G-003 FOR SPACE CONDITIONS SENSING LOCATIONS.
10. PROVIDE LOW LEAKAGE MOTORIZED CONTROL DAMPERS WITH BLADE SEALS, EXTERIOR LINKAGE, AND ACTUATORS WITH END SWITCHES FOR AHU-17 IN OUTSIDE AIR AND EXHAUST AIR DUCT TO MATCH DUCT SIZE. OFFSET DUCTWORK AS NEEDED TO FIT OUTSIDE AIR DAMPER BETWEEN LOUVER AND DUCTWORK WITH ADEQUATE ACCESS FOR SERVICE AND REPLACEMENT.

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SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042050 JEFFERSON L. HOCKADAY

3/31/2025

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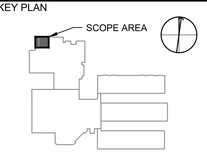

FIRST FLOOR | NTS
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MECHANICAL DEMOLITION & NEW WORK PLANS

PROJECT NO. 50185618

M-111

SHEET NO.

4/1/2025 3:55:00 PM
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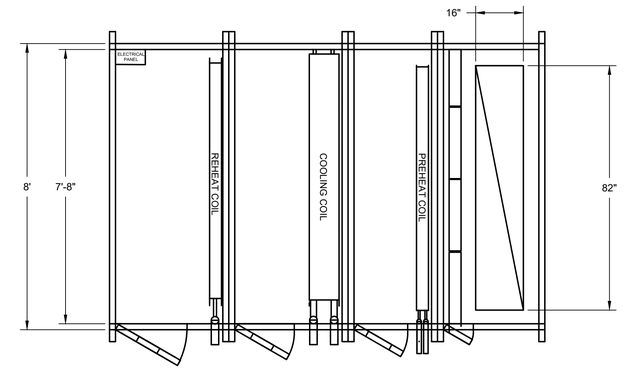
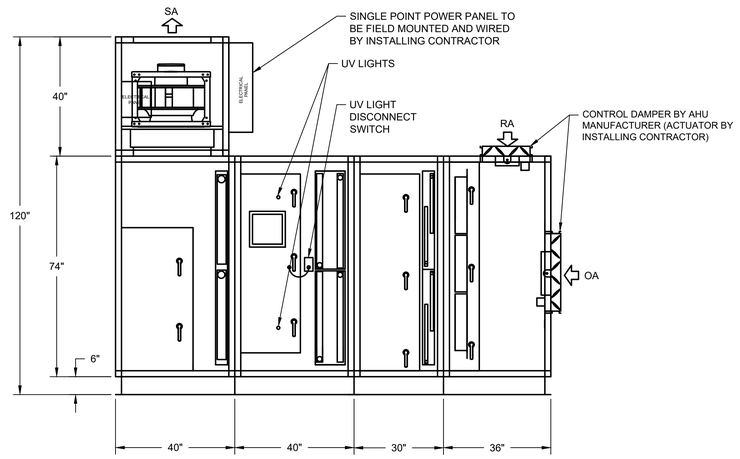
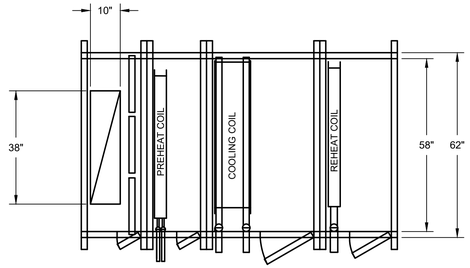
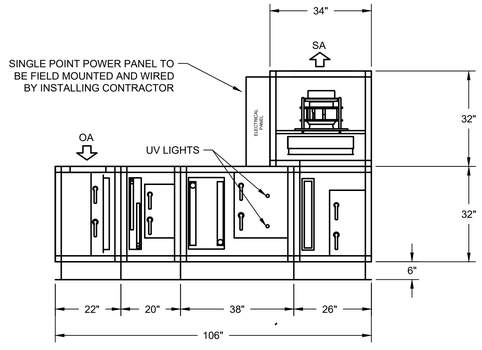


1 AHU 16 SECTION 1 — SCALE: NTS

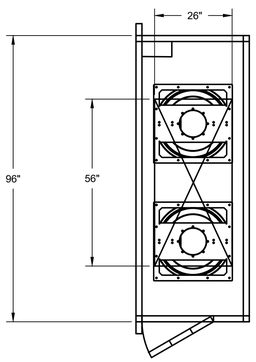


3 AHU 16 SECTION 2 — SCALE: NTS

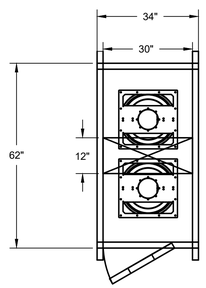




2 AHU 17 SECTION 1 — SCALE: NTS



4 AHU 17 SECTION 2 — SCALE: NTS



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JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS
CLAYTON MIDDLE SCHOOL
AHU 16 AND 17 REPLACEMENT
490 GUY RD,
CLAYTON, NC 27520
CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042056 VERSON L. HOCKADAY

3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY WH
CHECKED BY JT
DATE 3/31/2025

TITLE
DETAILS

PROJECT NO. 50185618

M-501

SHEET NO.

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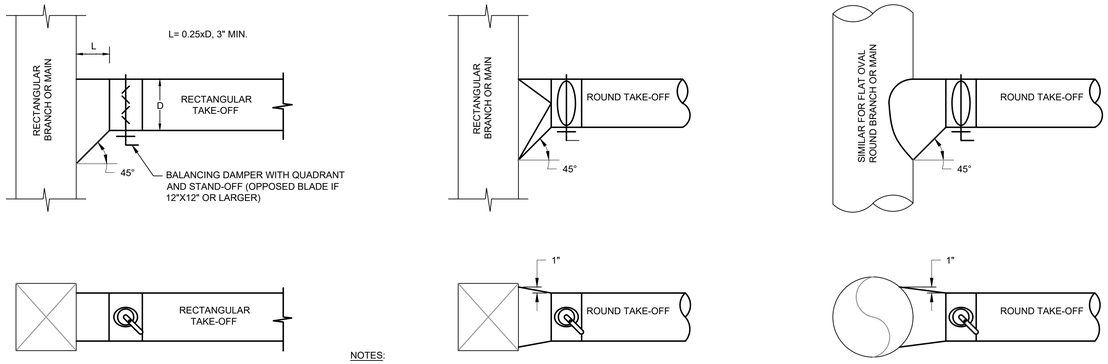


NOTES:

1. PROVIDE 45° LATERAL WYE TAKE-OFFS.
2. WHEN SPACE DOES NOT ALLOW 45° LATERAL WYE TAKE-OFF, USE 90° CONICAL TEE CONNECTIONS.
3. STRAIGHT IN FACTORY BUILT CONNECTIONS ARE PERMITTED FOR:

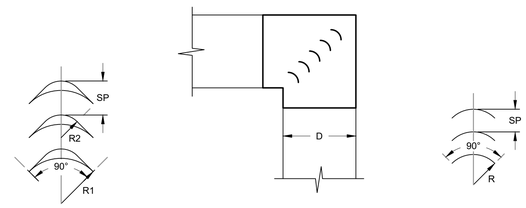
A. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS FOR EXHAUST OR RETURN AIR APPLICATIONS.
B. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS ON THE LOW PRESSURE SIDE OF TERMINAL BOXES.

4. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.

1 DUCT 45° LATERAL TAKE-OFF

SCALE: NTS

233113-005



DOUBLE VANE SCHEDULE						
	D	H	R1	R2	SP	GA
LARGE	>18"	>18"	4-1/2"	2-1/4"	3-1/4"	24

SINGLE VANE SCHEDULE					
	D	H	R	SP	GA
SMALL	≤18"	≤18"	2"	1-1/2"	24

MAXIMUM UNSUPPORTED VANE LENGTH LARGE DOUBLE VANE 72"

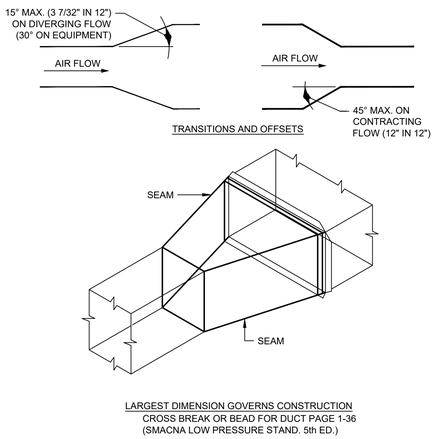
NOTES:

1. SINGLE VANES ALLOWED IN ELBOWS LESS THAN OR EQUAL TO 18" X 18".
2. TURNING VANES NOT REQUIRED IN ELBOWS SMALLER THAN 12" X 12"

2 DUCT MITERED 90° ELBOW

SCALE: NTS

233113-007

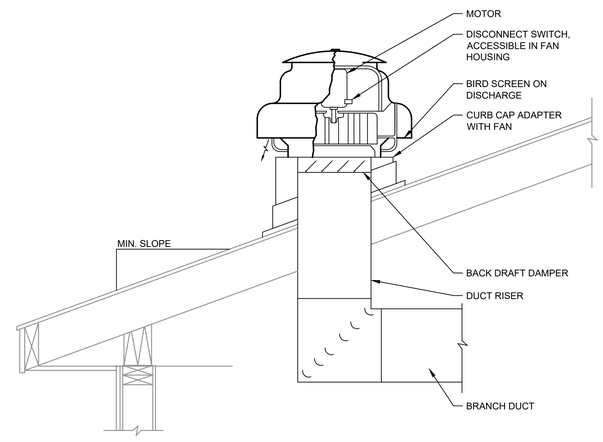


LARGEST DIMENSION GOVERNS CONSTRUCTION
CROSS BREAK OR BEAD FOR DUCT PAGE 1-36
(SMACNA LOW PRESSURE STAND. 5th ED.)

3 DUCT TRANSITION

SCALE: NTS

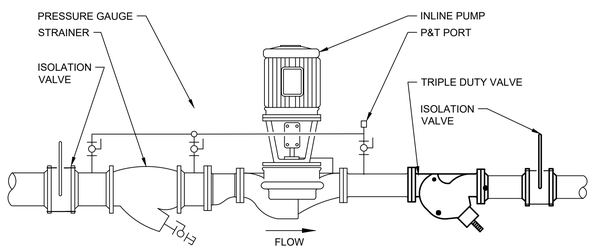
233113-009



4 SLOPE ROOF MOUNTED EXHAUST/RELIEF FAN

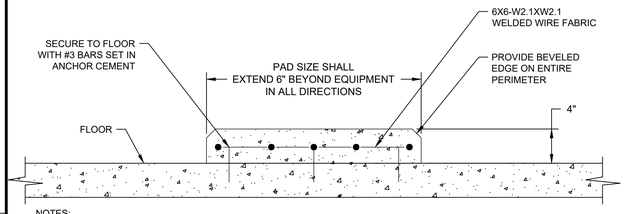
SCALE: NTS

232123-002



5 IN-LINE PUMP PIPING

SCALE: NTS



NOTES:

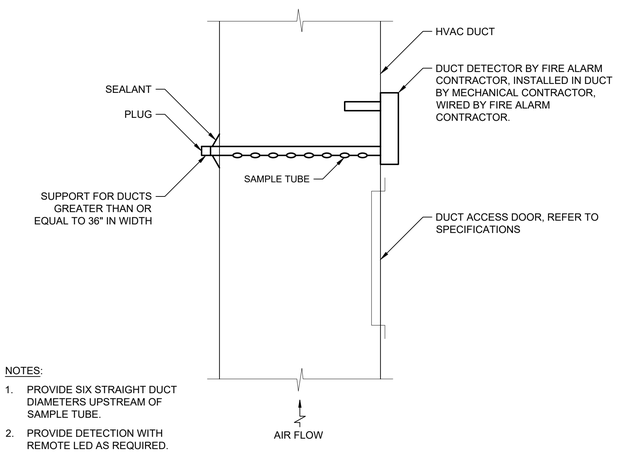
MECHANICAL CONTRACTOR SHALL PROVIDE PADS FOR AIR HANDLERS UNITS.

CONCRETE BLOCKS MAY BE USED TO EXTEND AN EXISTING PAD FOR AIR HANDLING UNIT REPLACEMENT WHERE BLOCKS OF EQUAL HEIGHT TO EXISTING PAD ARE LOCATED ALONG ALL JOINTS, CORNERS, AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS FOR SUPPORTS WHERE TIME DOES NOT PERMIT TO POUR CONCRETE.

6 HOUSEKEEPING PAD

SCALE: NTS

03-30-00-03



NOTES:

1. PROVIDE SIX STRAIGHT DUCT DIAMETERS UPSTREAM OF SAMPLE TUBE.
2. PROVIDE DETECTION WITH REMOTE LED AS REQUIRED.

7 DUCT DETECTOR

SCALE: NTS

283146-01

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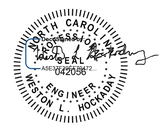

3/31/2025

KEY PLAN

SCALE

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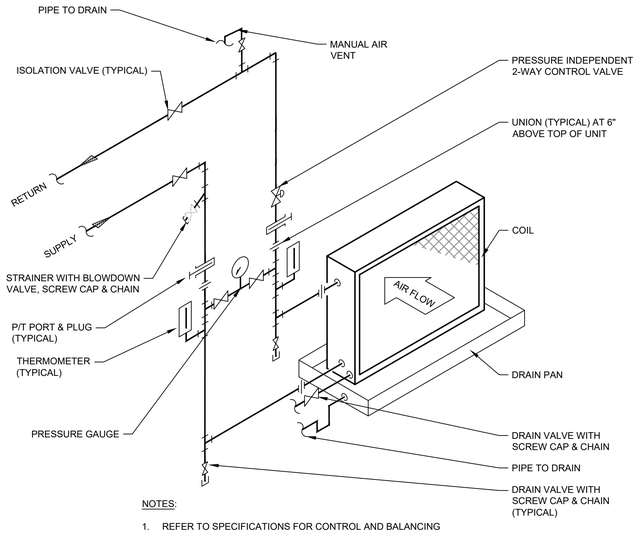
TITLE

DETAILS

PROJECT NO. 50185618

M-502

SHEET NO.

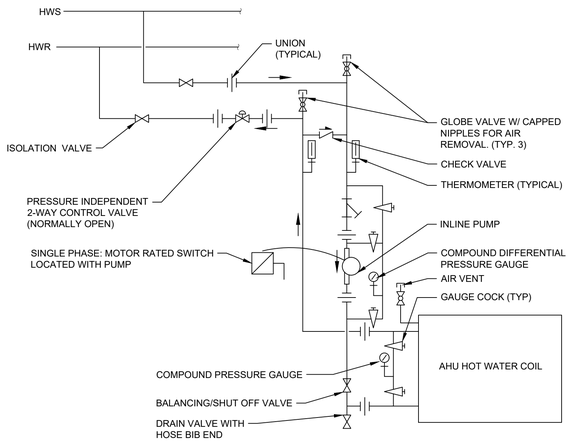


NOTES:

1. REFER TO SPECIFICATIONS FOR CONTROL AND BALANCING VALVE TYPES.
2. PROVIDE COIL BYPASS FOR PIPE FLUSHING AND REMOVE PRIOR TO FINAL CONNECTIONS.

