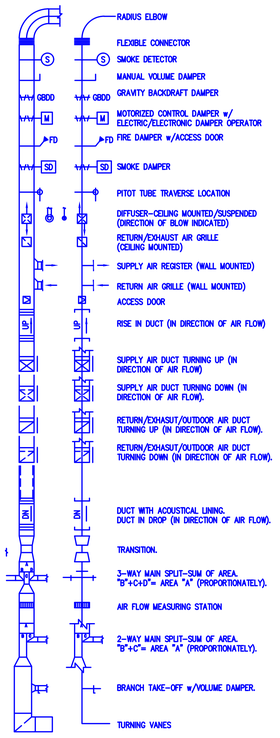
MECHANICAL LEGEND



MECHANICAL LEGEND

SYMBOL	DESCRIPTION
—(NAME)—	NEW PIPING (DARK LINE)
—(NAME)—	EXISTING PIPING (LIGHT LINED)
—(NAME)—	EXISTING PIPE/DUCT TO BE REMOVED
	PIPE TURNING UP
	PIPE TURNING DOWN
	SHUT OFF VALVE
	GATE VALVE IN VERTICAL
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF VALVE
	UNION
FD	FLOOR DRAIN
—HS—	HEATING HOT WATER SUPPLY
—HR—	HEATING HOT WATER RETURN
	CHECK VALVE
	CALIBRATED BALANCING VALVE
	TRIPLE DUTY VALVE
	STRAINER
T	THERMOSTAT/TEPERATURE SENSOR
C	CARBON DIOXIDE SENSOR
	CONNECTION OF NEW TO EXISTING
	EXTENT OF DEMOLITION
	DRAWING NOTE NUMBER
	THERMOMETER
	EXISTING EQUIPMENT TO BE REMOVED
	PRESSURE GAUGE

MECHANICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
BTUH	BRITUSH THERMAL UNIT PER HOUR
CFM	CUBIC FEET PER MINUTE
CONC.	CONCRETE
DB	DRY BULB
DIA.	DIAMETER
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EL	ELEVATION
ELEC.	ELECTRICAL
ENT	ENTERING
EWT	ENTERING WATER TEMPERATURE
EX., EXIST.	EXISTING
F	FAHRENHEIT
FD	FLOOR DRAIN
FL	FLOOR
FPM	FEET PER MINUTE
FSK	FOIL SORIM KRAFT
FT	FOOT OR FEET
GAL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HZ	FREQUENCY HERTZ
HS	HEATING WATER SUPPLY
HR	HEATING WATER RETURN
LAT	LEAVING AIR TEMPERATURE

MECHANICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTUH
MIN.	MINIMUM
NG	NATURAL GAS
No	NUMBER
OA	OUTDOOR AIR
OAD	OUTDOOR AIR DUCT
PD	PRESSURE DROP
PH, ø	PHASE (ELECTRICAL)
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	PSI GAUGE
P/T	PRESSURE/TEMPERATURE
RA	RETURN AIR
RAD	RETURN AIR DUCT
RH	REHEAT COIL
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SP	STATIC PRESSURE
TEMP	TEMPERATURE
TYP.	TYPICAL
U/G	UNDERGROUND
V	VOLTS OR VENT
VFD	VARIABLE FREQUENCY DRIVE
VEL	VELOCITY
WB	WETBULB

MECHANICAL GENERAL NOTES

1. WORK AS A MINIMUM SHALL CONFORM TO AND MEET THE REQUIREMENTS OF:
   NORTH CAROLINA STATE BUILDING CODE: MECHANICAL 2018
   NORTH CAROLINA STATE BUILDING CODE: FUEL GAS CODE 2018.
   NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE 2018.
   NFPA 70 (NATIONAL ELECTRIC CODE), CURRENT EDITION
   ASHRAE STANDARD 55–2013
   ASHRAE STANDARD 62–2013
   ASHRAE STANDARD 90.1–2013
   SMACNA: HVAC AIRDUCT LEAKAGE TEST MANUAL, 1985, 1ST EDITION
   SMACNA: HVAC DUCT CONSTRUCTION STANDARDS METAL & FLEXIBLE, 1985, 1ST EDITION
2. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE NOT INTENDED TO BE SCALED FOR DIMENSIONS, UNLESS DIMENSIONED.
3. ALL MATERIALS, EQUIPMENT AND DEVICES SHALL, AS A MINIMUM, MEET THE REQUIREMENTS OF UL WHERE UL STANDARDS ARE ESTABLISHED FOR THOSE ITEMS. ALL ITEMS SHALL BE CLASSIFIED BY UL AS SUITABLE FOR THE PURPOSE USED.
4. ALL ITEMS SHALL BE NEW, UNLESS NOTED OTHERWISE.
5. ALL MATERIALS, EQUIPMENT AND DEVICES SHALL BE CURRENT PRODUCTS BY MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH PRODUCTS.
6. ALL MECHANICAL EQUIPMENT SHALL HAVE A FACTORY APPLIED PAINTING.
7. COORDINATE LOCATION OF MECHANICAL WORK WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES.
8. COORDINATE THE EXACT LOCATION OF AIR DEVICES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS.
9. INSTALL ALL EQUIPMENT AND MATERIAL IN ACCORDANCE WITH MANUFACTURER'S WRITTEN PRINTED INSTRUCTIONS AND RECOMMENDATIONS.
10. COORDINATE WITH AND OBTAIN PERMITS AND INSPECTIONS FROM AUTHORITY HAVING JURISDICTION.
11. PROVIDE OWNER WITH CERTIFICATES OF FINAL INSPECTION AND ACCEPTANCE FROM AUTHORITY HAVING JURISDICTION.
12. MAKE CONNECTIONS FROM MECHANICAL EQUIPMENT TO DUCTWORK USING FLEXIBLE DUCT CONNECTIONS.
13. ALL EQUIPMENT, DUCTWORK ABOVE CEILING SHALL BE SUPPORTED FROM BUILDING STRUCTURE ABOVE, UNO.
14. WHERE DUCTWORK PENETRATES FIRE RATED BARRIERS (WALLS, FLOORS AND CEILINGS) SEAL OPENING AROUND DUCTWORK WITH U.L. LISTED FIRE STOPPING MATERIAL TO MAINTAIN THE FIRE RATING OF THE BARRIER.
15. DUCT SIZES INDICATED ARE NET FREE INSIDE DIMENSIONS.
16. ALL DUCTWORK SHALL HAVE TRANSVERSE JOINTS AND LONGITUDINAL SEAMS SEALED IAW SMACNA: HVAC AIRDUCT LEAKAGE TEST MANUAL, 1985, 1ST EDITION.
17. SMOKE DETECTORS SHALL BE FURNISHED AND INSTALLED AS SHOWN ON THE PLANS. THE SMOKE DETECTOR SHALL BE WIRED TO DE-ENRGIZE THE FAN UPON DETECTION OF THE PRODUCTS OF COMBUSTION. ANOTHER SET OF CONTACTS SHALL BE PROVIDED FOR WIRING THE SMOKE DETECTOR TO THE FIRE ALARM SYSTEM (AS APPLICABLE) BY THE ELECTRICAL CONTRACTOR. PROVIDE AN ANNUNCIATOR TO INCLUDE BOTH A VISIBLE AND AN AUDIBLE SIGNAL IN AN APPROVED LOCATION WHEN THE DETECTOR IS NOT TIED INTO A BUILDING FIRE ALARM SYSTEM. THE ANNUNCIATOR SHALL BE IDENTIFIED AS "AIR DUCT DETECTOR TROUBLE".
18. ALL MEDIUM PRESSURE DUCT TO BE GALVANIZED STEEL RECTANGULAR, SPIRAL OR FLAT OVAL.
19. ALL CONTROL WIRING SHALL BE PLENUM CABLE.
20. CONCEALED SUPPLY, RETURN AND OUTSIDE AIR TO BE WRAPPED WITH R-6 FIBERGLASS DUCT WRAP. WRAP SUPPLY DIFFUSER BACKS IN CONCEALED SPACES WITH FULLY DUCTED RETURN.

PROJECT: ALAMANCE/BURLINGTON SCHOOL SYSTEMS, ALTAMAHAW–OSSIPEE MS, ELON, NC
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE

PRESCRIPTIVE X ENERGY COST BUDGET

THERMAL ZONE 4A

EXTERIOR DESIGN CONDITIONS
WINTER DRY BULB 18.0 °F
SUMMER DRY BULB N/A
SUMMER WET BULB N/A

INTERIOR DESIGN CONDITIONS
WINTER DRY BULB 70°F
SUMMER DRY BULB 74°F

HEAT LOAD: EXISTING LOAD PLUS 341 MBH (GYM HEATING LOAD)

COOLING LOAD: EXISTING LOAD PLUS 404.2 MBH (GYM COOLING LOAD)

DESCRIPTION: HEATING PROVIDED BY EXISTING BOILER. ADMINISTRATION AREA SERVED BY SPLIT SYSTEMS. CLASSROOMS SERVED BY A COMBINATION OF SPLIT SYSTEMS AND UNIT VENTILATORS. NEW SERVED BY GROUND MOUNTED PACKAGED UNIT.

EXHAUST FANS: EXISTING

LIST OF EQUIPMENT EFFICIENCIES: SEE SCHEDULE.

EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEMS): SEE SCHEDULE

DESIGNER STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS, AND EQUIPMENT REQUIREMENTS OF THE NORTH CAROLINA STATE BUILDING CODE, ENERGY CODE – 2018 EDITION.

SIGNED:
NAME: KEVIN L. WATERS, PE
TITLE: MECHANICAL ENGINEER
DATE: 04/28/2023

Air Distribution Schedule

Mark	Type	Size	Mounting	Manufacturer	Model
R	Return	60x48	Surface	Price	530

Notes:

Natural Gas Calculation Chart

Capacity	MBH
GPU-1	320
GPU-2	320
GPU-3	90
Total Capacity	730
Most Remote Fixture (Ft.)	180
Building Gas Main Size 2 PSI (note 1)	1"

Notes:
1. Pipe size determined from table 402.4(5) of the 2018 North Carolina Fuel Gas Code.