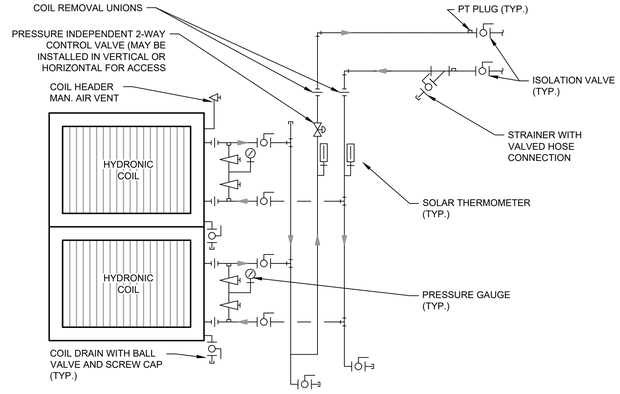
1 AIR HANDLING UNIT SINGLE COIL

SCALE: NTS



2 HOT WATER COIL WITH COIL PUMP

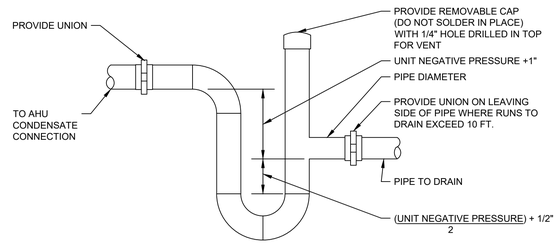
SCALE: NTS



3 MULTIPLE HYDRONIC COIL WITH PICV

SCALE: NTS

236426-004



EQUIPMENT CAPACITY	MIN. PIPE DIAMETER
MATCH EQUIPMENT CONDENSATE DISCHARGE	
AHU 17	0'-1"
AHU 16	0'-1 1/4"

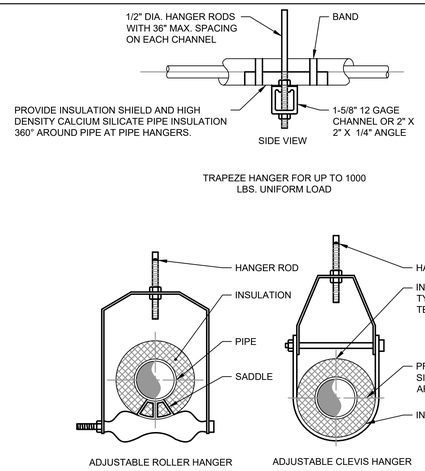
NOTES:

1. ALL CONDENSATE PIPING SHALL BE PVC OR TYPE L HARD COPPER. SIZED TO MATCH AHU OUTLET. RUN FULL SIZE TO DRAIN.
2. INSULATE DRAIN PIPING WITH CLOSED CELL INSULATION.

4 AHU DRAIN TRAP - DRAW THROUGH

SCALE: NTS

237300-001

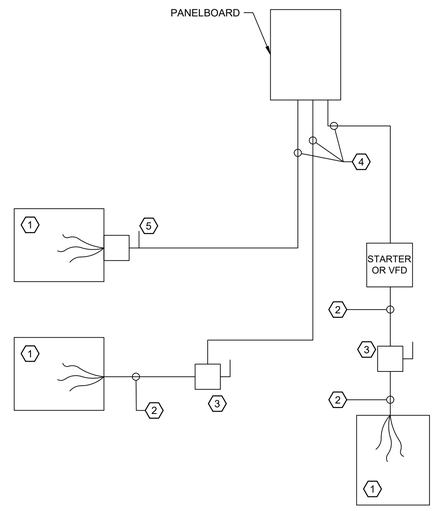


5 TYPICAL PIPE HANGERS

SCALE: NTS

KEYNOTES:

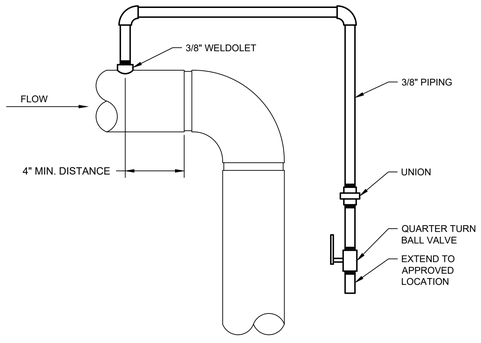
1. EQUIPMENT OF TRADES OTHER THAN ELECTRICAL.
2. CONDUIT & WIRING BY ELECTRICAL CONTRACTOR.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC IT SHALL BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.
4. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULE FOR BREAKER SIZES AND BRANCH OR FEEDER SCHEDULES FOR WIRE/CONDUIT SIZES.
5. EQUIPMENT PROVIDED WITH INTEGRAL DISCONNECTING MEANS.
6. IN ALL CASES THE CONTRACTOR SUPPLYING THE EQUIPMENT SHALL MAKE FINAL CONNECTIONS, START UP, AND TEST EQUIPMENT.



6 ELECTRICAL TO MECHANICAL EQUIPMENT

SCALE: NTS

E002-13



7 MANUAL AIR VENT ON MAIN

SCALE: NTS

232113-003

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CONSTRUCTION DOCUMENTS

SEAL

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3/31/2025

KEY PLAN

SCALE

REVISIONS

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PROJECT NO. 50185618

M-503

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SEMI CUSTOM AIR HANDLING UNIT SCHEDULE
OWNER PURCHASED, CONTRACTOR INSTALLED

			MARK	AHU-16	AHU-17
			SERVICE	GYM AREA	LOCKERS
			MECHANICAL ROOM	MECH RM G06	MECH RM G06
			TYPE	SEMICUSTOM INDOOR	SEMICUSTOM INDOOR
			BASIS OF DESIGN MANUFACTURER	DAIKIN VISION	DAIKIN VISION
			TOTAL CAPACITY AIR FLOW (CFM)	16,500	2,650
			TOTAL CONNECTED AIR FLOW (CFM)	16,400	2,400
OA			ECONOMIZER (Y/N)	Y (RELIEF FAN)	N
OA			DESIGN MAX. VENT. AIR FLOW (CFM)	6,925	2,400
OA			DEMAND CTRL. MIN. VENT. AIR FLOW (CFM)	1,200	2,400
FILTER	PRE		TYPE & THICKNESS	4" PLEATED PANEL	2" PLEATED PANEL
FILTER	PRE		LOAD STYLE	SIDE LOAD	SIDE LOAD
FILTER	PRE		SIZE (QUANTITY)	20x20 (3) / 20x24 (9)	20x24 (3)
FILTER	PRE		MAX. FACE VELOCITY (FPM)	450	450
FILTER	PRE		INITIAL APD (IN WG)	0.37	0.25
FILTER	PRE		FINAL APD (IN WG)	0.73	0.50
FILTER	PRE		EFFICIENCY (MERV)	8	8
PREHEAT COIL	AIR		COIL FLOW (CFM)	16,500	2,650
PREHEAT COIL	AIR		EAT (Fdb)	30.0	0.0
PREHEAT COIL	AIR		LAT (Fdb)	55.0	55.0
PREHEAT COIL	AIR		MAX. FACE VELOCITY (FPM)	620	500
PREHEAT COIL	AIR		MAX. APD (IN WG)	0.15	0.18
PREHEAT COIL	HEATING WATER		CAPACITY (MBH)	447.6	158.1
PREHEAT COIL	HEATING WATER		EWT (F)	150.0	150.0
PREHEAT COIL	HEATING WATER		LWT (F)	120.0	120.0
PREHEAT COIL	HEATING WATER		TOTAL FLOW (GPM)	30	10.75
PREHEAT COIL	HEATING WATER		MIN. ROWS	1	1
PREHEAT COIL	HEATING WATER		MIN. FINS PER INCH	10	14
PREHEAT COIL	HEATING WATER		MAX. WPD (FT)	7.0	4.7
PREHEAT COIL	HEATING WATER		MIN. TUBE VELOCITY (FT/S)	4.0	3.8
PREHEAT COIL	HEATING WATER		PIPE SIZE (INCHES) (PER COIL)	1.5	1.5
PREHEAT COIL	HEATING WATER		CONTROL VALVE	2-WAY PI	2-WAY PI
COOLING COIL	AIR		COIL FLOW (CFM)	16,500	2,650
COOLING COIL	AIR		EAT (Fdb/Fwb)	81.8/65.7	95.0/78.0
COOLING COIL	AIR		LAT (Fdb/Fwb)	53.1/52.6	53.3/53.1
COOLING COIL	AIR		MAX. FACE VELOCITY (FPM)	480	375
COOLING COIL	AIR		MAX. APD (IN WG)	0.75	0.31
COOLING COIL	CHILLED WATER		TOT. CAP. (MBH)	642.3	237.7
COOLING COIL	CHILLED WATER		SENS. CAP. (MBH)	497.2	114.5
COOLING COIL	CHILLED WATER		EWT (F)	45.0	45.0
COOLING COIL	CHILLED WATER		LWT (F)	57.0	57.0
COOLING COIL	CHILLED WATER		FLOW (GPM)	107.25	39.75
COOLING COIL	CHILLED WATER		MIN. ROWS	6	8
COOLING COIL	CHILLED WATER		MIN. FINS PER INCH	12	10
COOLING COIL	CHILLED WATER		MAX. WPD (FT)	11.1	9.6
COOLING COIL	CHILLED WATER		PIPE SIZE (INCHES) (PER COIL)	2	2
COOLING COIL	CHILLED WATER		CONTROL VALVE	2-WAY PI	2-WAY PI
SUPPLY AIR FAN			TYPE	PLENUM	PLENUM
SUPPLY AIR FAN			DRIVE TYPE	DIRECT	DIRECT
SUPPLY AIR FAN			TOTAL CAPACITY AIR FLOW (CFM)	16,500	2,650
SUPPLY AIR FAN			TOTAL CONNECTED AIR FLOW (CFM)	16,400	2,400
SUPPLY AIR FAN			SPEED (RPM)	2,387	1,856
SUPPLY AIR FAN			DESIGN MAX. SPEED (RPM)	2,425	2,890
SUPPLY AIR FAN			MIN. WHEEL DIAMETER (IN)	22	18
SUPPLY AIR FAN			TSP (IN WG)	4.27	3.1
SUPPLY AIR FAN			ESP (IN WG)	2.25	1.25
SUPPLY AIR FAN			NUMBER OF FANS (MINIMUM)	2.0	2.0
SUPPLY AIR FAN	PER FAN		BRAKE HORSEPOWER (HP)	8.9 HP	1.4 HP
SUPPLY AIR FAN	PER FAN		NOMINAL MOTOR RATING (HP)	9.86 HP	6 HP
SUPPLY AIR FAN	PER FAN		SPEED (RPM)	2425	2890
SUPPLY AIR FAN	PER FAN		VOLTAGE/PHASE	480/3	480/3
SUPPLY AIR FAN	PER FAN		STARTER/DISCONNECTING MEANS	EC+ BACnet CONTROLLER (0-10V) WITH DISCONNECT	EC+ BACnet CONTROLLER (0-10V) WITH DISCONNECT
REHEAT COIL	AIR		COIL FLOW (CFM)	16,500	2,650
REHEAT COIL	AIR		EAT (Fdb)	55.0	55.0
REHEAT COIL	AIR		LAT (Fdb)	90.0	90.0
REHEAT COIL	AIR		MAX. FACE VELOCITY (FPM)	450	400
REHEAT COIL	AIR		MAX. APD (IN WG)	0.17	0.18
REHEAT COIL	HEATING WATER		CAPACITY (MBH)	626.6	100.6
REHEAT COIL	HEATING WATER		EWT (F)	150.0	150.0
REHEAT COIL	HEATING WATER		LWT (F)	120.0	120.0
REHEAT COIL	HEATING WATER		FLOW (GPM)	42	6.75
REHEAT COIL	HEATING WATER		MIN. ROWS	2	2
REHEAT COIL	HEATING WATER		MIN. FINS PER INCH	9	8
REHEAT COIL	HEATING WATER		MAX. WPD (FT)	2.6	0.4
REHEAT COIL	HEATING WATER		PIPE SIZE (INCHES)	2.5	1.25
REHEAT COIL	HEATING WATER		CONTROL VALVE	2-WAY PI	2-WAY PI
			UVGI LAMPS	YES (740 W / 120V)	YES (160 W / 120V)
			FOOTPRINT (IN x IN)	146"Lx96"W	106"Lx62"W
			HEIGHT (IN)	74" COIL SECTION & 120" FAN DISCHARGE	32" COIL SECTION & 70" FAN DISCHARGE
			SA CONNECTION	TOP / 56"x26"	TOP / 30"x12"
			RA CONNECTION	TOP / 92"x26"	NA
			OA CONNECTION	END / 74"x30"	TOP / 38"x10"
			RELIEF CONNECTION	NA	NA
			UNIT SINGLE POINT CONNECTION MCA/MOCP	22.66/30	13.99/20
			WEIGHT (LBS)	6,704	3,146
			NOTES	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8,9

NOTES:

1. REFER TO SECTION 237319 - AHUS FOR ADDITIONAL REQUIREMENTS. REFER TO UNIT DETAILS AND DIAGRAMS FOR COMPLETE CONFIGURATION AND DIMENSIONAL DETAILS.
2. PROVIDE FAN STARTING AND DISCONNECTING MEANS AS SCHEDULED. (ECMi = INTELLIGENT ELECTRICALLY COMMUTATED MOTOR WITH 0-10V SIGNAL SPEED CONTROL WITH THERMAL OVERLOAD AND DISCONNECT OR VFD = VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT)
3. UNIT CASING, COIL CAPACITIES AND COMPONENT APD'S ARE BASED ON THE TOTAL CAPACITY SUPPLY FAN AIRFLOW. TOTAL CONNECTED SUPPLY AIRFLOW IS INTENDED FOR TAB PURPOSES ONLY.
4. INTERNAL STATIC PRESSURE SHALL INCLUDE SCHEDULED PRESSURE FOR DIRTY FILTERS.
5. MOTORS SHALL NOT EXCEED 3000 RPM FOR DIRECT-DRIVE FANS IN ARRAY CONFIGURATIONS.
6. PROVIDE STAINLESS STEEL COOLING COIL FRAME AND PAN WITH DISCHARGE ABOVE BASE RAIL.
7. UNIT SECTIONS MUST FIT THROUGH MECHANICAL ROOM DOUBLE DOOR.
8. PROVIDE MINIMUM 5-INCH HIGH CONTINUOUS PERIMETER AND INTERMEDIATE BASERAILS.
9. PROVIDE ELECTRICAL PANEL FOR FAN ARRAY SINGLE POINT OF POWER CONNECTION WITH DISCONNECT.

FAN SCHEDULE

MARK	SERVICE	TYPE	MANUFACTURER / MODEL	AIR FLOW (CFM)	ESP (IN WG)	EC MOTOR (Y or N)	DRIVE TYPE	SPEED (RPM)	BRAKE MOTOR (HP)	NOMINAL MOTOR (HP)	MAX. SOUND (SONES)	DAMPER TYPE	VOLTAGE/ PHASE	STARTER/ DSCNNCT MEANS	NOTES
EF-8	AHU 16 RELIEF AIR	DOWNBLAST DOME	COOK / 330 ACEB	14500	0.25	NO	BELT	663	3.9	5.0	26.0	GRAVITY	480/3	VFD	1,2,3,4,5
EF-9	AHU 17 EXHAUST AIR	DOWNBLAST DOME	COOK / 150C17D	2600	1.25	NO	DIRECT	1115	0.85	1.0	13.1	GRAVITY	208/3	MS/D	1,2,3,4,5

NOTES:

1. REFER TO SECTION 233400 FOR ADDITIONAL REQUIREMENTS.
2. PROVIDE STARTING AND DISCONNECTING MEANS AS SCHEDULED. (MRS = MOTOR RATED SWITCH; MS/D = COMBINATION MOTOR-STARTER AND DISCONNECT; VFD = VARIABLE FREQUENCY DRIVE; AND DISC = DISCONNECT)
3. PROVIDE VIBRATION ISOLATORS AND EQUIPMENT SUPPORTS. COORDINATE EXACT LOCATION OF ROOF OPENINGS AND STRUCTURAL SUPPORT.
4. CONTRACTOR TO VERIFY AND SELECT FAN THAT MATCHES EXISTING ROOF CURB DIMENSIONS OR PROVIDE WITH CURB ADAPTER.
5. PROVIDE WITH GRAVITY BACKDRAFT DAMPER, HINGED BASE, AND CURB ADAPTER.