A

Constant Volume Unit Outside Air Calculations

TAG	Space Description	Room Number	Occupied Area (Sq Ft)	Area OA Rate (CFM / Sq. Ft.)	Area OA (CFM)	Occupants per 1,000 Sq. Ft.	Number of Occupants	Airflow per Person (CFM)	People OA Total (CFM)	Total Req. OA (CFM)	Ez	Corrected OA (CFM)	Note(s)
SSU-1	**Total**		**962**							**0**	**0.8**	**98**	
	Office	100F	336	0.06	20	0	2	5	10	30	1.0	30	
	Office	100E	344	0.06	21	0	4	5	20	41	1.0	41	
	Office	100D	282	0.06	17	0	2	5	10	27	1.0	27	
SSU-2	**Total**									**0**	**0.8**	**177**	
	Office	102	603	0.06	36	5	3	5	15	51	1.0	51	
	Office	100	536	0.06	32	5	2	5	10	42	1.0	42	
	Office	100A	707	0.06	42	5	2	5	10	52	1.0	52	
	Closet	100B	123	0.06	7	0	0	0	0	7	1.0	7	
	Cooridor	100C	389	0.06	23	0	0	0	0	23	1.0	23	
AHU-1/2	Cafeteria	200	2,620	0.18	472	70	183	7.5	1376	1847	0.8	2309	1
FCU-4	Cafeteria	200	w/above	0.06	0	0	0	0	0	0	0.8	0	2
DSSU-3/4	Classroom	202	N/A	0	0	0	0	0	0	0	0.8	0	3
FCU-1	Office	203	239	0.06	14	0	2	5	10	24	1.0	24	
FCU-2	Office	205	259	0.06	16	0	2	5	10	26	1.0	26	
UV-12	Classroom	204	949	0	0	35	33	7.5	249	249	1.0	249	
UV-11	Classroom	206	885	0	0	35	31	7.5	232	232	1.0	232	
FCU-3	Office	207	223	0.06	13	0	4	5	20	33	1.0	33	
UV-10	Classroom	208	871	0	0	35	30	7.5	229	229	1.0	229	
UV-9	Office	210	194	0.06	12	0	2	5	10	22	1.0	22	
UV-2	Classroom	211	831	0	0	35	29	7.5	218	218	1.0	218	
UV-8	Classroom	212	827	0	0	35	29	7.5	217	217	1.0	217	
UV-3	Classroom	213	831	0	0	35	29	7.5	218	218	1.0	218	
UV-7	Classroom	214	818	0	0	35	29	7.5	215	215	1.0	215	
UV-4	Classroom	215	833	0	0	35	29	7.5	219	219	1.0	219	
UV-6	Classroom	216	818	0	0	35	29	7.5	215	215	1.0	215	
GPU-3	Media Center	217	1,891	0.12	227	0	29	10	290	517	0.8	646	
UV-5	Classroom	218	782	0	0	35	27	7.5	205	205	1.0	205	
SSU-10	Classroom	300	913	0	0	35	32	7.5	240	240	0.8	300	
SSU-3	Classroom	301	817	0	0	35	29	7.5	214	214	0.8	268	
SSU-9	Classroom	302	903	0	0	35	32	7.5	237	237	0.8	296	
SSU-4	Classroom	303	914	0	0	35	32	7.5	240	240	0.8	300	
SSU-5	Classroom	305	823	0	0	35	29	7.5	216	216	0.8	270	
SSU-8	Classroom	306	1,025	0	0	35	36	7.5	269	269	0.8	336	
SSU-7	Classroom	308	898	0	0	35	31	7.5	236	236	0.8	295	
SSU-6	Classroom	310	850	0	0	35	30	7.5	223	223	0.8	279	
GPU-1/2	Gym	400	7,608	0.3	2282	40	304	0	0	2282	0.8	2853	

1. Space square footage includes space served by FCU-4.
2. Space outdoor air handled by AHU-1/2
3. Existing equipment to remain.

A

Split System AHU Schedule

Tags	Manufacturer	Model	Area Served	Airflow CFM	OSA CFM	Cooling Capacity BTUH	Heating Capacity BTUH	Electric Heat KW	Weight lb	MCA A	MOP A	Electrical V/hz/ø	Notes
SSU-1	Trane	TEM4A0C43M41	Office	1400	200	40,728	39,000	10	150	58	60	208-230/60/1	1,2,3,4,5,6,7
SSU-2	Trane	TWE1204	Office	4000	300	124,150	117,070	25	442	44	45	460/60/3	1,2,3,4,5,6,7
SSU-3 thru 10	Trane	GAM5B0B36M31	Classroom	1200	150	35,794	31,400	15	150	48	50	208-230/60/1	1,2,3,4,5,6,7

Notes:
1. Indoor unit power fed separate from outdoor unit. Wiring by Electrical Contractor.
2. Provide with wall mounted sensor and BACnet DDC controls.
3. Verify Voltage before installation
4. Provide MERV 8 filters.
5. Outdoor air connection is existing and tied into return duct from outdoor air louver.
6. Install motorized outdoor air damper in existing outdoor air ductwork control via BAS system.
7. Balance to outdoor air setting indicated in table.

Split System Condensing Unit Schedule

Tags	Manufacturer	Model	Area Served	Cooling Capacity BTUH	Heating Capacity BTUH	SEER/EER	Weight lb	Electrical V/hz/ø	MCA A	MOP A	Notes
SSCU-1	Trane	4TWR4042N1	Office	40,728	39,000	14.3	160	208/1/60	24	40	1,2,3
SSCU-2	Trane	TWA1204	Office	124,150	117,070	11.2	433	460/60/3	18	25	1,2,3
SSCU-3 thru 10	Trane	4TWA4036	Office	35,794	31,400	15.0	250	460/60/3	6	15	1,2,3

Notes:
1. Provide with low ambient control and crankcase heater.
2. Provide with coil guards.
3. Heat Pump

Gas Packaged Unit Schedule

Tag	Manufacturer	Model	Nominal Capacity Tons	Design Airflow CFM	Outside Airflow CFM	Design ESP in H2O	Cooling EDB °F	Cooling EWB °F	Cooling LDB °F	Cooling LWB °F	Gross Total Capacity MBh	Heat Type	Input Heating Capacity MBH	Output Heating Capacity MBH	Heating EAT °F	Heating LAT °F	EER Rating & ARI Conditions	SEER Rating & ARI Conditions	Supply Fan Motor HP	Power Supply V/hz/ø	MCA A	MOP A	Max Unit Operating Weight lb	Notes
GPU-1	Trane	YHJ240A	20	6000	1000	1.25	79.1	65.3	53.1	52.2	230.4	Gas	320.0	260.0	50.0	89.2	10.8	16.8	3.1	460/60/3	54	70	2200	1,2,3,4,5,6,7
GPU-2	Trane	YHJ240A	20	6000	1000	1.25	79.1	65.3	53.1	52.2	230.4	Gas	320.0	260.0	50.0	89.2	10.8	16.8	3.1	460/60/3	54	70	2200	1,2,3,4,5,6,7
GPU-3	Trane	4YCZ5048	4	1600	645	0.8	80.0	67.0	59.1	57.6	47.5	Gas	90.0	72.0	60.0	101.5	11.0	15.0	0.75	208/60/1	34.1	50	531	2,3,4,5,6

Notes:
1. Provide with hot gas reheat for humidity control
2. Provide unit with 2" filter frame, crankcase heater and evaporator defrost
3. Provide unit with 0-100% economizer with barometric relief
4. Provide unit with BACnet DDC controls and zone sensor.
5. Provide with five year compressor warranty (parts only)
6. Provide unit with condensate float switch
7. Provide unit with Single Zone VAV Controls

A

FOR CONSTRUCTION

Systems Contractors, LLC
Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
P.O. Box 16023, Greensboro, North Carolina, 27416
Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32717 KEVIN L. WATERS ENGINEER
04/28/2023

ALAMANCE/BURLINGTON SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL SCHEDULES, NOTES, ABBREVIATIONS & SCHEDULES

REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A–4216_M0.1.DWG
SHEET NUMBER:

M0.1

Air Handling Unit Schedule

Tags	Mfr	Model	Unit Type	Area Served	Base Unit		Fan				Cooling Coil											Re-Heating Coil							Electrical			Notes
					Unit Airflow CFM	Installed Weight LB	Horsepower hp	External Staic Pressure IN H2O	Total Brake HP (All Fans) HP	Total Staic Pressure IN H2O	Entering Dry Bulb °F	Entering Wet Bulb °F	Leaving Dry Bulb °F	Leaving Wet Bult °F	Sensible Capacity MBH	Total Capacity MBH	Entering Water Temp °F	Leaving Water Temp °F	Flow Rate GPM	Coil Rows	Fluid Pressure Drop FT H2O	Entering Dry Bulb °F	Leaving Dry Bulb °F	Total Capacity MBH	Entering Water Temp °F	Leaving Water Temp °F	Flow Rate GPM	Coil Rows	Fluid Pressure Drop FT H2O	Voltage	MCA	MOP	
AHU-1	MagicAire	BVE20B	VAHU	Cafeteria	2,000	300	1.5	0.5	1.0	1.2	80	67	58.9	56.8	47.8	65.4	44	54	15.6	4	14.0	60	99	84.9	180	160.0	12.3	2	2.6	115V/1ph	25	45	1,2,3,7
AHU-2	MagicAire	BVE20B	VAHU	Cafeteria	2,000	300	1.5	0.5	1.0	1.2	80	67	58.9	56.8	47.8	65.4	44	54	15.6	4	14.0	60	99	84.9	180	160.0	12.3	2	2.6	115V/1ph	25	45	1,2,3,7
UV-1 thru 8, 10-12	Trane	VUVE125	VUV	Classroom	1,339	350	0.4	0	0.30	0.4	80	67	61.6	58.5	26.9	36.0	44	54	7.0	4	7.0	60	90	44.6	180	160.0	1.3	2	0.2	208V/1ph	5	15	4,5,7
UV-9	Trane	VUVE075	VUV	Classroom	738	250	0.3	0	0.25	0.4	80	67	58.4	55.3	15.6	24.0	44	54	4.8	4	3.4	60	90	21.5	180	160.0	1.0	2	0.5	208V/1ph	3	15	4,5,7
FCU-1, 2	Trane	FCJB040	VFCU	Offices	400	125	0.2	0	0.10	0.4	80	67	55.5	54.4	10.7	15.4	44	54	3.0	4	17.0	60	89	12.5	180	162.0	1.4	1	0.4	115V/1ph	3	15	4,5,7
FCU-3	Trane	FCJB040	VFCU	Offices	400	125	0.2	0	0.1	0.4	80	67	55.5	54.4	10.7	15.4	44	54	3.0	4	17.0	60	89	12.5	180	162.0	1.4	1	0.4	115V/1ph	3	15	6,7

Notes:

1. Provide MERV 8 filters.
2. Outdoor air connection is existing and tied into return duct from outdoor air louver.
3. Install motorized outdoor air damper in existing outdoor air ductwork control via BAS system.
4. Outdoor air connection through existing wall louver.
5. Install motorized damper at wall louver and control via BAS system.
6. Outdoor air connection via new brick vent with motorized damper control via BAS.
7. Balance to outdoor air setting indicated in table.

Unit Types: - VAHU = Vertical Air Handler
- VUV = Vertical Unit Ventilator
- VFCU = Vertical Exposed Fan Coil

A

Ductless Split System AHU Schedule

Tags	Manufacturer	Model	Room Served	Airflow CFM	OSA CFM	Cooling Capacity BTUH	Heating Capacity BTUH	Weight lb	Electrical V/hz/ø	Notes
DSSU-1	Mitsubishi	MSZ-FS18NA	Hallway	225-437	0	17,200	19,000	29	208/60/1	1,2
DSSU-2	Mitsubishi	MSZ-FS18NA	Hallway	225-437	0	17,200	19,000	29	208/60/1	1,2
DSSU-5	Mitsubishi	MSZ-GL24NA	Hallway	388-738	0	22,400	27,600	40	208/60/1	1,2

Notes:

1. Indoor unit power fed from outdoor unit. Wiring by Electrical Contractor.
2. Provide with wired controller.

Ductless Split System Condensing Unit Schedule

Tags	Manufacturer	Model	Room Served	Cooling Capacity BTUH	Min. Cooling Capacity BTUH	Heating Capacity BTUH	SEER	Weight lb	Electrical V/hz/ø	MCA A	MOP A	Notes
DSSCU-1/2	Mitsubishi	MXZ-4C36NA3	Hallway	36,400	11,300	43,000	19.2	140	208/1/60	23	25	1,2,3
DSSCU-5	Mitsubishi	MUZ-GL24NA	Hallway	22,400	8,200	27,600	20.5	120	208/1/60	17	20	1,2,4

Notes:

1. Provide with wind baffle for low ambient operation.
2. Provide with Inverter compressor and remote thermostat.
3. 1/4" Liquid line and 1/2" Gas line.
4. 3/8" Liquid line and 5/8" Gas line.

FOR CONSTRUCTION

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SAMET CORPORATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32717 ENGINEER

04/28/2023

ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL SCHEDULES

REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M0.1.DWG
SHEET NUMBER:

M0.2

Modular Indoor Central-Station Air-Handling Units

PART 1 - GENERAL

1.01 SUBMITTALS

A. No equipment shall be fabricated or delivered until the receipt of approved shop drawings from the Owner or Owner's approved representative.