PUMP SCHEDULE

MARK	SERVICE	TYPE	MANUFACTURER / MODEL	SUCTION (IN DIA)	DISCHARGE (IN DIA)	IMPELLER (IN DIA)	FLOW (GPM)	HEAD (FT H2O)	EFF. (%)	SPEED (RPM)	BRAKE MOTOR (HP)	NOMINAL MOTOR (HP)	VOLTAGE/ PHASE	STARTER/ DSCNNCT MEANS	NOTES
HWP-17	AHU-17 PREHEAT	CLOSE-COUPLED IN-LINE	TACO / 1911	1.5	1.5	4.75	15	23	35%	1750	0.24	0.5	120/1	MS/D	1,2,3

NOTES:

1. REFER TO SECTION 232123 FOR ADDITIONAL REQUIREMENTS.
2. PROVIDE STARTING AND DISCONNECTING MEANS AS SCHEDULED. (MRS = MOTOR RATED SWITCH; MS/D = COMBINATION MOTOR-STARTER AND DISCONNECT; AND VFD = VARIABLE FREQUENCY DRIVE)
3. PUMPS MOTOR SELECTION SHALL BE BASED ON NON-OVERLOADING SERVICE.

VARIABLE FREQUENCY DRIVE SCHEDULE

MARK	VOLTS	PHASE	HP	BYPASS	NEMA ENCLOSURE	MANUFACTURER	MODEL NO.	NOTES
VFD-EF-8	480	3	5	YES	TYPE 1	ABB	ACH580VCR	1,2

NOTES:

1. REFER TO SECTION 230514 FOR ADDITIONAL REQUIREMENTS.
2. FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.

Dewberry

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JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS

CLAYTON MIDDLE SCHOOL

AHU 16 AND 17 REPLACEMENT

490 GUY RD,
CLAYTON, NC 27520

CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042050 ASEE2025-0472 JOSHUA L. TAYLOR WESTON L. HOCKADAY

3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY JT
CHECKED BY JT
DATE 3/31/2025

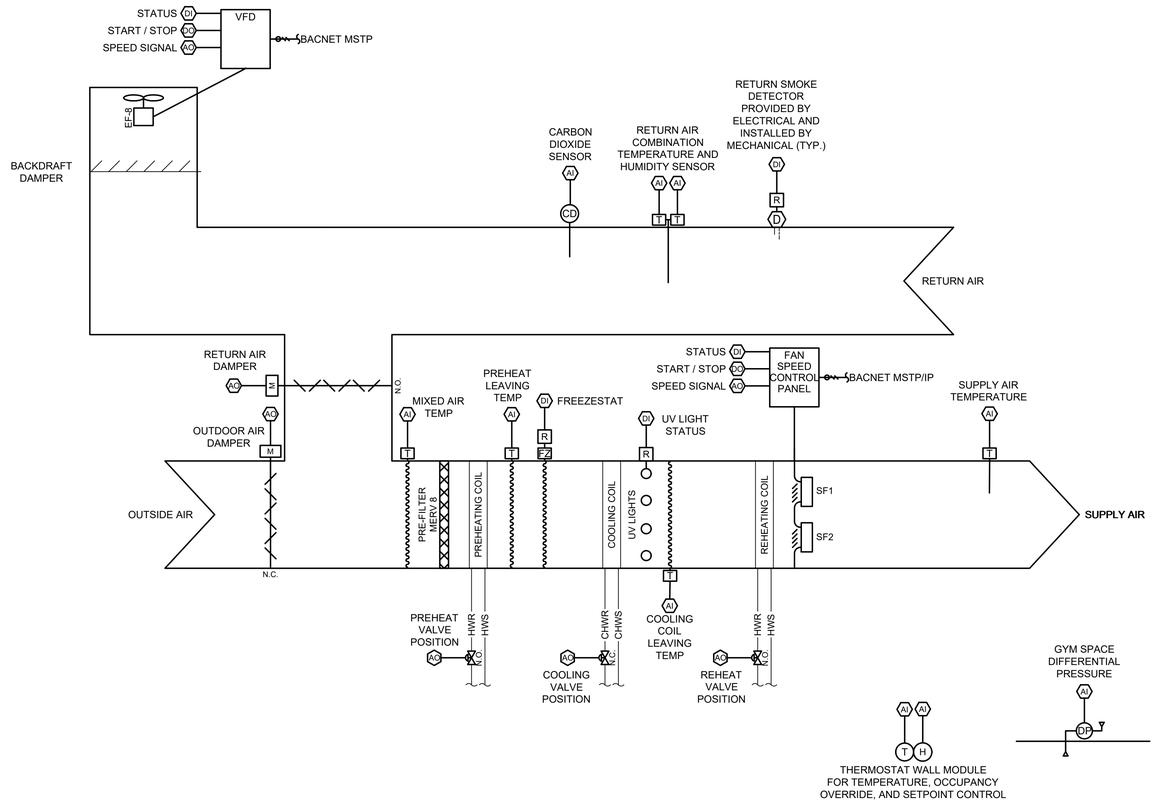
TITLE

SCHEDULES

PROJECT NO. 50185618

M-601

SHEET NO.



1 AHU16 SINGLE ZONE VARIABLE VOLUME AHU WITH RELIEF FAN

SCALE: NTS

0 - SINGLE ZONE (CHANGEOVER) VAV AIR HANDLING UNITS – CHILLED, PREHEAT, REHEAT, AND ECONOMIZER & RELIEF FAN

0.1. Operation

A. Safety Devices: Safeties shall be in operation at all times (Fan in auto, hand, override, etc). Fan command/status mismatch is proxy for safety alarm(s).

1. Return Smoke Detector Shutdown: When the fire alarm is active, stop fan. Generate an alarm. Safety shall be hardwired and require manual reset (via fire alarm system control panel).
2. Freeze Protection
   a. If mixed air temperature falls below 39°F (adj), generate an alarm.
3. Freezestat: When the freezestat senses temperature below 37°F, stop fans, open cooling and heating coil valve, and return all other valves and dampers to failed positions. Generate an alarm. Safety shall be hardwired and require manual reset. BAS shall enable HW plant and enable CHW pumps for water circulation. A freezestat trip shall override valve commands for all other safeties (i.e. during simultaneous safety trips, the freezestat valve operation shall take precedent)
4. After all safeties have cleared, allow AHU operation.

B. Supply Fan Wall Array

1. The supply fan array shall run continuously in occupied mode.
2. Determine fan status(s) through a current sensor. If a fan fails to start as commanded, generate an alarm.
3. On a signal to start, after all safeties have been cleared, energize the fan.
4. Once outdoor air damper status is proved open, enable the relief fan.
5. The supply fan array speed shall modulate in conjunction with the cooling and reheating coils to maintain space conditions. See "Space Temperature Control" for additional requirements.

C. Relief Fan

1. If the fan fails to start as commanded, generate an alarm.
2. A single space pressure control loop for each pressure zone shall modulate, from 0-100%, to maintain the building pressure at a setpoint, initially set to 0.05 in. wg (adj.). Upon a rise in space differential pressure above the setpoint, the loop shall increase. As the space differential pressure falls below the setpoint, the loop shall decrease.
   a. Single DP sensor AHUs: space pressure setpoint shall be verified and determined by TAB, initially +0.05 in wg (adj.). If DP sensor signal goes to zero or infinity, generate an alarm and stop the relief fan.
   b. Reference the DP sensor location(s) on the BAS floorplan.
3. Once the outdoor air damper is proven open, and the space pressure control loop has risen above an adjustable threshold, equal to the minimum relief fan speed, initially 15% (adj.), and supply fan(s) status is proven, after all safeties have been cleared, energize the relief fan.
4. Fan speed signal shall be equal to the space pressure loop output but no less than the minimum speed.
5. Once the space pressure control loop has fallen below minimum fan speed, stop the relief fan.

D. Outside, Return, and Relief Dampers

1. General
   a. The outside and return dampers shall have a minimum ventilation, economizer, and demand control ventilation (DCV) mode. Display the active mode on the graphics.
   b. The outside and return dampers shall be modulated using a single signal with an output of 0-100%. The outside air damper shall be modulated from 0-100% on a signal of 0-50%, then the return air damper shall be modulated from 100%-0% on a signal of 50-100%.
   c. The relief shall be barometric damper control.
2. Minimum Ventilation Operation
   a. When the fan is running, the outside and return dampers are indexed to the active minimum outside air (min OA) position, to be determined by TAB based on DCV.
      A) Note to TAB contractor: The position of each damper shall be determined individually to maintain the design OA flow (see AHU schedule) as the fan modulates. Record each position at design and minimum fan speeds and provide to BAS Contractor for balance point in programming (non-adj). Do not use actuator end-stops for balancing.
   B) Active minimum outside air damper (min OA) position setpoint will be reset linearly by the BAS between the two positions required at minimum and maximum fan speeds. The minimum outdoor air damper position will be lesser at higher fan speeds.
3. Integrated Economizer Operation (OA Temperature/Humidity Enable)
   a. When the fan is running, the outside air temperature falls below 65°F (adj), and the outside air enthalpy falls below 28 BTU/lb (adj), modulate the outside and return air dampers to maintain the mixed air temperature at 2°F (adj.) degrees below the active supply air setpoint.
   b. When the outside air temperature falls below 35°F (adj), disable economizer mode.
   c. If the economizer cannot maintain the space temperature at the cooling setpoint, enable mechanical cooling to help maintain setpoint.
4. Demand Control Ventilation Operation (DCV)

Device	UNOCC.	WARMUP	OCCUPIED	OCCUPIED MIN VENT
Outside Air Damper	CLOSE	CLOSED	DCV MIN	MINIMUM VENT

   a. Modulate the outside and return air dampers between the active minimum OA position at 1,200 ppm CO2 (adj) to the active DCV position (to be determined by TAB) at 800 ppm CO2 (adj).
      A) Note to TAB contractor: Each damper DCV position shall be determined individually until a measured building pressure of 0.02 to 0.05 in wg is achieved at exterior doors or common corridors for each area served by the AHU. Record each position at design and minimum fan speeds and provide to BAS Contractor for balance point in programming (non-adj). Do not use actuator end-stops for balancing.
      B) Active DCV outside air damper position setpoint will be reset linearly by the BAS between the two positions required at minimum and maximum fan speeds. The DCV outdoor air damper position will be lesser at higher fan speeds.
   b. If space CO2 remains above 1,200 ppm for 30 minutes, generate an alarm.

E. Space Temperature Control

1. The supply fan array, chilled water, and heating coils shall all work in unison to maintain space conditions.
2. The AHU shall have a space heating setpoint (68°F, adj) and a cooling setpoint (72°F, adj).
3. Chilled Water Coil (CHW) - Cooling Operation
   a. The AHU shall have a PID which operates from 0-100% for cooling operation.
   b. When supply fans are running, and the cooling PID is greater than zero, modulate/index the mechanical cooling to maintain the supply air temperature setpoint of 55°F (adj).
   c. Provide adjustable supply air temperature reset based on OA temperatures.
   d. As the space cooling PID increases from 0-100%, the supply fan speed shall be reset between minimum (12,000cfm 70%, adj) and maximum cooling speeds (16,500cfm 100%, adj) to maintain the space at the cooling setpoint.
      A) Note to TAB contractor: The supply fan minimum speed shall be set based on the speed required to ensure minimum OA flow can be maintained even at minimum fan speed. The supply fan maximum cooling speed shall be set to achieve design airflow for the AHU.
4. Deadband Operation
   a. When the AHU is between the heating and cooling setpoints, the AHU shall operate at minimum fan speed, and chilled water and preheat valves modulate to maintain supply air temperature setpoint.
5. Heating Reheat Coils (HW), Preheat Coil (PHW) - Heating Operation
   a. The AHU shall have a PID which operates from 0-100% for heating operation.
   b. When the supply fans are running, and the heating PID is greater than zero, modulate preheat control valve to maintain the preheat leaving air temperature setpoint at 55°F (adj).
   c. As the space heating PID increases from 0-100%, the heating supply air temperature setpoint shall be reset from 75°F to 95°F.
   d. When the supply fans are running, and the heating PID is greater than zero, modulate reheat control valve to maintain the active heating supply air temperature setpoint.
   e. As the space heating PID increases from 0-100%, the supply fan speed shall be reset between minimum (12,000cfm 70%, adj) and maximum heating speeds (16,500cfm 100%, adj) to maintain the space at the heating setpoint.
      A) Note to TAB contractor: The supply fan maximum heating speed shall be set to achieve 90°F supply air temperature with both heat stages (at design OA conditions).
   f. Low Limit Freeze Protection PID will modulate the preheat control valve to maintain preheat leaving air temperature at 50°F (adj).
   g. If the preheat control valve cannot maintain heating setpoint modulate reheat control valve maintain space temperature as second stage heating.

F. Dehumidification

1. If the relative humidity in the space rises above 60% (adj), turn on fan, modulate the cooling coil valve to maintain cooling coil discharge temperature setpoint of 53°F (adj.), and modulate reheat valve to maintain the space at the active cooling temperature setpoint. The unit shall return to normal operation when the return relative humidity falls below 55% (adj).
2. If return humidity remains above 65% (adj) for 15 minutes (adj), generate an alarm.
3. This applies to unoccupied and occupied operation.

G. Additional Control Requirements

1. Provide with wall module for space temperature, humidity, occupancy override, and setpoint control.
2. Monitor UV light status and shall run when fan is running. Provide with door switch disable.

0.2. Unoccupied Mode Operation

A. Unit shall operate as described above, except:

1. Fan mode shall cycle On/Off with heating and cooling demand, dampers shall be in off position. Outside air shall not be introduced unless economizer is active.
2. Increase cooling setpoint to 78°F (unoccupied cooling setpoint, adj) and decrease heating setpoint to 62°F (unoccupied heating setpoint, adj).
3. If the occupancy override is pressed, or the space temperature rises above the unoccupied cooling setpoint, or falls below the unoccupied heating setpoint, place the unit into preoccupancy mode. The AHU shall control to the occupied setpoints.
4. The unit shall return to unoccupied operation when occupied setpoints are reached, the minimum runtime of 30 minutes (adj) has been met, and the occupancy override expires.

0.3. Preoccupancy Mode Operation

A. Unit shall enter preoccupancy period prior to occupied period in accordance with optimum start/stop strategy.

B. Unit shall operate as described above, except:

1. Dampers shall be in off position. Outside air shall not be introduced unless economizer is active.

C. Enable morning warmup when outdoor air temperature is below 55°F (adj.) and heating load raises above a user defined setpoint, initially 50% (adj.). Start fans and modulate the reheat hot water control valve to provide morning warm up sequence during preoccupancy to maintain max heating discharge temperature setpoint.