B. AHU manufacturer shall provide the following information with each shop drawing/product data submission:

1. Dimensioned arrangement drawings for each AHU including a plan and elevation view of the assembled unit with overall dimensions, lift points, unit shipping split locations and dimensions, installation and operating weights, and installation, operation and service clearances.
2. All electrical, piping, and ductwork requirements, including sizes, connection locations, and connection method recommendations.
3. Each component of the unit shall be identified and mechanical specifications shall be provided for unit and accessories describing construction, components, and options.
4. All performance data, including capacities and airside and waterside pressure drops, for components.
5. Fan curves shall be provided for fans with the design operating points indicated. Data shall be corrected to actual operating conditions, temperatures, and altitudes.

C. The AHU manufacturer shall provide appropriate sets of submittals as referenced in the General Conditions and shall submit to the Owner electronic copies of the IOM.

D. The AHU manufacturer shall list any exceptions to the specification.

1.02 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

B. Units shall ship fully assembled up to practical shipping and rigging limitations. Shipping splits shall be clearly defined on submittal drawings. Cost associated with non-conformance to shop drawings shall be the responsibility of the manufacturer. AHU's less than 100-inches wide shall allow for forklift transport and maneuverability on the jobsite.

C. Deliver units to jobsite with fan motor(s), sheave(s), and belt(s) completely assembled and mounted in units.

D. Indoor units shall be shipped in a clear shrink-wrap or stretch-wrap to protect unit from in-transit rain and debris per ASHRAE 62.1 recommendations.

E. Installing contractor shall be responsible for storing AHU in a clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.

1.03 WARRANTY

A. AHU manufacturer shall provide, at no additional cost, a standard parts warranty that covers a period of one year from unit start-up or 18 months from shipment, whichever occurs first. This warrants that all products are free from defects in material and workmanship and shall meet the capacities and ratings set forth in the equipment manufacturer's catalog and bulletins.

PART 2 - PRODUCTS

2.01 GENERAL

A. Unit layout and configuration shall be as defined in project plans and schedule.

2.02 UNIT CASING

A. The entire air handler shall be constructed of galvanized steel. All doors shall have gasketing around full perimeter to prevent air leakage. Contractor shall be responsible to provide connection flanges and all other framework that is needed to properly support the unit.

B. All panels shall be 2-inch double wall construction to facilitate cleaning of unit interior.

C. Unit floor shall be of sufficient strength to support 300-lb load during maintenance activities, and shall deflect no more than .005-inches when sitting on a support structure.

D. Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft^2*h*F/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel assembly shall comply with NFPA 90A.

E. Access panels and/or access doors shall be provided in all sections to allow easy access to drain pan, coil(s), motor, drive components and bearings for cleaning, inspection, and maintenance.

F. Access panels and doors shall be fully removable without the use of specialized tools to allow complete access of interior surfaces.

2.03 ACCESS DOORS

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

2.04 PRIMARY DRAIN PANS

A. The drain pan shall be designed in accordance with ASHRAE 62.1 being of sufficient size to collect all condensation produced from the coil and sloped in two planes, pitched toward drain connections, promoting positive drainage to eliminate stagnant water conditions when unit is installed level and trapped per manufacturer's requirements. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition. Drainpan shall be polymer

2.05 SUPPLY FAN

A. Fan sections shall have a minimum of one hinged and latched access door located on the drive side of the unit to allow inspection and maintenance of the fan, motor, and drive components. Construct door(s) per Section 2.04.

B. Provide fans of type specified on the schedule. Belt drive fan shafts shall be solid steel, coated with a rust-inhibiting coating, and properly designed so that fan shaft does not pass through first critical speed as unit comes up to rated RPM.

C. Belt drive fans with integral frame motors shall be internally isolated to inhibit noise and vibration through the ductwork and building structure. A flexible connection shall be installed between the fan and unit casing to ensure complete isolation. Fan and motor shall be internally isolated with spring isolators. If fans and motors are not internally isolated, then the entire unit shall be externally isolated from the building, including supply and return duct work, piping, and electrical connections. External isolation shall be furnished by the installing contractor in order to avoid transmission of noise and vibration through the ductwork and building structure.

D. Belt-driven fans shall be provided with self-aligning, anti-friction bearings selected for L-50 200,000-hour average life per ANSI/AFBMA Standard 9

2.06 MOTORS AND DRIVES

A. All motors, and drives for belt drive fans, shall be factory-installed and run tested. Motors for belt driven fans shall be installed on a slide base to permit adjustment of belt tension. Slide base shall be designed to accept all motor sizes offered by the air-handler manufacturer for that fan size to allow a motor change in the future, should airflow requirements change. Fan sections without factory-installed motors shall have motors field installed by the contractor. The contractor shall be responsible for all costs associated with installation of motor and drive, alignment of sheaves and belts, run testing of the motor, and balancing of the assembly.

B. Integral horsepower motors shall meet or exceed all NEMA Standards Publication MG 1 - 2006 requirements and comply with NEMA Premium efficiency levels when applicable. Motors shall comply with applicable requirements of NEC and shall be UL Listed.

C. All fan types utilizing integral horsepower motors, shall use 4-pole, 1800 rpm, motors, NEMA B design, with Class B insulation, capable to operate continuously at 104 deg F (40 deg C) without tripping overloads.

D. Motors shall have a +/- 10 percent voltage utilization range to protect against voltage variation.

E. V-Belt drives for housed fans shall be 1100 rpm (1050 - 1150 variable) pitch rated at 1.5 times the motor nameplate. Drives 20 hp and larger or any drives on units equipped with VFDs and housed fans shall be fixed pitch.

F. All housed fans with motors 15 hp and larger shall be equipped with multiple belt drives.

G. Manufacturer shall provide for each unit with a housed fan a nameplate with the following information to assist air balance contractor in start up and service personnel in maintenance:

2.07 COILS

A. Coils section header end panel shall be removable to allow for removal and replacement of coils without impacting the structural integrity of the unit.

B. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil.

C. Coils shall be manufactured with plate fins to minimize water carryover and maximize airside thermal efficiency. Fin tube holes shall have drawn and belled collars to maintain consistent fin spacing to ensure performance and air pressure drop across the coil as scheduled. Tubes shall be mechanically expanded and bonded to fin collars for maximum thermal conductivity. Use of soldering or tinning during the fin-to-tube bonding process is not acceptable due to the inherent thermal stress and possible loss of bonding at that joint.

D. Hydronic Coils

1. Supply and return header connections shall be such that direction of coil water-flow is counter to direction of unit air-flow.
2. Coils shall be proof-tested to 300 psig and leak-tested to 200 psig air pressure under water.
3. Headers shall be constructed of round copper pipe.

PART 3 - EXECUTION

3.01 SHIPPING

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

3.02 FIELD EXAMINATION

A. The Mechanical Contractor shall verify that the mechanical room is ready to receive work and the opening dimensions are as indicated on the shop drawings and contract documents.

3.03 INSTALLATION

A. The Mechanical Contractor shall be responsible to coordinate ALL of his installation requirements with the Owner and the Owner's selected Mechanical Contractor to ensure that a complete installation for each unit is being provided. Coordination efforts shall include such items as unloading and hoisting requirements, field wiring requirements, field piping requirements, field ductwork requirements, requirements for assembly of field-bolted or welded joints, and all other installation and assembly requirements.

Fan Coil Units

PART 1 - GENERAL

1.01 WARRANTY

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

PART 2 - PRODUCTS

2.01 GENERAL UNIT DESCRIPTION

A. Manufacturer shall provide unit arranged for draw-through application. Unit layout and configuration shall be as defined in project plans and schedule. Blow-through is only acceptable when consideration is given to capturing downstream moisture carryover. Considerations include downstream moisture eliminators and/or extended blank modules with condensate drain pans.

2.02 UNIT CASING

A. The entire air handler shall be constructed of galvanized steel. The removal of access panels shall not affect the structural integrity of the unit once the unit is installed. Contractor shall be responsible to provide connection flanges and all other framework that is needed to properly support the unit.

B. Access panels shall be on side of the unit in all sections to allow easy access to drain pan, filter, coil(s), and motor components for cleaning, inspection, and maintenance.

C. Access Panels: Removable access panels shall be provided on side of the unit to facilitate service access to drain pans, motors, coil(s). Access panel for filter removal shall be provided on side of the unit.

D. Cabinet: Casing shall be manufactured of heavy gauge galvanized steel.

2.03 COILS

A. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil.

B. Coils shall be manufactured with plate fins to minimize water carryover and maximize airside thermal efficiency. Fin tube holes shall have drawn and belled collars to maintain consistent fin spacing to ensure performance and air pressure drop across the coil are as scheduled. Tubes shall be mechanically expanded and bonded to fin collars for maximum thermal conductivity. Use of soldering or tinning during the fin-to-tube bonding process is not acceptable due to the inherent thermal stress and possible loss of bonding at that joint.

C. Construct coil casings of galvanized steel. End supports shall have belled tube holes to minimize wear of the tube wall during thermal expansion and contraction of the tube.

D. Hydronic Coils

1. Supply and return header connections shall be clearly labeled on outside of units, such that direction of coil water-flow is counter to direction of unit air-flow.
2. Coils shall be proof tested to 450 psig and leak tested to 300 psig air pressure under water.
3. Headers shall be constructed of round copper pipe.
4. Unit shall be provided with minimum 3/8 inch O.D. copper coils. All fins shall be aluminum.
5. All coil connections shall be on same side of unit.

2.04 DRAIN PAN

A. Drain Pan(s) shall be constructed of corrosion resistant material. Acceptable materials include polymer or stainless steel. Units with cooling coils shall have drain pans under complete cooling coil section that extend beyond the air-leaving side of the coil to ensure capture of all condensate in section.

B. Drain pan manufacturer shall either insulate bottom of drain pan with closed cell foam or provide double wall internally insulated construction to eliminate bottom sweating.

C. Drain pan shall be sloped in two planes, pitched toward drain connections to ensure complete condensate drainage when unit is installed level and trapped per manufacturer's installation instructions. Units without drain pans sloped in two planes shall coat drain pans with anti-microbial treatment.

D. Drain pan(s) shall have main and auxiliary drain connections with auxiliary outlet higher than the main connection.

E. Coil(s) shall be mounted above the drain pan to facilitate easy and complete inspection, cleaning, and removal. Coil(s) may not sit in drain pan.

2.05 FANS

A. Provide single-wheel, dual-width, dual-inlet, forward curved centrifugal fans as specified on the schedule. All fans shall be dynamically balanced.

2.06 MOTORS

A. All motors shall be factory-installed and run tested. To facilitate field replacement of motors, a removable fan inlet cone shall be provided on the drive side of the fan/motor assembly.

B. Motor shall be ECM programmable type. The motor shall be preprogrammed in the factory to meet the specified airflow requirements.

C. Fan motor shall have permanently lubricated and sealed bearings, protected by an internal thermal overload.

D. Single phase motors shall be selected to operate continuously at 104 F (40 C) ambient without tripping on overloads. Motors shall have a +/- 10 percent voltage utilization range to protect against voltage variation.

2.07 FILTERS

A. Provide removable one- or two-inch thick filters easily removable from side of the unit. All units shall use standard filter sizes.

2.08 CONTROLS

A. Fan motor and end devices shall be wired back to a control box enclosure. A junction box shall be provided for single point power connection.

B. The control package shall include the following at a minimum:
1. 24 VAC transformer
2. Disconnect switch

C. The control package shall include the following options :
1. Fan status relay

D. Control Interface - Unit shall be factory run tested and end devices shall be factory wired to terminal strip in an external junction box and tested for wiring continuity.

PART 3 - EXECUTION

3.01 SHIPPING

A. Paper copies of the IOM shall also be shipped with each unit.

B. The manufacturer shall identify all shipments with the order number. Enough information shall be provided with each shipment to enable the Mechanical Contractor to confirm the receipt of units when they are received. For parts too small to mark individually, the manufacturer shall place them in containers.

C. To protect equipment during shipment and delivery, unit air inlet and outlet openings shall ship from manufacturer with removable sealed covering. Covering shall not constrain the unit installation process.

D. After loading the equipment for shipment, the manufacturer shall contact the shipping contact on the order and provide the name of the carrier, description of equipment, order number, shipping point, and date of shipment.

Ductless Split Systems

1. System Description

The heat pump air conditioning system shall be a Mitsubishi Electric MXZ split system with Variable Compressor Speed Inverter Technology (VCSI), charged with R410A refrigerant. The system shall consist of one, two, three or four slim silhouette, compact wall mounted evaporator section(s) with wireless controller. The outdoor unit shall be a horizontal discharge single phase unit.

2. Quality Assurance

a) The units shall be listed by Electrical Testing Laboratories (ETL) and bear the ETL label.
b) All wiring shall be in accordance with the Canadian Electrical Code.
c) The units shall be rated in accordance with ARI Standard 210 and bear the ARI label.
d) The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which are a set of standards applying to environmental protection set by the International Standard Organization (ISO).

3. Warranty

The units shall have a manufacturer's warranty for a period of five (5) years from date of installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

4. General Information

1.0) Indoor Unit General

The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, internal piping, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dry air before shipment from the factory.

1.1) Unit Cabinet

The casing shall have a white finish. Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and two (2) directions for draining shall be standard. There shall be a separate back plate which secures the unit firmly to the wall.

1.2) Fan

The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor. The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right). A motorized air sweep flow louver shall provide an automatic change in airflow by directing the air up and down to provide for uniform air distribution. The indoor unit fan shall consist of three (3) speeds, High, Medium and Low.

1.3) Filter

Return air shall be filtered by means of easily removed catechin and enzyme filters.

1.4) Coil

The evaporator coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The coil shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil.

1.5) Electrical

The electrical power of the unit, supplied from the outdoor unit shall be 208 volts or 230 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The indoor unit shall not have any supplemental electrical heat elements.

1.6) Control

This unit shall have a wireless controller to perform input functions necessary to operate the system. The controller shall consist of a Power On/Off switch, Mode Selector, Temperature Setting, Timer Control, Fan Speed Select and Auto Vane Selector. Temperature changes shall be by 2°F increments with a range of 65°F to 87°F. There shall be a 24 hour On/Off timer. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and evaporator coil temperature, receiving and processing commands from the wireless controller, providing emergency operation and controlling the outdoor unit. The control voltage between the indoor unit and the outdoor unit shall be 208 volts or 230 volts AC. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have auto change over between heating and cooling. Control system shall control the continued operation of the air sweep louvers, as well as provide on/off and system/mode function switching.

2.0) Outdoor Unit General

The unit shall be able to provide cooling operation at -10°C (14°F) and heating operation at -15°C (5°F). The outdoor unit shall be completely factory assembled, internally piped and wired.

2.1) Unit Cabinet

The casing shall be zinc coated steel with acrylic or polyester coating for corrosion protection.

2.2) Fan

The unit shall be furnished with a direct drive propeller type fan. The fan motor shall have inherent protection, be permanently lubricated bearings. The fan motor shall be mounted for quiet operation. The fan shall be provided with a raised guard to prevent contact with moving parts. The outdoor unit shall have horizontal discharge airflow.

2.3) Coil

The condenser coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The coil shall be protected with an integral metal guard. Refrigerant flow from the condenser shall be controlled by means of a linear expansion valve (LEV) metering orifice. The linear expansion valve shall be
controlled by a microprocessor controlled step motor.

2.4) Electrical

The electrical power of the unit shall be 208 volts or 230 volts, 1 phase, 60 hertz. The unit shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. Pulse Amplitude Modulation shall be incorporated into electrical circuit
The outdoor unit shall be controlled by the microprocessor located in the indoor unit. The control voltage between the indoor unit and the outdoor unit shall be 208 volts or 230 volts AC.