0.4. Graphical Interface

A. Provide a graphical display for the Air Handling Unit, with a schematic of the unit and the following points:

- System on/off
- Occupancy status
- Freezestat, supply or return smoke, relief pressure low limit, and supply pressure high limit alarms
- Outside, return, and relief air damper commands
- Minimum Ventilation, Economizer, or Demand Control Ventilation mode
- Mixed air temperature, preheat leaving, and Economizer setpoints
- DCV setpoints
- Supply fan on/off, mode, and runtime
- Supply fan status, speed and alarm
- Relief fan status, speed, and on/off/alarm
- PHW/HW/CHW coil valve commands and heating/cooling mode
- Dehumidification mode and setpoints
- Space temperature and heating/cooling setpoints
- Space temperature setpoint max and min limits
- Space override status
- Return humidity, alarm, and alarm setpoint
- Return CO2 level, alarm and alarm setpoint
- Space differential pressure, setpoint, alarm, and alarm setpoints
- UV light status
- Supply, Cooling Coil, Mixed, Preheat leaving air temperatures and alarms

FAN INTERFACE MATRIX

POINT NAME	HARDWIRED	INTEGRATION	GRAPHIC DISPLAY
FAN COMMAND	X	X	HARDWIRED
FAN SPEED COMMAND (%)	X	X	HARDWIRED
FAN STATUS	X	X	HARDWIRED
FAN SPEED FEEDBACK (%)		X	COM
FAN CURRENT (A)		X	COM
FAN POWER (kW)		X	COM
FAN ALARM		X	COM
FAN IN HAND		X	COM
FAN AIRFLOW (CFM)		X	COM
FAN STATIC PRESSURE		X	COM
FAN STATIC SETPOINT		X	COM
FAN K-FACTOR		X	COM
FAN ARRAY RUNTIME		X	COM

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CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042058 WESLEY L. HOCKADAY

3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

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CONTROL SCHEMATIC & SEQUENCE

PROJECT NO. 50185618

M-701

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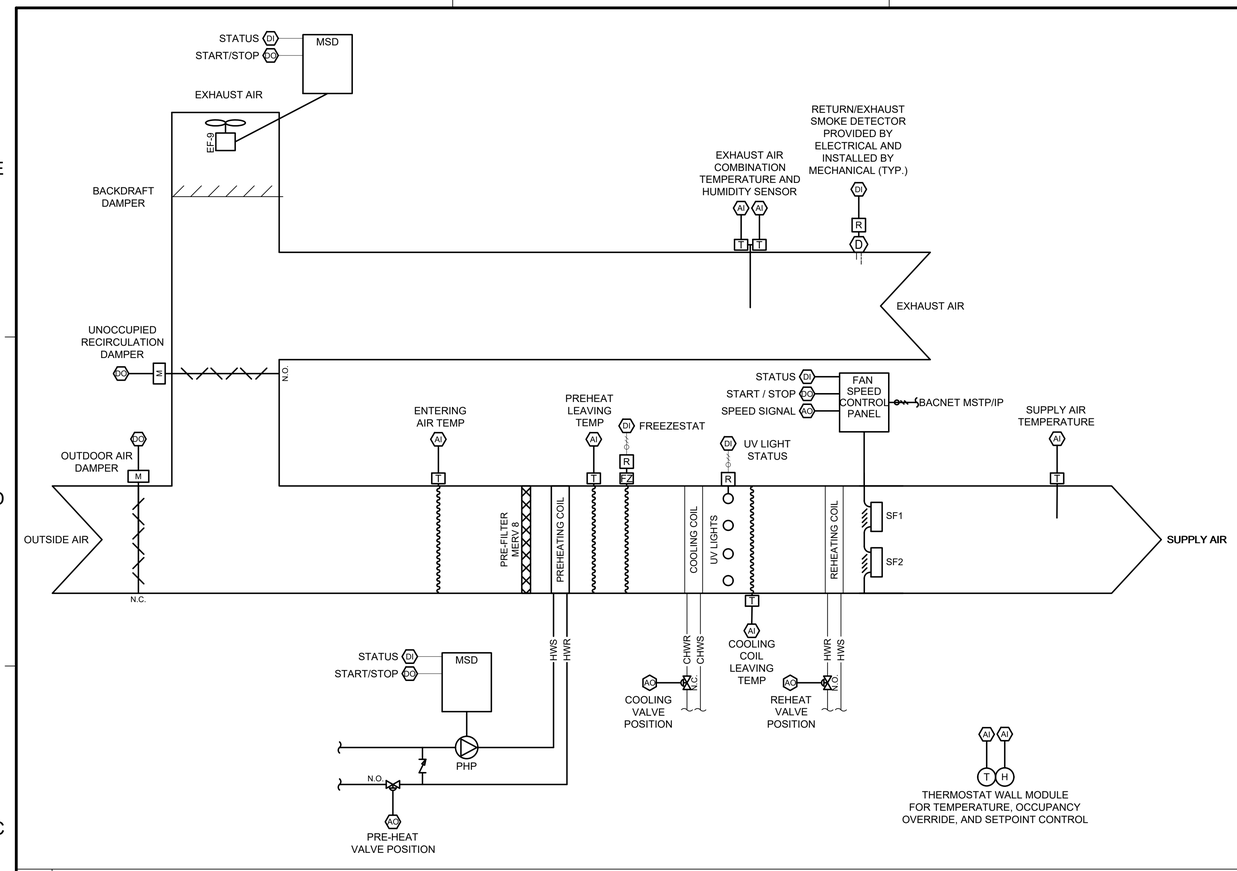

1 AHU17 SINGLE ZONE CONSTANT VOLUME 100% OA AHU, WITH UNOCCUPIED RECIRCULATION

SCALE: NTS

0 - SINGLE ZONE CONSTANT VOLUME DEDICATED OUTDOOR AIR SYSTEM (DOAS) WITH UNOCCUPIED RECIRCULATION

0.1. Operation

A. Safety Devices: Safeties shall be in operation at all times (Fan in auto, hand, override, etc). Fan command/status mismatch is proxy for safety alarm(s).

1. Freeze Protection
   a. If mixed air temperature falls below 39°F (adj), generate an alarm.
2. Freezestat: When the freezestat senses temperature below 35°F, stop fans, open cooling and heating coil valve, and return all other valves and dampers to failed positions. Generate an alarm. Safety shall be hardwired and require manual reset. BAS shall enable HW plant and enable CHW pumps for water circulation. A freezestat trip shall override valve commands for all other safeties (i.e. during simultaneous safety trips, the freezestat valve operation shall take precedent)
3. Fire Alarm Shutdown: When the fire alarm is active, stop fan. Generate an alarm. Safety shall be hardwired and require manual reset (via fire alarm system control panel).
4. After all safeties have cleared, allow AHU operation.

B. Supply Fan Wall Array

1. The supply fan array shall run continuously in occupied mode.
2. Determine fan status(s) through a current sensor. If a fan fails to start as commanded, generate an alarm.
3. On a signal to start, after all safeties have been cleared, energize the fan.
4. Once supply fan status is proved on, start general exhaust fan (s).
5. The supply fan array speed shall be commanded to a constant speed determined by TAB.
6. Provide supply fan enable delay timer, initially 90 seconds (adj.), to ensure the outdoor air damper is fully open before indexing supply fan to start.

C. Exhaust Fan

1. Exhaust fan will run continuously once the supply fan status is proven and delay timer is satisfied.
2. Determine fan status through a current sensor. Set current sensor to identify when belt broken. If a fan fails to start as commanded, generate an alarm. If fan belt is broken, generate an alarm.

D. Outside Dampers – 100% Makeup Air for Locker Rooms & Unoccupied Return Recirculation

1. General
   a. When all safeties are cleared, the outside dampers are indexed to the fully open position.
   b. Monitor outdoor air damper feedback and if damper fails to open as commanded, generate an alarm.

Device	UNOCCUPIED	OCCUPIED
Outside Air Damper	CLOSE	OPEN
Return Recirculation Damper	OPEN	CLOSED
Relief/Exhaust Fan Enable	OFF	ON

E. Space Temperature Control

1. The supply fan array, chilled water, and heating coils shall all work in unison to maintain space conditions.
2. The AHU shall have a space heating setpoint (68°F, adj) and a cooling setpoint (72°F, adj).
3. Chilled Water Coil (CHW) - Cooling Operation
   a. The AHU shall have a PID which operates from 0-100% for cooling operation.
   b. When supply fans are running, and the cooling PID is greater than zero, modulate/index the mechanical cooling to maintain the supply air temperature setpoint of 55°F (adj).
   c. Provide adjustable supply air temperature reset based on OA temperatures.
4. Deadband Operation
   a. When the AHU is between the heating and cooling setpoints, the AHU shall operate at minimum fan speed, and chilled water and preheat valves modulate to maintain supply air temperature setpoint.
5. Heating Reheat Coils (HW), Preheat Coil (PHW) - Heating Operation
   a. The AHU shall have a PID which operates from 0-100% for heating operation.
   b. When the supply fans are running, and the heating PID is greater than zero, modulate preheat control valve to maintain the preheat leaving air temperature setpoint at 55°F (adj).
   c. As the space heating PID increases from 0-100%, the heating supply air temperature setpoint shall be reset from 75°F to 95°F.
   d. When the supply fans are running, and the heating PID is greater than zero, modulate reheat control valve to maintain the active heating supply air temperature setpoint.
   e. Low Limit Freeze Protection PID will modulate the preheat control valve to maintain preheat leaving air temperature at 50°F (adj).
   f. If the preheat control valve cannot maintain heating setpoint modulate reheat control valve maintain space temperature as second stage heating.

F. Dehumidification

1. If the relative humidity in the exhaust rises above 60% (adj), turn on fan, modulate the cooling coil valve to maintain cooling coil discharge temperature setpoint of 53°F (adj.), and modulate reheat valve to maintain the space at the active cooling temperature setpoint. The unit shall return to normal operation when the return relative humidity falls below 55% (adj).
2. If return humidity remains above 65% (adj) for 15 minutes (adj), generate an alarm.
3. This applies to unoccupied and occupied operation.

G. Additional Control Requirements

1. Provide with wall module for space temperature, humidity, occupancy override, and setpoint control.
2. If space CO2 remains above 1,200 ppm for 30 minutes, generate an alarm.

0.2. Unoccupied Mode Operation

A. Unit shall operate as described above, except:

1. Supply Fan mode shall be cycle with heating and cooling, without circulation regardless of user selection.
2. Outdoor air damper shall close to allow recirculation flow to the supply fan array.
3. Exhaust fan shall remain off.
4. Return air recirculation and exhaust air isolation dampers shall be indexed to their unoccupied positions for full return airflow with NO outdoor airflow.
5. Increase cooling setpoint to 78°F (unoccupied cooling setpoint, adj) and decrease heating setpoint to 62°F (unoccupied heating setpoint, adj).
6. If the occupancy override is pressed, or the space temperature rises above the unoccupied cooling setpoint, or falls below the unoccupied heating setpoint, place the unit into preoccupancy mode. The AHU shall control to the occupied setpoints.
7. The unit shall return to unoccupied operation when occupied setpoints are reached, the minimum runtime of 30 minutes (adj) has been met, and the occupancy override expires.

0.3. Preoccupancy Mode Operation

A. Unit shall enter preoccupancy period prior to occupied period in accordance with optimum start/stop strategy.
B. Unit shall operate as described above.
C. Enable morning warmup when outdoor air temperature is below 55°F (adj.) and heating load raises above a user defined setpoint, initially 50% (adj.). Start fans and modulate the reheat hot water control valve to provide morning warm up sequence during preoccupancy to maintain max heating discharge temperature setpoint.

0.4. Graphical Interface

A. Provide a graphical display for the Air Handling Unit, with a schematic of the unit and the following points:

- System on/off
- Occupancy status
- Freezestat, Fire alarm, and other alarms
- Outside, Return Recirculation, and Exhaust Isolation air damper commands, status, and alarm
- Supply fan on/off, mode, and runtime
- Supply fan status and alarm
- Exhaust fan status, on/off/alarm
- Preheat Coil Pump status, on/off/alarm
- PHW/HW/CHW coil valve commands and heating/cooling mode
- Dehumidification mode and setpoints
- Space temperature and heating/cooling setpoints
- Space temperature setpoint max and min limits
- Space override status
- Exhaust CO2 level, alarm and alarm setpoint (where applicable)
- Supply, Cooling Coil, Entering, Preheat leaving air temperatures and alarms

FAN INTERFACE MATRIX

POINT NAME	HARDWIRED	INTEGRATION	GRAPHIC DISPLAY
FAN COMMAND	X	X	HARDWIRED
FAN SPEED COMMAND (%)	X	X	HARDWIRED
FAN STATUS	X	X	HARDWIRED
FAN SPEED FEEDBACK (%)		X	COM
FAN CURRENT (A)		X	COM
FAN POWER (kW)		X	COM
FAN ALARM		X	COM
FAN IN HAND		X	COM
FAN AIRFLOW (CFM)		X	COM
FAN STATIC PRESSURE		X	COM
FAN STATIC SETPOINT		X	COM
FAN K-FACTOR		X	COM
FAN ARRAY RUNTIME		X	COM

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JOHNSTON COUNTY PUBLIC SCHOOLS

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CONSTRUCTION DOCUMENTS

SEAL

3/31/2025

KEY PLAN

SCALE

REVISIONS

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DATE 3/31/2025

TITLE

CONTROL SCHEMATIC & SEQUENCE

PROJECT NO. 50185618

M-702

SHEET NO.

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ABBREVIATIONS - ELECTRICAL

THIS IS A MASTER ABBREVIATIONS LIST. SOME ABBREVIATIONS MAY NOT APPLY TO THIS PROJECT.

A, AMP	AMPERE
AC	ALTERNATING CURRENT
AC	ABOVE CEILING
AC	ARMORED CABLE
ADA	AMERICANS WITH DISABILITIES ACT
AF	AMPERE FRAME
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERES INTERRUPTING CAPACITY
AL, ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
AWS	ABOVE WORK SURFACE
BAS	BUILDING AUTOMATION SYSTEM
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
BRKR, BKR	BREAKER
C	CONDUIT
C/B, CB	CIRCUIT BREAKER
CATV	CABLE TELEVISION
CCTV	CLOSED CIRCUIT TELEVISION
cd	CANDELA
CKT	CIRCUIT
CL	CENTERLINE
CLF	CURRENT LIMITING FUSE
CLG	CEILING
COL	COLUMN
COMM	COMMUNICATION
CONV	CONVENIENCE
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRI	COLOR RENDERING INDEX
CT	CURRENT TRANSFORMER
CU	COPPER
DB	DUCTBANK
dB	DECIBEL
DC	DIRECT CURRENT
DIA	DIAMETER
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DWG	DRAWING
E, EX	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EC	EMPTY CONDUIT
ECB	ENCLOSED CIRCUIT BREAKER
EGB	EARTH, ELECTRICAL OR EQUIPMENT GROUND BAR
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EM, EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EOL	END OF LINE RESISTOR
EPO	EMERGENCY POWER OFF
EQ, EQP	EQUIPMENT
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH
FA	FIRE ALARM
FC	FOOT-CANDLE
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE CONDUIT CONNECTION
FLR	FLOOR
FO	FIBER OPTIC
FSS	FUSED SAFETY SWITCH
FTL	FEED-THRU LUGS
FU	FUSE
FURN	FURNITURE
FVNR	FULL VOLTAGE NON-REVERSING
G, GND	GROUND
GALV	GALVANIZED
GEN	GENERATOR
GFCI, GF	GROUND FAULT CIRCUIT INTERRUPTER
GFEP	GROUND FAULT EQUIPMENT PROTECTION
GFP	GROUND FAULT PROTECTION

ABBREVIATIONS - ELECTRICAL

THIS IS A MASTER ABBREVIATIONS LIST. SOME ABBREVIATIONS MAY NOT APPLY TO THIS PROJECT.

GRC, GRMC	GALVANIZED RIGID METALLIC CONDUIT
HCF MC	HEALTHCARE FACILITY METAL-CLAD
HID	HIGH INTENSITY DISCHARGE
HL	HORN LIGHT
HOA	HAND OFF AUTO
HORIZ	HORIZONTAL
HP	HORSE POWER
HT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HWP	HOT WATER PUMP
Hz	HERTZ, FREQUENCY
IDF	NTERMEDIARY DISTRIBUTION FRAME
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
INCAN	INCANDESCENT
INT	INTERLOCK
IPC	INTEGRATED POWER CENTER
IS	INTRINSICALLY SAFE
ISO	ISOLATED
JB, JBOX	JUNCTION BOX
K	KELVIN
KCMIL	THOUSAND CIRCULAR MILLS
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KVAR	KILOVOLT-AMPERES REACTIVE
KW	KILOWATT
KWH	KILOWATT-HOUR
LCP	LIGHTING CONTROL PANEL
LED	LIGHT EMITTING DIODE
LFMC	LIQUID TIGHT FLEXIBLE METALLIC CONDUIT
LP	LIGHTING PANEL
LRA	LOCKED ROTOR AMPS
LS	LIFE SAFETY
LS	LIMIT SWITCH
LSIG	LONG, SHORT, INSTANTANEOUS & GROUND
LTG	LIGHTING
LTS	LIGHTS
LV	LOW VOLTAGE
MC	METAL CLAD CABLE
MCA	MAXIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MDF	MAIN DISTRIBUTION FRAME
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MFR	MANUFACTURER
MI	MINERAL INSULATED
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTG	MOUNTING
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
MW	MEGAWATT
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NOT FUSED / NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFSS	NON-FUSED SAFETY SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHTING
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
O.L.	OVERLOAD
OCPD	OVERCURRENT PROTECTIVE DEVICE
P	POLE
PB	PULL BOX
PH, Ø	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
POE	POWER OVER ETHERNET
PP	POWER PANEL
PT	POTENTIAL TRANSFORMER

ABBREVIATIONS - ELECTRICAL

THIS IS A MASTER ABBREVIATIONS LIST. SOME ABBREVIATIONS MAY NOT APPLY TO THIS PROJECT.

PVC	POLYVINYL CHLORIDE
PWR	POWER
QTY	QUANTITY
R	REMOVE
RCP	REFLECTED CEILING PLAN
REC, RECP	RECEPTACLE
REQ, REQ'D	REQUIRED
RMC	RIGID METALLIC CONDUIT
RNC	RIGID NON-METALLIC CONDUIT
RP	RECEPTACLE PANEL
RTS	REMOTE TEST SWITCH
SBD, SWBD	SWITCHBOARD
SDP	SECONDARY DISTRIBUTION PANEL
SGR, SWGR	SWITCHGEAR
SP	SINGLE POLE
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SS	SAFETY SWITCH
ST	SHUNT TRIP
STD	STANDARD
STR	MOTOR STARTER
SW	SWITCH
SYM	SYMMETRICAL
TEL, TELE	TELEPHONE
TEMP	TEMPORARY
TGB	TELECOMMUNICATIONS GROUND BAR
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTABLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
V	VOLTS
VA	VOLT AMPERES
VAR	VOLT AMPERES REACTIVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOIP	VOICE OVER INTERNET PROTOCOL
W	WIRE
W	WATT
WG	WIRE GUARD
XFR, XFMR	TRANSFORMER

STANDARD WALL MOUNTING HEIGHT

DEVICE OR EQUIPMENT TYPE	MOUNTING HEIGHT (AFF/AFG)	MEASURED TO	NOTES
AV, COAX, DATA & TELECOM	18"/ SEE NOTES	CENTER	1, 3
ENCLOSED CIRCUIT BREAKERS	78"	TOP	1, 2
FA NOTIFICATION DEVICES	84"	BOTTOM	1
MOTOR STARTERS	78"	TOP	1, 2
RECEPTACLES - NORMAL AREAS	18"	CENTER	1
RECEPTACLES - EXTERIOR AREAS	18"	ed	1
SAFETY SWITCHES	78"	TOP	1, 2
VARIABLE FREQUENCY DRIVES	78"	TOP	1, 2

NOTES:

1. UNLESS NOTED OTHERWISE. WALL MOUNTING HEIGHTS INDICATED ON DRAWINGS OR DETAILS SHALL SUPERSEDE STANDARD WALL MOUNTING HEIGHTS LISTED HERE. COORDINATE ALL DEVICE LOCATIONS WITH OTHER TRADES PRIOR TO INSTALLATION. ADJUST TO MATCH MASONRY COURSES, IF APPLICABLE. MOUNT ALL BOXES TRUE AND PLUMB.

2. MOUNTING HEIGHT AS MEASURED TO TOP OF ENCLOSURE OR CENTER OF OPERATING HANDLE AT HIGHEST POSITION, WHICHEVER IS HIGHER. STACKING OF SAFETY SWITCHES, ENCLOSED CIRCUIT BREAKERS AND MOTOR STARTERS IS PERMITTED.

3. COORDINATE EXACT HEIGHT AND LOCATION WITH MECHANICAL CONTRACTOR.

POWER SYMBOLS

SYMBOL	DESCRIPTION
CEILING MTD / NORMAL WALL MTD / EMERGENCY / CRITICAL / STUB UP / FLOOR MTD	
	SIMPLEX OUTLETS — SUBSCRIPTS
	DUPLEX OUTLETS — "AC" = ABOVE COUNTER; "C" = SWITCH CONTROLLED PER ASHRAE 90.1/CAT24)
	QUADRUPLEX OUTLETS — "G" = GROUND FAULT BREAKER
	SPECIALTY OUTLETS (NEMA TYPE AS SHOWN) — "GF" = GROUND FAULT; "IG" = ISOLATED GROUND; "UC" = UNDER COUNTER; "USB" = W/ USB PORTS; "WP" = WEATHERPROOF BOX; "WR" = WEATHER RESISTANT
	CORD REEL
J	JUNCTION BOX — SUBSCRIPTS
FB#	COMBINATION AV, DATA & POWER BOX(SEE APPLICABLE SCHEDULE FOR SIZE, ETC.) — "P" = FURNITURE POWER CONNECTION; "T" = FURNITURE TELECOM CONNECTION
	PUSH BUTTON — SUBSCRIPTS
E	EQUIPMENT CONNECTION — "ADA" = ADA COMPLIANT DOOR OPERATOR
PT	POWER/TELECOM POLE — "EPO" = EMERGENCY POWER OFF
M	MOTOR — "DO" = DOOR OPERATOR; "HF" = HANDS FREE
$^M	MANUAL MOTOR STARTER, FRACTIONAL HORSEPOWER
	NON-FUSIBLE SAFETY SWITCH
	FUSIBLE SAFETY SWITCH
	COMBINATION MOTOR STARTER/SAFETY SWITCH, ENCLOSED CIRCUIT BREAKER
	VARIABLE FREQUENCY DRIVE (VFD) (FURNISHED BY DIV 23, INSTALLED BY DIV 26)
	DISCONNECT SWITCH (FURNISHED BY DIV 23, INSTALLED BY DIV 26)
	SURGE SUPPRESSOR
	GROUND BAR
	GROUND ROD — SUBSCRIPTS: "CR" = CHEMICAL ROD; "TW" = TEST WELL
	SURFACE MOUNTED PLUGMOLD OR WIREMOLD (DEVICE QUANTITIES AND TYPES AS INDICATED)
HH	POWER/TELECOMMUNICATIONS HANDHOLE
MH	POWER/TELECOMMUNICATIONS MANHOLE
POWER DISTRIBUTION	
	WALL MOUNTED PANEL (SHADING INDICATES 480/277)
	RECESSED PANEL (SHADING INDICATES 480/277)
SWBD1	ELECTRICAL EQUIPMENT/GEAR SIZE, TYPE, AND MOUNTING AS SHOWN AND/OR NOTED.
	UTILITY METER

FIRE ALARM SYMBOLS

SYMBOL (CEILING MOUNTED / WALL MOUNTED)	DESCRIPTION
BT / BR	SMOKE DETECTOR PHOTOELECTRIC, UNO. — SUBSCRIPTS: "BR" = BEAM RECEIVER; "BT" = BEAM TRANSMITTER; "ER" = ELEVATOR; "F" = FIXED TEMPERATURE; "IP" = COMBINATION I/P; "RF" = COMBINATION R/F; "IO" = IONIZATION; "SB" = SOUNDER BASE; "SC" = SECURITY COVER; "WG" = WIRE GUARD; "WP" = WEATHER PROOF
	COMBINATION SMOKE/GAS DETECTORS
	GAS DETECTOR, CARBON MONOXIDE, UNO.
	COMBINATION HEAT/GAS DETECTORS
	HEAT DETECTOR RATE OF RISE, UNO.
	FLAME DETECTOR
	WATER DETECTOR
	MULTI CRITERIA DETECTOR
	AUDIBLE — SUBSCRIPTS: "#cd" = CANDELA; "#dB" = DECIBEL RATING; "#W" = SPEAKER WATTAGE; "WG" = WEATHER GUARD; "WP" = WEATHER PROOF
	SPEAKER
	VISIBLE
	COMBINATION AUDIBLE/VISIBLE
	COMBINATION SPEAKER/VISIBLE
	MASS NOTIFICATION STROBE, AMBER UNO.
	COMBINATION MASS NOTIFICATION SPEAKER & STROBE, AMBER UNO.
ETN	EMERGENCY TEXTUAL NOTIFICATION DEVICE
	REMOTE ALARM INDICATOR — SUBSCRIPTS
F	FIRE ALARM BELL — "RTS" = REMOTE INDICATOR & TEST SWITCH; "RI" = REMOTE INDICATOR; "TS" = TEST SWITCH
DH	MAGNETIC DOOR HOLD OPEN DEVICE FLOOR MOUNTED UNO
XXX	ADDRESSABLE MODULE — TYPES
	DUCT MOUNTED DETECTOR PHOTOELECTRIC, UNO — "AIM" = ADDRESSABLE INPUT; "AOM" = ADDRESSABLE OUTPUT; "ISO" = ISOLATOR MODULE; "PIV" = POST INDICATOR VALVE; "PS" = PRESSURE SWITCH; "TM" = TEMPERATURE MONITOR; "VS" = VALVE/TAMPER SWITCH; "WF" = WATER FLOW
F	PULL STATION FIRE ALARM, UNO.
	FLOW SWITCH
	TAMPER SWITCH
FACP	FIRE ALARM PANEL SURFACE MOUNTED — DESIGNATIONS: "ASDP" = ASPIRATING SMOKE DETECTOR PANEL; "BATT" = BATTERY CABINET; "DACT" = DIGITAL ALARM COMMUNICATIONS TRANSMITTER; "FAA" = ANNUNCIATOR PANEL; "FACU" = CONTROL UNIT; "FATC" = TERMINAL CABINET; "NAC" = NOTIFICATION APPLIANCE CIRCUIT PANEL; "SECP" = SMOKE EVACUATION CONTROL PANEL
FACP	FIRE ALARM PANEL RECESSED

CIRCUIT SYMBOLS

WIRES	DESCRIPTION
LC-1-1	HOME RUN. NUMERALS INDICATE PANELBOARD AND CIRCUIT NUMBERS.
	HOME RUN. MULTIPLE ARROWS INDICATES NUMBER OF CIRCUITS INCLUDED IN CONDUIT (1, 2 OR 3).
	UNCONTROLLED CIRCUIT
	INDICATES CIRCUIT CONTINUATION
	STUB INTO ACCESSIBLE CORRIDOR CEILING SPACE UNO
	CAP END OF CONDUIT
	INDICATES CONDUIT RISER UP
	INDICATES CONDUIT RISER DOWN
	CONDUIT SLEEVE

STANDARD DETAILING SYMBOLS

- PLAN / DETAIL REF. — AREA TO BE ENLARGED — SIM — 1 / A-101 — SHEET REF. — CALLOUT
- SECTION REF. — SHEET REF. — SIM — 1 / A-101 — BUILDING / WALL SECTION
- VIEW NAME — VIEW DESIGNATION — VIEW TITLE — 1 View Name — SCALE: 1/8" = 1'-0" — VIEW SCALE — 1/A101 — VIEW REF/ SHEET REF WHERE VIEW IS REFERENCED.
- LEVEL NAME — FIRST FLOOR; LEVEL ELEVATION — 100' - 0"
- GRID NUMBER OR LETTER — A — GRID LINE
- INDICATES PLAN NORTH; INDICATES TRUE NORTH — NORTH INDICATOR
- ROOM NUMBER — Room 101 — ROOM TAG
- REVISION NUMBER — 1 — REVISION TAG; REVISION CLOUD
- PER SHEET KEYNOTE NUMBER — 1 — KEYNOTE TAG
- ELEVATION AT POINT INDICATED — 1' - 0" — SPOT ELEVATION SYMBOL
- CONNECT NEW TO EXISTING
- POINT OF DISCONNECTION
- LINE TYPE INDICATES BACKGROUND
- LINE TYPE INDICATES EXISTING
- LINE TYPE INDICATES DEMOLITION
- LINE TYPE INDICATES NEW
- LINE TYPE INDICATES HIDDEN/UNDER OBSTRUCTION

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JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS
CLAYTON MIDDLE SCHOOL
AHU 16 AND 17 REPLACEMENT
490 GUY RD,
CLAYTON, NC 27520
CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 041410 ENGINEER WILLIAM A. KEMP
3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY WK
CHECKED BY WK
DATE 3/31/2025

TITLE

ELECTRICAL SYMBOLS & ABBREVIATIONS

PROJECT NO. 50185618

E-001

SHEET NO.

GENERAL NOTES - ELECTRICAL

1. ELECTRICAL PLANS ARE GENERALLY DIAGRAMMATIC IN NATURE AND DO NOT CONVEY ALL DETAILS REQUIRED FOR A COMPLETE INSTALLATION. HOWEVER, THESE PLANS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE FOR GENERAL ARRANGEMENT AND LOCATION OF EQUIPMENT. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS, DIMENSIONS AND MOUNTING METHODS. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL VERIFY STRUCTURAL AND FINISH CONDITIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL ARRANGE WORK TO MEET THESE CONDITIONS AND PROVIDE SUCH EQUIPMENT AND ACCESSORIES AS MAY BE REQUIRED. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY FOUND WITHIN THE PLANS OR SPECIFICATIONS, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, MANUFACTURERS' RECOMMENDED INSTALLATION PROCEDURES, THE AMERICANS WITH DISABILITIES ACT, ANSI A117.1, THE NATIONAL ELECTRICAL CODE, THE NATIONAL FIRE ALARM AND SIGNALING CODE AND ALL OTHER APPLICABLE LOCAL AND STATE CODES AS ADOPTED AND MODIFIED BY THE AUTHORITIES HAVING JURISDICTION.
3. AN ELECTRICAL FOREMAN SHALL BE ON-SITE, SUPERVISING ALL WORK PERFORMED.
4. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ACCESS TO AREA OF WORK AND FOLLOW ALL OWNER ENVIRONMENTAL, HEALTH, SAFETY AND SECURITY PROTOCOLS.
5. ALL WORK SHALL BE PHASED IN ACCORDANCE WITH CONTRACT PLANS, SPECIFICATIONS AND OWNER'S REQUIREMENTS.
6. ALL MATERIALS AND EQUIPMENT FURNISHED FOR THIS PROJECT SHALL BE NEW AND SHALL BE LISTED AND LABELED BY A THIRD PARTY NATIONALLY RECOGNIZED TESTING LABORATORY AS REQUIRED AND PERMITTED BY AUTHORITIES HAVING JURISDICTION. WHERE MULTIPLE PIECES OF EQUIPMENT AND/OR COMPONENTS ARE INSTALLED IN A COMMON ENCLOSURE, THE ENTIRE ASSEMBLY SHALL BE LISTED AND LABELED AS AN ASSEMBLY. MODIFICATIONS OR ADDITIONS TO EXISTING EQUIPMENT SHALL MATCH EXISTING TO MAINTAIN ANY ASSEMBLY LISTING.
7. CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL FIRE AND/OR SMOKE RATED WALLS, BARRIERS, CEILINGS, FLOORS, PARTITIONS, AND ROOFS PRIOR TO AND DURING CONSTRUCTION.
8. CONTRACTOR SHALL PROVIDE NATIONALLY RECOGNIZED TESTING LABORATORY LISTED THROUGH-PENETRATION DRAFT, FIRE AND SMOKE STOP SYSTEMS FOR ALL NEW FIRE AND/OR SMOKE-RATED WALL, BARRIER, CEILING, FLOOR AND ROOF PENETRATIONS WITHIN THE AREA OF WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, NATIONALLY RECOGNIZED TESTING LABORATORY LISTED REQUIREMENTS AND APPLICABLE BUILDING CODES. PROVIDE PENETRATION ASSEMBLIES SUITABLE FOR PARTICULAR CONSTRUCTION.
9. CONTRACTOR SHALL MAINTAIN INTEGRITY OF VAPOR BARRIER AND INSULATION FOR ALL ELECTRICAL WORK AND DEVICES ON EXTERIOR AND PERIMETER WALLS.
10. CONTRACTOR SHALL COORDINATE ELECTRICAL WORK WITH ALL OTHER TRADES PRIOR TO COMMENCING WORK TO ENSURE ELECTRICAL WORK DOES NOT INTERFERE WITH OTHER TRADES. LINES AND SYSTEMS THAT REQUIRE SLOPE SHALL TAKE PRECEDENCE OVER ELECTRICAL WORK.
11. CONTRACTOR SHALL REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR LOCATIONS OF MECHANICAL AND PLUMBING EQUIPMENT. CONTRACTOR SHALL REFER TO DRAWINGS OF OTHER TRADES FOR LOCATIONS OF THEIR EQUIPMENT. CONTRACTOR SHALL COORDINATE AND VERIFY ELECTRICAL REQUIREMENTS WITH OTHER TRADES PRIOR TO COMMENCING WORK.
12. PRIOR TO EQUIPMENT INSTALLATION, CONTRACTOR SHALL CONDUCT FIELD MEASUREMENTS TO ENSURE ALL ELECTRICAL EQUIPMENT AND ACCESSORIES WILL FIT INTO LOCATION(S) AS INDICATED ON PLANS. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL PROVIDE A PROPOSED SKETCH OF REVISED ARRANGEMENT TO ENGINEER OF RECORD FOR ACCEPTANCE PRIOR TO COMMENCING WORK.
13. PROPERLY SUPPORT ALL WORK AND EQUIPMENT INSTALLED UNDER THIS CONTRACT PLUMB AND PARALLEL WITH BUILDING LINES. STUDY ALL GENERAL, STRUCTURAL, PLUMBING, HVAC, AND ELECTRICAL DRAWINGS, SHOP DRAWINGS, AND CATALOG DATA TO DETERMINE HOW EQUIPMENT, ACCESSORIES, PIPING, FIXTURES, AND RELATED ITEMS ARE TO BE SUPPORTED, MOUNTED, OR SUSPENDED. PROVIDE ALL BOLTS, INSERTS, PIPE STANDS, BRACKETS, STRUCTURAL SUPPORTS, AND ACCESSORIES FOR PROPER SUPPORT OF EQUIPMENT FURNISHED UNDER THIS CONTRACT.
14. CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT FOR DEVICE BACK BOXES, EQUIPMENT, LUMINAIRES AND RACEWAY WHERE BUILDING CONSTRUCTION IS NOT SUITABLE FOR DIRECT MOUNTING.
15. CONTRACTOR SHALL VERIFY CEILING SYSTEMS AND PROVIDE MOUNTING ACCESSORIES, TRIMS AND ALL REQUIRED MOUNTING HARDWARE TO SUIT THE PARTICULAR INSTALLATION.
16. CONTRACTOR SHALL NOT BACKFILL EXCAVATIONS, INSTALL COVERPLATES AND ENCLOSURES OR GENERALLY SEAL OR OBSCURE ELECTRICAL INSTALLATIONS PRIOR TO INSPECTION AND ACCEPTANCE BY AUTHORITIES HAVING JURISDICTION.
17. CONTRACTOR SHALL REMOVE ALL DIRT AND DEBRIS FROM ALL ELECTRICAL ENCLOSURES AND DEVICE, JUNCTION AND PULL BOXES PRIOR TO INSTALLATION OF DEVICES, COVERPLATES AND LIDS.
18. CONTRACTOR SHALL LABEL ALL COVERPLATES, EQUIPMENT, JUNCTION BOXES, AND PULL BOXES WITH CIRCUIT AND PANEL DESIGNATIONS. REFER TO DETAILS AND SPECIFICATIONS FOR SPECIFIC LABEL AND IDENTIFICATION REQUIREMENTS.
19. CONTRACTOR SHALL PROVIDE NEW, TWO COLUMN, TYPED, COMPLETED AND REMOVABLE DIRECTORIES INDICATING CIRCUIT DESCRIPTIONS AND ROOM NUMBERS (AS INDICATED BY FINAL ROOM SIGNAGE), FOR ALL AFFECTED CIRCUITS WITHIN ELECTRICAL DISTRIBUTION EQUIPMENT. ALL SPACES SHALL BE INDICATED AS SUCH. ALL SPARES SHALL BE INDICATED AS SUCH AND PLACED IN THE "OFF" POSITION.
20. MINIMUM RACEWAY SIZE OF 3/4", UNLESS NOTED OTHERWISE.
21. ALL RACEWAYS SHALL BE INSTALLED CONCEALED ABOVE CEILINGS, WITHIN WALLS OR BELOW FLOORS EXCEPT WITHIN UNFINISHED SPACES AND ON CEILINGS OF AREAS WITH EXPOSED STRUCTURE. WITHIN PUBLIC SPACES, EXPOSED CONDUIT SHALL BE FACTORY OR FIELD PAINTED TO MATCH ADJACENT STRUCTURE. ALL CONDUITS SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURE. ALL CONDUITS ROUTED IN PARALLEL SHALL UTILIZE CONCENTRIC BEND RADII FOR ALL TURNS.
22. ALL EMPTY RACEWAYS SHALL BE PROVIDED WITH PULL STRINGS INSTALLED PER SPECIFICATIONS.
23. ALL EXPOSED RACEWAY ENDS SHALL BE PROVIDED WITH PLASTIC BUSHINGS.

GENERAL NOTES - ELECTRICAL

24. ALL ELECTRICAL CONDUCTORS, EQUIPMENT AND TERMINALS SHALL BE 75°C RATED UNLESS NOTED OTHERWISE.
25. MINIMUM CONDUCTOR SIZE OF #12AWG, COPPER, THHN/THWN, FOR BRANCH CIRCUITS, UNLESS NOTED OTHERWISE.
26. ALL BRANCH AND FEEDER CIRCUITS SHALL ORIGINATE FROM PANELS AND SERVE DEVICES AND EQUIPMENT AS INDICATED ON PLANS AND SCHEDULES. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK.
27. ALL BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR, UNLESS NOTED OTHERWISE. THE USE OF A COMMON NEUTRAL FOR MULTIPLE BRANCH CIRCUITS IS STRICTLY PROHIBITED.
28. ALL RACEWAYS CONTAINING A FEEDER OR BRANCH CIRCUIT SHALL BE PROVIDED WITH AN INSULATED EQUIPMENT GROUNDING CONDUCTOR. FOR RACEWAYS CONTAINING MORE THAN ONE BRANCH CIRCUIT, SIZE OF EQUIPMENT GROUNDING CONDUCTOR SHALL BE BASED ON THE LARGEST CIRCUIT'S OVERCURRENT PROTECTIVE DEVICE.
29. ALL DEVICE BACK BOXES SHALL BE RECESSED WITHIN WALLS, FURRING, OR CASEWORK, UNLESS NOTED OTHERWISE. USE OF EXPOSED SURFACE MOUNTED DEVICE BACK BOXES IS PROHIBITED EXCEPT WITHIN UNFINISHED SPACES AND ON CEILINGS OF AREAS WITH EXPOSED STRUCTURE. WITHIN PUBLIC SPACES, EXPOSED DEVICE BACK BOXES SHALL BE FACTORY OR FIELD PAINTED TO MATCH ADJACENT STRUCTURE.
30. DEVICE BACK BOXES INDICATED ON PLANS AS ADJACENT TO ONE ANOTHER SHALL BE MOUNTED 8" APART, CENTER-TO-CENTER, UNLESS NOTED OTHERWISE.
31. DEVICE BACK BOXES LOCATED ON OPPOSITE SIDES OF FIRE OR SMOKE RATED PARTITIONS SHALL NOT BE MOUNTED WITHIN THE SAME WALL CAVITY. WALL PENETRATIONS SHALL BE SEPARATED BY MOUNTING BOXES ON OPPOSITE SIDES OF WALL STUDS OR OTHER VERTICAL STRUCTURAL MEMBER INSIDE THE WALL.
32. CONTRACTOR SHALL COORDINATE EXACT HEIGHT AND LOCATION OF ALL WALL MOUNTED DEVICE BACK BOXES WITH ARCHITECTURAL INTERIOR ELEVATIONS AND CASEWORK SHOP DRAWINGS PRIOR TO INSTALLATION. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ARCHITECT AND ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK. MINOR ADJUSTMENTS IN ANY DIRECTION FOR DEVICE LOCATION, I.E. 5'-0" OR LESS, SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
33. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL DEVICE BACK BOX AND EQUIPMENT LOCATIONS WITH OTHER TRADES PRIOR TO INSTALLATION. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK. MINOR ADJUSTMENTS IN ANY DIRECTION FOR DEVICE LOCATION, I.E. 5'-0" OR LESS, SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
34. CONTRACTOR SHALL PROVIDE MINIMUM 4" HOUSEKEEPING PAD WITH CHAMFERED EDGES FOR ALL FLOOR MOUNTED EQUIPMENT, UNLESS NOTED OTHERWISE. REFER TO DETAILS, IF APPLICABLE.
35. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR THE EXACT LOCATION OF ALL CEILING MOUNTED LUMINAIRES AND DEVICES.
36. EXACT HEIGHTS AND LOCATIONS OF LUMINAIRES WITHIN UNFINISHED SPACES SHALL BE COORDINATED AND DETERMINED IN THE FIELD. LUMINAIRES SHALL NOT BE SUPPORTED FROM DUCTWORK OR PIPING. CHAIN OR TRAPEZE-TYPE HANGERS SHALL BE PROVIDED WHERE LUMINAIRES CAN NOT BE MOUNTED DIRECTLY TO STRUCTURE OR CEILING. LUMINAIRES SHALL BE LOCATED TO MAXIMIZE ACCESSIBILITY AND ILLUMINATION.
37. ORIENT VERTICALLY MOUNTED RECEPTACLES WITH GROUND PIN UP. ORIENT HORIZONTALLY MOUNTED RECEPTACLES WITH GROUND PIN TO LEFT (NEUTRAL UP).
38. ALL AV, DATA, SECURITY AND TELECOMMUNICATIONS CABLING SHALL BE INSTALLED CONCEALED FROM VIEW ABOVE CEILINGS, IN WALLS OR BELOW FLOORS EXCEPT WITHIN UNFINISHED SPACES AND ON CEILINGS OF AREAS WITH EXPOSED STRUCTURE. ALL CABLING SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURE.
39. SMOKE DETECTORS SHALL BE LOCATED MINIMUM 3'-0" FROM HVAC SUPPLY AND RETURN OPENINGS.
40. WHERE MULTIPLE VISUAL NOTIFICATION DEVICES CAN BE SEEN FROM A SINGLE LOCATION DURING NORMAL FACILITY OPERATION, ALL STROBES SHALL BE SYNCHRONIZED TO ALLOW FOR SIMULTANEOUS OPERATION.
41. NOT ALL ELECTRICAL DEVICES AND EQUIPMENT ARE SHOWN. LOCATIONS AND ASSOCIATED CIRCUITS OF EXISTING DEVICES AND EQUIPMENT SHOWN ARE BASED IN PART UPON PREVIOUS DRAWINGS, FIELD OBSERVATIONS AND INFORMATION FURNISHED BY OTHERS AND SHALL BE CONSIDERED APPROXIMATE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
42. ALL EXISTING DEVICES AND EQUIPMENT SHALL REMAIN IN PLACE AND OPERATIONAL UNLESS NOTED OTHERWISE.
43. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUITY OF ALL EXISTING CIRCUITS AND SYSTEMS TO REMAINING DEVICES AND EQUIPMENT WHICH MAY BE AFFECTED BY AREA OF WORK. MATCH AND EXTEND CONDUIT, CONDUCTORS, CABLES, ETC. AS NECESSARY TO MAINTAIN CIRCUIT INTEGRITY.
44. ALL EXISTING RACEWAY AND WIRING THAT ARE TO REMAIN IN THE AREA OF WORK SHALL BE RELOCATED AS REQUIRED TO PROVIDE OR MAINTAIN ACCESSIBILITY AND TO ACCOMMODATE THE PROPOSED CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY ALL RACEWAY AND WIRING TO REMAIN PRIOR TO COMMENCING WORK. ALL RELOCATION SHALL BE COORDINATED WITH THE OWNER OR OWNER'S REPRESENTATIVE. PROVIDE TEMPORARY CONNECTIONS TO EQUIPMENT AND DEVICES TO MAINTAIN EQUIPMENT AND SYSTEMS IN SERVICE. ALL DOWNTIME REQUIRED FOR INSTALLATION OF TEMPORARY CONNECTIONS SHALL BE COORDINATED WITH THE OWNER OR OWNER'S REPRESENTATIVE.
45. IN AREAS WHERE EXISTING CEILINGS ARE NOT SLATED TO BE REPLACED, CONTRACTOR SHALL WORK THROUGH EXISTING CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR AREA OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING AND REPLACING CEILING SYSTEM DAMAGED AS A RESULT OF THEIR WORK.
46. CONTRACTOR SHALL COORDINATE POWER SHUTDOWN REQUIREMENTS WITH OWNER OR OWNER'S REPRESENTATIVE AT LEAST 72 HOURS IN ADVANCE OF DEMOLITION AND/OR TIE-IN WORK. SHUTDOWN WORK SHALL BE MINIMIZED TO AVOID INTERFERENCE WITH OWNER'S NORMAL OPERATING SCHEDULE.

DEMOLITION NOTES - ELECTRICAL

1. DEMOLITION WORK SHOWN BOLD AND DASHED. EXISTING TO REMAIN WORK SHOWN LIGHT AND CONTINUOUS.
2. UNLESS NOTED OTHERWISE, DEMOLISH ALL POWER DEVICES, FIRE ALARM DEVICES, LOW VOLTAGE DEVICES AND LIGHT FIXTURES SCHEDULED FOR DEMOLITION. FOR ALL DEMOLISHED DEVICES AND FIXTURES, COMPLETELY REMOVE ALL BRANCH CIRCUITS AND ASSOCIATED WIRING, CONDUIT AND ACCESSORIES. WHERE COMPLETE DEMOLITION IS NOT POSSIBLE, CONTRACTOR SHALL INFORM THE ARCHITECT AND OWNER AND DEMOLISH ITEMS SUCH THAT IT DOES NOT DISTURB EXISTING ARCHITECTURAL ELEMENTS.
3. CONTRACTOR SHALL PROTECT, PRESERVE AND MAINTAIN ANY DEVICES TO BE REUSED OR RELOCATED AND SHALL REINSTALL WHERE INDICATED ON PLANS.
4. EXCEPT WHERE NOTED OTHERWISE, ALL REMOVED ELECTRICAL EQUIPMENT, DEVICES, CONDUIT, CONDUCTORS, BOXES, LUMINAIRES AND ASSOCIATED ITEMS SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS.
5. CONTRACTOR SHALL DISCONNECT AND REMOVE ALL ELECTRICAL CONNECTIONS TO EQUIPMENT FROM OTHER TRADES BEING REMOVED WITHIN AREA OF WORK. COORDINATE WITH OTHER TRADE CONTRACTORS PRIOR TO DEMOLITION.
6. PRIOR TO REMOVAL OF CIRCUIT FROM A PANEL, CONTRACTOR SHALL VERIFY NO OTHER DEVICES EXIST ON THE CIRCUIT. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO REMOVAL.
7. ONCE A CIRCUIT HAS BEEN REMOVED, THE REMAINING BREAKER SHALL BE LABELED SPARE, TURNED OFF, AND MADE READY FOR USE UNDER NEW WORK.
8. CONTRACTOR SHALL COORDINATE FIRE ALARM SYSTEM DOWNTIME REQUIREMENTS WITH AUTHORITY HAVING JURISDICTION AND OWNER'S REPRESENTATIVE AT LEAST 72 HOURS IN ADVANCE OF DEMOLITION WORK. DOWNTIME WORK SHALL BE MINIMIZED TO AVOID INTERFERENCE WITH OWNER'S NORMAL OPERATING SCHEDULE. FIRE WATCH SHALL BE PROVIDED DURING FIRE ALARM SYSTEM DOWNTIME. NOTIFY AUTHORITY HAVING JURISDICTION FOR ANY INTERRUPTION EXTENDING BEYOND EIGHT HOURS.
9. PRIOR TO REMOVAL OF INITIATING DEVICE CIRCUIT, SIGNALING LINE CIRCUIT OR NOTIFICATION APPLIANCE CIRCUIT FROM FIRE ALARM CONTROL PANEL, CONTRACTOR SHALL VERIFY NO OTHER DEVICES EXIST ON THE CIRCUIT. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO REMOVAL.
10. ONCE A FIRE ALARM CIRCUIT HAS BEEN REMOVED, THE REMAINING INITIATING DEVICE CIRCUIT, SIGNALING LINE CIRCUIT OR NOTIFICATION APPLIANCE CIRCUIT MODULE SHALL BE LABELED SPARE AND MADE READY FOR USE UNDER NEW WORK.

RENOVATION NOTES - ELECTRICAL

1. NEW WORK SHOWN BOLD AND CONTINUOUS. EXISTING TO REMAIN WORK SHOWN LIGHT AND CONTINUOUS.
2. CONTRACTOR SHALL VERIFY NO DEVICES OR EQUIPMENT ARE SERVED BY BREAKERS CURRENTLY LABELED "SPARE" TO BE UTILIZED FOR NEW WORK WITHIN AFFECTED ELECTRICAL DISTRIBUTION EQUIPMENT. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL TRACE AND IDENTIFY SUSPECT LOAD(S) AND PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK.
3. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY FIRE ALARM SYSTEM TYPE. IF DETERMINED THAT THE EXISTING SYSTEM IS A CONVENTIONAL-ZONED OR HYBRID TYPE, OR IF THE EXISTING SYSTEM IS DISPLAYING A TROUBLE OR SUPERVISORY SIGNAL, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD PRIOR TO COMMENCING WORK.
4. CONTRACTOR SHALL COORDINATE FIRE ALARM SYSTEM DOWNTIME REQUIREMENTS WITH AUTHORITY HAVING JURISDICTION AND OWNER'S REPRESENTATIVE AT LEAST 72 HOURS IN ADVANCE OF TIE-IN WORK. DOWNTIME WORK SHALL BE MINIMIZED TO AVOID INTERFERENCE WITH OWNER'S NORMAL OPERATING SCHEDULE. FIRE WATCH SHALL BE PROVIDED DURING FIRE ALARM SYSTEM DOWNTIME. NOTIFY AUTHORITY HAVING JURISDICTION FOR ANY INTERRUPTION EXTENDING BEYOND EIGHT HOURS.
5. NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH AND CONNECTED TO EXISTING FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE ALL NECESSARY COMPONENTS TO MAKE NEW FIRE ALARM SYSTEM FULLY FUNCTIONAL. CONTRACTOR SHALL VERIFY EXISTING FIRE ALARM SYSTEM HAS AVAILABLE CAPACITY FOR NEW DEVICES. IF CAPACITY IS NOT AVAILABLE, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD PRIOR TO COMMENCING WORK.
6. FIRE ALARM CIRCUITS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF NEC ARTICLE 760. CONTRACTOR SHALL PROVIDE NEW RACEWAY AND BOXES TO CONNECT NEW FIRE ALARM DEVICES TO EXISTING INITIATING DEVICE CIRCUITS, SIGNALING LINE CIRCUITS OR NOTIFICATION APPLIANCE CIRCUITS. PROVIDE UPSTREAM AND DOWNSTREAM CONDUCTORS AND RACEWAYS AS REQUIRED TO MAINTAIN EXISTING WIRING CLASSIFICATION AND SERVICE TO EXISTING DEVICES NOT ASSOCIATED WITH THIS PROJECT. CABLE SPLICES ARE STRICTLY PROHIBITED, UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL SUBMIT UPDATED FIRE ALARM BATTERY CALCULATIONS AND PROVIDE ANY ADDITIONAL POWER SUPPLIES, BATTERIES, NAC PANELS OR COMPONENTS REQUIRED TO ACCOMPLISH CHANGES SHOWN ON DRAWINGS OR SPECIFICATIONS.
8. CONTRACTOR SHALL COMPLY WITH REACCEPTANCE TESTING AS ESTABLISHED WITHIN THE NATIONAL FIRE ALARM AND SIGNALING CODE, SECTION 14.4.2, AS ADOPTED AND AMENDED BY THE AUTHORITY HAVING JURISDICTION. IF APPLICABLE, EXISTING FIRE ALARM PANEL SHALL BE (RE)TESTED FOR INTERCONNECTIONS TO ELEVATOR SYSTEM PRIOR TO FINAL INSPECTION BY THE AUTHORITY HAVING JURISDICTION.
9. CONTRACTOR SHALL UPDATE ZONE MAPS. ZONE MAPS SHALL INCLUDE LOCATIONS OF ALL INITIATING DEVICES, REMOTE ANNUNCIATORS AND THE FIRE ALARM CONTROL PANEL. ROOM NUMBERS SHALL REFLECT FINAL ROOM SIGNAGE.

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JOHNSTON COUNTY PUBLIC SCHOOLS

JCPS
CLAYTON MIDDLE SCHOOL
AHU 16 AND 17 REPLACEMENT
490 GUY RD,
CLAYTON, NC 27520
CONSTRUCTION DOCUMENTS

SEAL

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

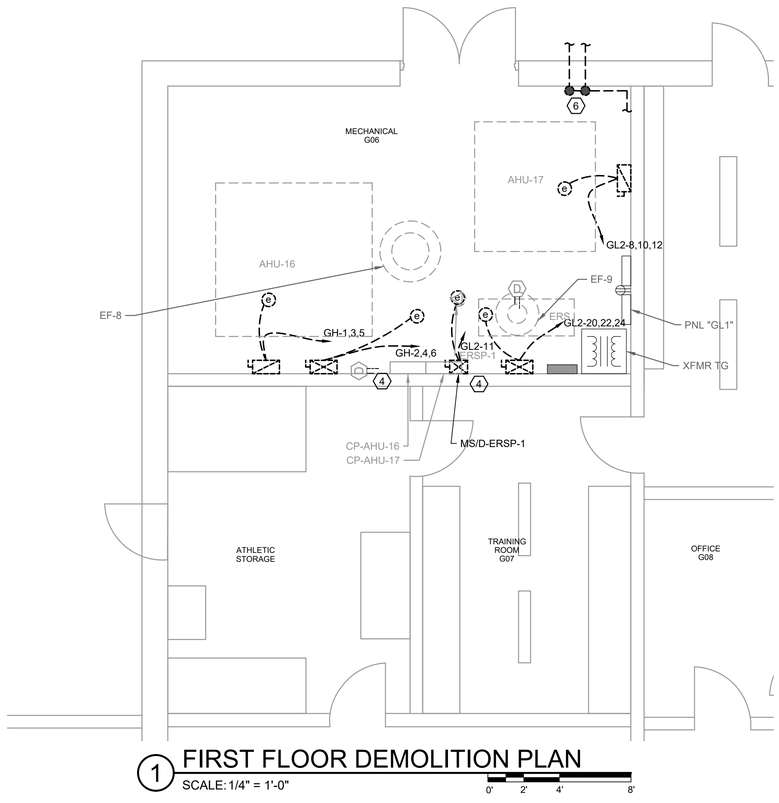
DRAWN BY SF
APPROVED BY WK
CHECKED BY WK
DATE 3/31/2025

TITLE
ELECTRICAL NOTES

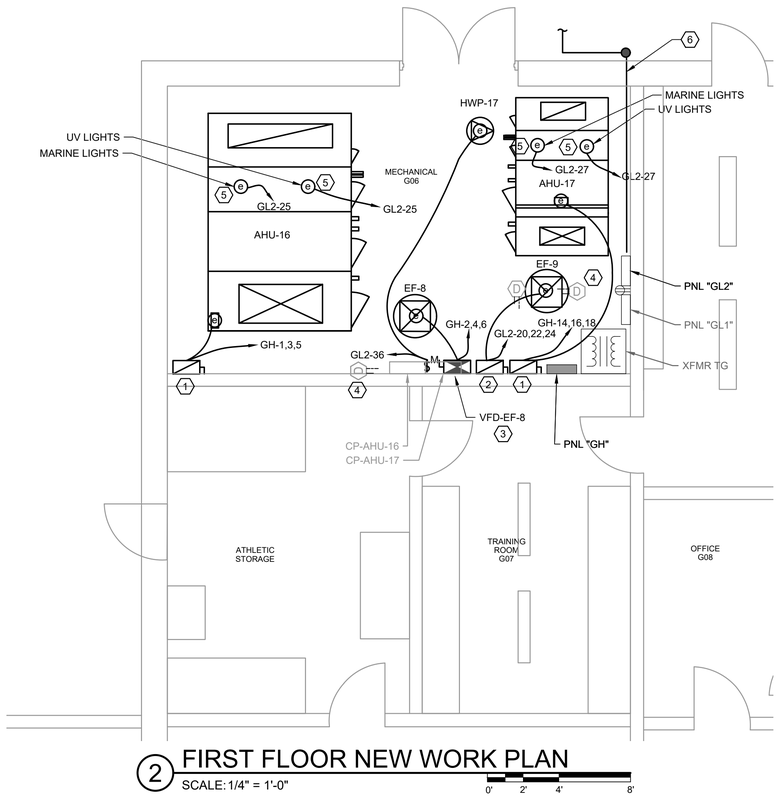
PROJECT NO. 50185618

E-002

SHEET NO.



1 FIRST FLOOR DEMOLITION PLAN
SCALE: 1/4" = 1'-0"
0' 2' 4' 8'



2 FIRST FLOOR NEW WORK PLAN
SCALE: 1/4" = 1'-0"
0' 2' 4' 8'

GENERAL NOTES:

1. CIRCUITS TO BE DEMOLISHED SHALL BE DEMOLISHED BACK TO SOURCE. THE CIRCUIT BREAKER IS EXISTING TO REMAIN.

(#) KEYNOTES:

1. PROVIDE NEW 480V, 3-P, 30A FUSIBLE DISCONNECT SWITCH FUSED AT 20A.
2. PROVIDE NEW 208V, 3-P, 30A FUSIBLE DISCONNECT SWITCH FUSED AT 20A.
3. DIV 26 CONTRACTOR TO INSTALL NEW VFD FURNISHED BY DIV 23 CONTRACTOR. PROVIDE 3#12, #12G IN 3/4"C FROM SOURCE PANEL TO VFD CONTINUING CONDUCTORS TO MECHANICAL EQUIPMENT.
4. EXISTING DUCT DETECTOR TO BE REMOVED DURING DEMOLITION, STORED, AND REINSTALLED IN NEW DUCTWORK. EXISTING FIRE ALARM PANEL SHOULD BE MODIFIED AS NECESSARY DURING CONSTRUCTION TO ALLOW FOR THESE DETECTORS TO BE REMOVED WITHOUT SHUTTING DOWN THE FIRE ALARM SYSTEM MONITORING THE FACILITY. EXISTING EXISTING SLC LOOP WIRING AS NECESSARY TO FACILITATE REINSTALLATION OF EXISTING DUCT DETECTORS.
5. PROVIDE 2#12, #12G IN 3/4"C TO SERVE UV LIGHTS AND MARINE LIGHTS INSIDE THE AHU. EACH SECTION OF THE AHU IS SHIPPED SEPARATELY WITH SEPARATE CONNECTIONS FOR EACH. PROVIDE WIRING AND CONDUIT AS NECESSARY TO EXTEND CIRCUIT TO SERVE CORRESPONDING SECTIONS.
6. RELOCATE (2) 1" CONDUIT TO AVOID OBSTRUCTION OF JUNCTION BOX WITH NEW AIR HANDLING UNIT INSTALLATION.EXTEND AND REPLACE WIRING FOR CONDUIT RELOCATION. SEAL EXTERIOR WALL PENETRATIONS.

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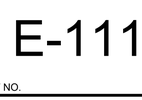
SEAL



3/31/2025

KEY PLAN

FIRST FLOOR	NTS

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY WK
CHECKED BY WK
DATE 3/31/2025

TITLE
ELECTRICAL DEMOLITION & NEW WORK PLANS

PROJECT NO. 50185618

E-111

SHEET NO.

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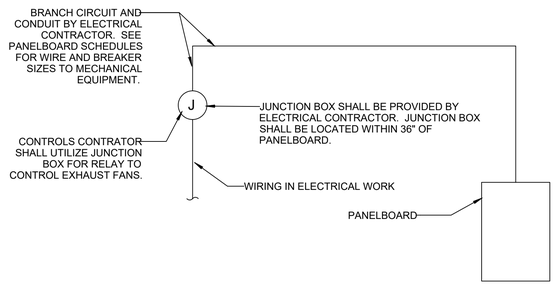
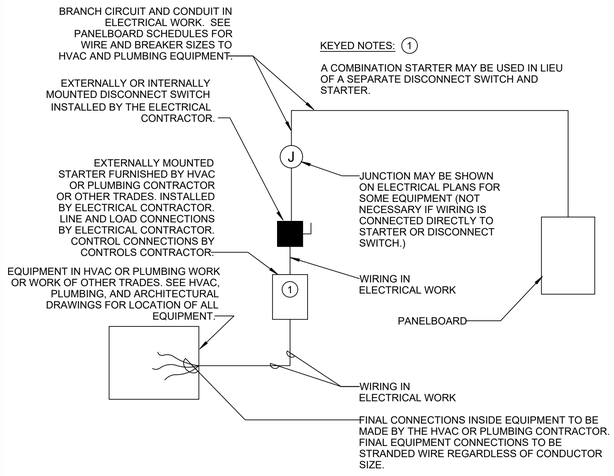
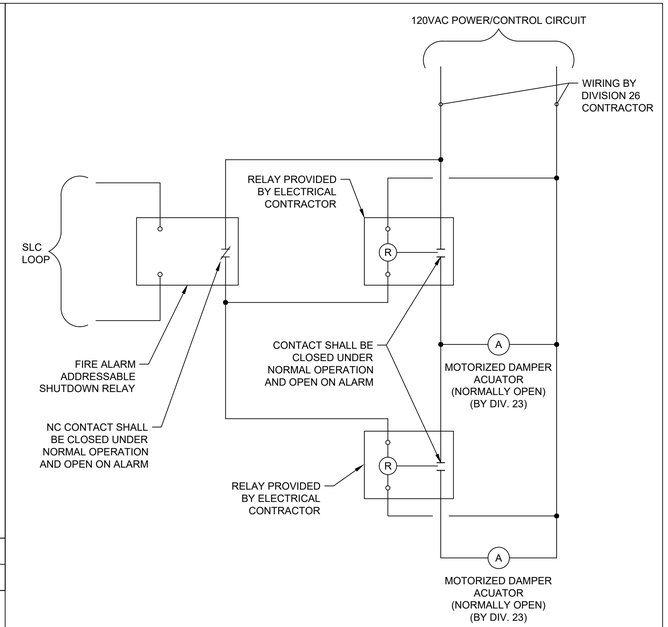


1 TYPICAL EXHAUST FAN COORDINATION DETAIL — SCALE: N.T.S.



2 ELECTRICAL CONNECTIONS FOR MECHANICAL AND PLUMBING EQUIPMENT — SCALE: NTS — E102-03



3 FIRE ALARM SMOKE DAMPER SHUTDOWN RELAY. 120VAC CONTROL — SCALE: NTS

4 FIRE ALARM AHU SHUT DOWN — SCALE: NTS — E062-06

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CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 049410 ENGINEER WILLIAM A. KEMP
William A. Kemp
C6F0A4A4B1D484...
3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY WK
CHECKED BY WK
DATE 3/31/2025

TITLE
DETAILS

PROJECT NO. 50185618

E-501

SHEET NO.

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EXISTING PANEL GH — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	CIRCUIT BREAKER FUNCTION	CIRCUIT BREAKER TRIP	PHASE A	PHASE B	PHASE C	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER FUNCTION	CIRCUIT BREAKER NOTE	DESCRIPTION	LOAD VA	CKT
1	3880					5986							2106	2
3	3880	**AHU 16**			40		5986		20		1	**EF-8**	2106	4
5	3880	**3#8, #10G IN 3/4"C**	1					5986				**3#12,#12G IN 3/4"C**	2106	6
7	0	LIGHTS G09, G08, G08B. G10	1		20	0							0	8
9	0	LIGHTS G11, G12, G14, G15, G15A	1		20		0		15		1	UNIT HEATER #1	0	10
11	0	LIGHTS G02, G13	1		20			0					0	12
13	0	LIGHTS G36, G04, G05, G07	1		20	831						**AHU-17**	831	14
15	0	LIGHTS G16, G34, G35	1		20		831		20		2	**3#12, #12G IN 3/4"C**	831	16
17	0	LIGHTS GG06 GYM	1		20			831					831	18
19	0	LIGHTS G03 GYM	1		20	0						SPACE	0	20
21	0	LGITHS G03 GYM	1		20		0					SPACE	0	22
23	0	LIGHTS G03 GYM	1		20			0				SPACE	0	24
25	0	LIGHTS G03 GYM	1		20	0						SPACE	0	26
27	0	LIGHTS G03 GYM (OFF)	1		20		0					SPACE	0	28
29	0	UNKNOWN LOAD	1		20			0	10			SPACE	0	30
31	0	POLE LIGHTS	1		20	0						SPARE	0	32
33	0	SPACE					0					SPACE	0	34
35	0	SPACE						0				SPACE	0	36
37	0	SPACE				175								38
39	0	SPACE					0				1	TRANSFORMER TG	175	40
41	0	SPACE						0						42

LOAD TYPE	CONNECTED		DEMAND
EXISTING	0	125%	0
RECEPTACLES	0	100%	0
MOTOR	0	100%	0
LARGEST MOTOR	0	125%	0
HVAC	0	100%	0
LIGHTING	0	125%	0
KITCHEN	0	100%	0
OTHER	0	100%	0
TOTAL	0	100%	0

480Y/277	V
3	PHASE
4	WIRE
42	KAIC
N/A	SE LABEL
400A	BUS RATING
MLO	MAINS TYPE
N/A	MCB RATING
-	TRIP UNIT

FED FROM: PANEL GH
MOUNT: SURFACE
NEMA: 1
MAN / MODEL #

NOTES:
1. EXISTING CB. TO REMAIN
2. PROVIDE NEW CB EX. IN SPACE
3.
4.

FUNCTIONS AND ABBREVIATIONS

AFCB: ARC FAULT CB	SFCB: SUBFEED CB	L: LONG TIME
CB: CIRCUIT BREAKER	SFL: SUBFEED LUGS	S: SHORT TIME
EX: EXISTING	SR: SEE RISER	I: INSTANTANEOUS
GFEP: GND FAULT CB (30ma/100mA)	ST: SHUNT TRIP	G: GROUND FAULT
GFCB: GND FAULT CB (6mA)	UV: UNDERVOLTAGE TRIP	A: ALARM
ARMS: ARC FLASH REDUCTION MAINTENANCE SWITCH		

PANEL DEMAND TOTALS

PH. A	0	VA	0.0	AMP
PH. B	0	VA	0.0	AMP
PH. C	0	VA	0.0	AMP

EXISTING PANEL GL2 — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	CIRCUIT BREAKER FUNCTION	CIRCUIT BREAKER TRIP	PHASE A	PHASE B	PHASE C	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER FUNCTION	CIRCUIT BREAKER NOTE	DESCRIPTION	LOAD VA	CKT
1	0	WATER COOLER G09, G14	1		20	0			20		1	RECEPTACLE G08	0	2
3	0	GFI RECEPTACLE G09, G14	1		20		0		20		1	RECEPTACLE G07, G09	0	4
5	0	LIGHTING TRANSFORMER	1		20			0	20		1	RECEPTACLE G05, G04, G08A, G36	0	6
7	0	RECEPTACLE G10, G14, G11, G12	1		20	0							0	8
9	0	RECEPTACLE G15, G15	1		20		0		20		1	**SPARE**	0	10
11	0	SPARE PUMP	1		20			0					0	12
13	0	SPARE	1		20	0							0	14
15	0	MECHANICAL CONTROLS	1		20		0		20		1	SPARE	0	16
17	0	MECHANICAL CONTROLS	1		20			0					0	18
19	0					552							552	20
21	0	SPARE	1		20		552		20		1	**EF-9**	552	22
23	0							552				**3#12, #12G IN 3/4" C**	552	24
25	1000	**AHU-16 UV LIGHTS AND MARINE LIGHTS**	1		20	1000			100		1	SUB PANEL SCORE BOARD	0	26
27	1000	**AHU-17 UV LIGHTS AND MARINE LIGHTS**	1		20		1000						0	28
29	0	RECEPTACLE G13	1		20			0	90		1	CONCESSION	0	30
31	0	SPARE	1		20	0						STAND	0	32
33	0	RECEPTACLE G06	1		20		0		15		1	SPACE	0	34
35	0	RECEPTACLE G08, G15	1		20			1176	20		2	**HWP-17**	1176	36
37	0	SPARE	1		20	0			20		1	SPACE	0	38
39	0	SPARE	1		20		0		20		1	SPACE	0	40
41	0	SPARE	1		20			0			1	SPACE	0	42

LOAD TYPE	CONNECTED		DEMAND
EXISTING	0	125%	0
RECEPTACLES	0	100%	0
MOTOR	0	100%	0
LARGEST MOTOR	0	125%	0
HVAC	0	100%	0
LIGHTING	0	125%	0
KITCHEN	0	100%	0
OTHER	0	100%	0
TOTAL	0	100%	0

208Y/120	V
3	PHASE
4	WIRE
42	KAIC
N/A	SE LABEL
225A	BUS RATING
MCB	MAINS TYPE
225A	MCB RATING
-	TRIP UNIT

FED FROM: PANEL GL2
MOUNT: SURFACE
NEMA: 1
MAN / MODEL #

NOTES:
1. EXISTING CB. TO REMAIN
2. PROVIDE NEW CB EX. IN SPACE
3.
4.

FUNCTIONS AND ABBREVIATIONS

AFCB: ARC FAULT CB	SFCB: SUBFEED CB	L: LONG TIME
CB: CIRCUIT BREAKER	SFL: SUBFEED LUGS	S: SHORT TIME
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GFCB: GND FAULT CB (6mA)	UV: UNDERVOLTAGE TRIP	A: ALARM
ARMS: ARC FLASH REDUCTION MAINTENANCE SWITCH		

PANEL DEMAND TOTALS

PH. A	0	VA	0.0	AMP
PH. B	0	VA	0.0	AMP
PH. C	0	VA	0.0	AMP

GENERAL NOTES:

1. CIRCUITS TO BE DEMOLISHED SHALL BE DEMOLISHED BACK TO SOURCE. THE CIRCUIT BREAKER IS EXISTING TO REMAIN.

KEYNOTES:

1. DEMOLISH EXISTING CONDUCTORS SERVING AHU-17 BACK TO SOURCE. CIRCUIT BREAKER TO REMAIN. EXISTING CIRCUIT BREAKER LABELED 'AHU-17' TO BE RELABELED 'SPARE'.

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JOHNSTON COUNTY PUBLIC SCHOOLS

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AHU 16 AND 17 REPLACEMENT
490 GUY RD,
CLAYTON, NC 27520
CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047410 William A. Kemp II
3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

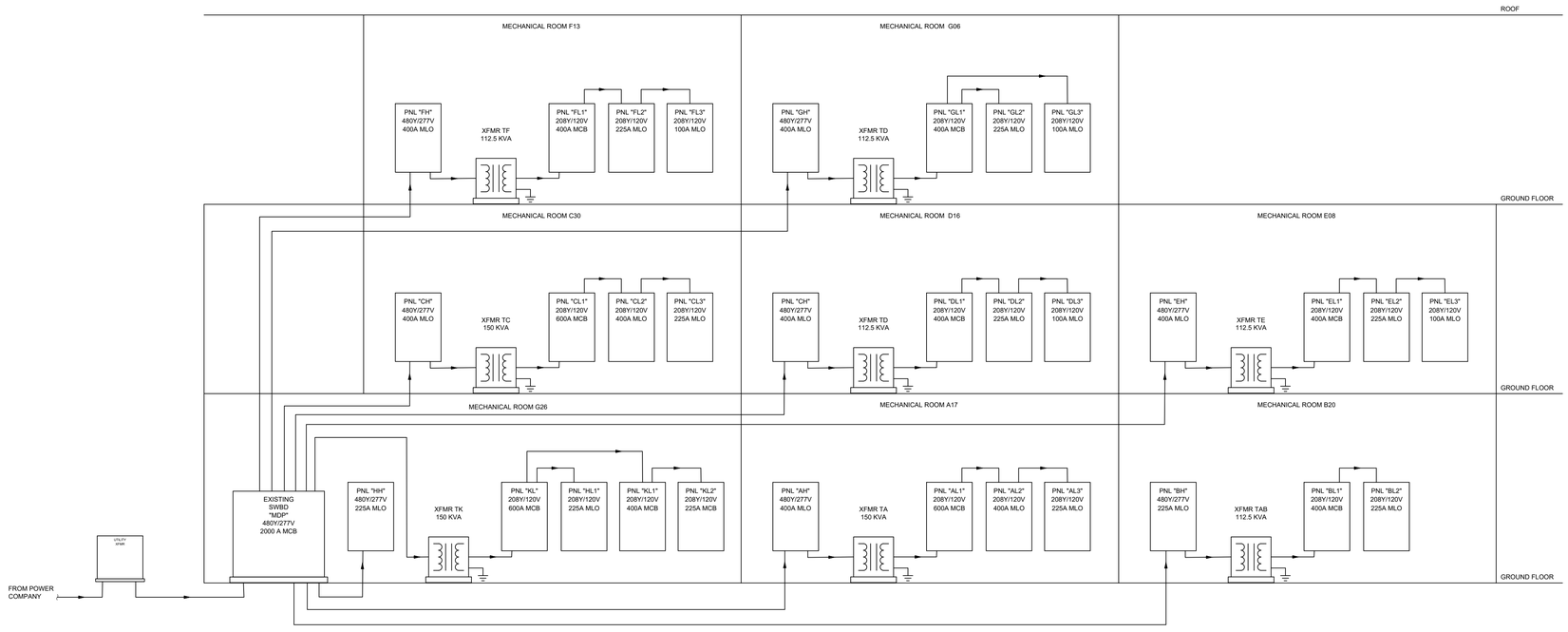
DRAWN BY SF
APPROVED BY WK
CHECKED BY WK
DATE 3/31/2025

TITLE
SCHEDULES

PROJECT NO. 50185618

E-601

SHEET NO.



NOTE: EXISTING RISER IS FOR REFERENCE ONLY.

1 ELECTRICAL PARTIAL POWER RISER

SCALE:NTS

30-Mar-23

FA General Alarm Matrix Smithfield Middle School

SYSTEM OUTPUTS

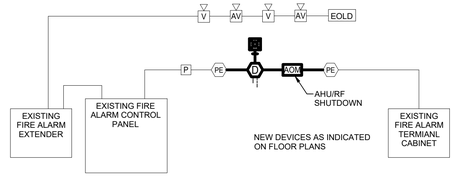
SYSTEM INPUTS	ACTUATE COMMON ALARM SIGNAL INDICATOR	ACTUATE AUDIBLE ALARM SIGNAL	ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTUATE AUDIBLE SUPERVISORY SIGNAL	ACTUATE COMMON TROUBLE SIGNAL INDICATOR	ACTUATE AUDIBLE COMMON TROUBLE SIGNAL	ACTUATE BUILDING EVACUATION SIGNALS	DISPLAY / PRINT CHANGE OF STATUS	TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION	TRANSMIT WATERFLOW BELL FOR DURATION OF WATER FLOW	ACTIVATE WATER FLOW SIGNAL TO SUPERVISING STATION	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION	SHUTDOWN AHU / FANS	CLOSE SMOKE DAMPERS	RELEASE MAGNETICALLY HELD OPEN DOORS	DELAYED RELEASE MAG DOORS WHOSE POWER SUPPLY HAS LOST 120 VAC	UNLOCK CONTROLLED DOORS
BUILDING MANUAL FIRE ALARM STATIONS	X	X					X	X	X						X			X
SMOKE DETECTORS	X	X					X	X	X				X	X	X			X
HEAT DETECTORS	X	X					X	X	X						X			X
DUCT DETECTORS			X	X				X			X		X	X				
FIRE ALARM SYSTEM AC POWER FAIL					X	X		X				X			X	X		
FIRE ALARM SYSTEM LOW BATTERY					X	X		X				X						
FIRE ALARM SYSTEM COMMON TROUBLE					X	X		X				X						
FIRE ALARM SYSTEM SHORT CIRCUIT					X	X		X				X						
FIRE ALARM SYSTEM OPEN CIRCUIT					X	X		X				X						
FIRE ALARM SYSTEM GROUND FAULT					X	X		X				X						
INITIATION POINTS BYPASSED / DISABLED					X	X		X				X						
NOTIFICATION CIRCUITS BYPASSED / DISABLED					X	X		X				X						
DOOR RELEASE BYPASSED / DISABLED					X	X		X				X						
AHU SHUTDOWN BYPASSED / DISABLED					X	X		X				X						
OFF PREMISE REPORTING BYPASSED / DISABLED					X	X		X				X						

GENERAL NOTE:

1. FIRE ALARM SYSTEM IS EXISTING. FIRE ALARM MATRIX IS INTENDED FOR REFERENCE ONLY TO UNDERSTAND THE SYSTEM AS A WHOLE. NOT ALL COMPONETS ARE FOUND IN THIS SCOPE OF WORK.
2. ALL HVAC SYSTEMS ARE EXISTING AND SOME WILL BE MODIFIED. INFORMATION IS FOR REFERENCE ONLY. COORDINATE WITH EXISTING SYSTEMS.

2 FIRE ALARM MATRIX

SCALE:NTS



FIRE ALARM RISER NOTES:

1. EXISTING FIRE ALARM SYSTEM IS NOTIFIER NFS2-640 BY HONEYWELL.
2. ALL WIRING SHALL BE IN MINIMUM 3/4" EMT CONDUIT.
3. SEE PLANS FOR QUANTITY AND LOCATION OF DEVICES AND EQUIPMENT. DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 72. FINAL LOCATION OF FIRE ALARM DEVICES SHALL CONFORM TO ALL APPLICABLE STATE AND LOCAL CODES AND FIRE MARSHALL REQUIREMENTS.
4. PROVIDE ALL ADDITIONAL HARDWARE REQUIRED TO ADD NEW DEVICES.
5. CIRCUITRY SHALL BE CONDUCTOR SIZE, QUANTITY, AND TYPE AS RECOMMENDED BY MANUFACTURER FOR SPECIFIC USE AS INITIATION, NOTIFICATION, AUDIO SPEAKER, RELAY, OR SIGNALING LINE CIRCUIT CONDUCTORS. WIRE AWG SIZE SHALL BE AS RECOMMENDED BY MANUFACTURER FOR GIVEN LENGTH AND LOAD. WIRING SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. CABLE SHIELD SHALL BE CONNECTED AT SINGLE POINT AS DIRECTED BY MANUFACTURER AND ONLY AT THAT POINT, SHALL BE CONTINUOUS THROUGHOUT THE CIRCUIT, AND SHALL BE INSULATED FROM GROUND.
6. SIGNALING LINE CIRCUITS SHALL BE PROVIDED WITH A MINIMUM OF 25% SPARE ADDRESSES FOR FUTURE USE. ROUTE SIGNALING LINE CIRCUITS IN CONDUITS SEPARATE FROM AUDIO/TONE SPEAKER NOTIFICATION CIRCUITS.
7. ALL SMOKE DUCT DETECTORS SHALL BE PROVIDED WITH REMOTE ALARM INDICATOR LIGHT (RAIL).
8. OWNER ACCEPTED ROOM NUMBERS SHALL BE USED WHEN PROGRAMMING THE SYSTEM. COORDINATE WITH OWNER.
9. THE ELECTRICAL CONTRACTOR SHALL REVIEW THE EXISTING INSTALLATION, EQUIPMENT, CIRCUITRY AND CIRCUITRY ROUTING, AND ANY EXISTING MANUFACTURER'S SCHEMATIC/SHOP DRAWINGS/RECORD DRAWINGS, AND PROVIDE MATERIALS, INSTALLATION, CIRCUITRY AND CIRCUITRY ROUTING IN A MANNER AS TO BE COMPATIBLE WITH THE EXISTING CONDITIONS.
10. PERFORM BATTERY CALCULATIONS ON EXISTING FIRE ALARM SYSTEM AND PROVIDE NEW BATTERIES AS REQUIRED.
12. THE SYSTEM SHALL BE 100% OPERATIONAL AT THE COMPLETION OF PROJECT.
13. UPON SMOKE DETECTION BY ANY DETECTOR OR SPRINKLER FLOW SWITCH WITHIN ZONE OR ADJACENT ZONE ON SAME FLOOR ALL AV DEVICES WILL ANNUNCIATE AND ILLUMINATE.

3 FIRE ALARM PARTIAL RISER - NEW WORK

SCALE:NTS

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JOHNSTON COUNTY PUBLIC SCHOOLS

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490 GUY RD,
CLAYTON, NC 27520

CONSTRUCTION DOCUMENTS

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041410 WILLIAM A. KEMP

3/31/2025

KEY PLAN

SCALE

REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY SF
APPROVED BY WK
CHECKED BY WK
DATE 3/31/2025

TITLE

RISER DIAGRAMS

PROJECT NO. 50185618

E-901

SHEET NO.