Pump Suction Diffusers

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

Base-Mounted, Centrifugal Hydronic Pumps

1. The pumps shall be long coupled, base mounted, single stage, end suction, vertical split case design, in cast iron stainless steel fitted, specifically designed for quiet operation. Suitable standard operations at 225°F and 175 PSIG working pressure or optional operations at up to 250°F and 250 PSIG working pressures. Working pressures shall not be de-rated at temperatures up to 250F. The pump internals shall be capable of being services without disturbing piping connections, electrical motor connections or pump to motor alignment.
2. The pumps shall be composed of three separable components a motor, bearing assembly, and pump end (wet end). The motor shaft shall be connected to the pump shaft via a replaceable flexible coupling.
3. A bearing assembly shall support the shaft via two heavy-duty re-greaseable ball bearings. Bearing assembly shall be replaceable without disturbing the system piping and shall have foot support at the coupling end. Pump bearings shall be re-greaseable without removal of the bearings from the bearing assembly. Thermal expansion of the shaft toward the impeller shall be prevented via an inboard thrust bearing.
4. The bearing assembly shall have a solid SAE1144 steel shaft. A stainless steel shaft sleeve shall be employed to completely cover the wetted area under the seal.
5. Pump shall be equipped with an internally-flushed mechanical seal assembly installed in an enlarged tapered seal chamber. Application of an internally flushed mechanical seal shall be adequate for seal flushing without requiring external flushing lines. Seal assembly shall have Buna bellows and seat gasket, stainless steel spring, and be of a carbon ceramic design with the carbon face rotating against a stationary ceramic face.
6. Bearing assembly shaft shall connect to a stainless steel impeller. Impeller shall be both hydraulically and dynamically balanced to ANSI/HI 9.6.4-2016, balance grade G6.3 and secured by a stainless steel locking cap screw or nut.
7. Pump should be designed to allow for true back pull-out allowing access to the pump's working components, without disturbing motor or piping, for ease of maintenance.
8. A center drop-out type coupling, capable of absorbing torsional vibration, shall be employed between the pump and motor. Pumps for variable speed application shall be provided with a suitable coupling sleeve. Coupling shall allow for removal of pump's wetted end without disturbing pump volute or movement of the pump's motor and electrical connections. On variable speed applications the coupling sleeve should be constructed of an neoprene material to maximize performance life.
9. An ANSI and OSHA rated coupling guard shall shield the coupling during operation. Coupling guard shall be dual rated ANSI B15.1 and OSHA 1910.219 compliant coupling guard and contain viewing windows for inspection of the coupling. No more than .25 inches of either rotating assembly shall be visible beyond the coupling guard.
10. Pump volute shall be of a cast iron design for heating systems with integrally cast pedestal volute support, rated for 175 PSIG with integral cast iron flanges drilled for 125# ANSI companion flanges. (Optional 250 PSIG working pressures are available and are 250# flange drilled.) Volute shall include gauge ports at nozzles, and vent and drain ports.
11. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Pump and motors shall be factory aligned, and shall be realigned after installation by the manufacturer's representative. Motors shall be non-overloading at any point on the pump curve and shall meet NEMA specifications and conform to standards outlined in EISA 2007.
12. Base plate shall be of structural steel or fabricated steel channel configuration fully enclosed at sides and ends, with securely welded cross members and fully open grouting area (for field grouting). The minimum base plate stiffness shall conform to ANSI/HI 1.3.8.2.1-2019 for grouted Horizontal Baseplate Design standards.
13. Pump shall be of a maintainable design and, for ease of maintenance, should use machine fit parts and not press fit components.
14. The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 9.6.4-2016 for recommended acceptable unfiltered field vibration limits (as measured per ANSI/HI 9.6.4-2016 Figure 9.6.4.2.3.1) for pumps with rolling contact bearings.
15. Pump manufacturer shall be ISO-9001 certified.
16. Each pump shall be hydrostatically tested 1.5 times the maximum rated working pressure and name-plated before shipment.
17. Pump shall conform to ANSI/HI 9.6.3.1-2012 standard for Preferred Operating Region (POR) unless otherwise approved by the engineer.

Pump Suction Diffusers

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

Classroom Unit Ventilators

1. CABINET
The unit cabinet shall be 14ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1" coated glass fiber insulation. The return air grille shall be heavy duty steel.

2. HOT WATER HEATING COIL
The coil shall have ½" copper tube of minimum wall thickness 0.016" and shall have aluminum fins. The coil supply and return headers shall be copper pipe, stubbed out for sweat connection. The coil shall be factory pressure tested at not less than 350 p.s.i. A manual air vent shall be factory installed and ball valves fitted. The coil capacity shall be as shown in the schedule.

3. CHILLED WATER COOLING COIL
The coil shall have ½" copper tube of minimum wall thickness 0.016" and shall have aluminum fins. The coil supply and return headers shall be copper pipe, stubbed out for sweat connection. The coil shall be factory pressure tested at not less than 350 p.s.i.

4. DIRECT EXPANSION EVAPORATOR COIL
The coil shall have 3/8" copper tube and aluminum fins. The coil capacities shall be as shown in the schedule. A galvanized steel pitched drain pan shall be provided. The pan shall have a 'P' trap.

5. CABINET
The unit cabinet shall be 18ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with ½" coated glass fiber insulation. The return air grille shall be heavy duty steel.

6. SUPPLY AIR FAN/MOTOR
The fan shall be a direct centrifugal type with a three speed PSC motor mounted on rubber isolation grommets.

7. OUTDOOR/RETURN AIR MIXING DAMPERS
The outdoor and return air dampers shall have airfoil section aluminum extruded blades. The dampers shall have neoprene blade tip and jamb seals. Leakage shall not exceed 4 c.f.m. per sq. ft. at 3" W.G. differential pressure, as determined by a recognized testing laboratory.

8. FILTERS
The filters shall be of the manufacturer's standard disposable type.

9. EXTERIOR WALL LOUVER
The louver shall be aluminum extruded 45 degree blades. The louver shall have ½" birdscreen attached to the inner face. The finish on the louver shall be mill finish or a color as per the Architect's instruction. The contractor shall provide a wall sleeve to suit the wall thickness.

10. LINE VOLTAGE WIRING
All internal line voltage wiring shall be by the unit manufacturer. A suitably rated remote circuit breaker shall be provided and installed by the electrical contractor.

11. INSTALLATION
The unit ventilator shall be installed plumb. Foam sealing tape shall be installed around the perimeter of the opening in the back of the unit before moving the unit into position against the wall. The exterior louver shall be caulked.

12. DDC CONTROLS
Control items shall be furnished as described in the Controls Specification.

Packaged Rooftop HVAC Equipment

PRODUCTS

PACKAGED ROOFTOP UNITS

1. Cabinet:
   a. Heavy gauge steel panels
   b. Pre-painted steel panels
   c. Full perimeter heavy gauge galvanized steel base rail
   d. Forklift slots on base rail
   e. Raised or flanged edges around duct and power entry openings
   f. Insulation:
      1. All panels adjacent to conditioned air are fully insulated with non-hygroscopic fiberglass insulation
      2. Unit base is fully insulated
      3. Unit base insulation also serves as air seal to the roof curb
   g. Access Panels are provided for compressor/controls/heating areas, blower access and air filter/economizer access;
   h. Exterior panels constructed of heavy-gauge galvanized steel with two layer enamel paint finish
   i. Coil Guards

2. Cooling System:
   a. Refrigerant type: R-410A
   b. Compressors:
      1. Scroll Type
      2. Resiliently mounted on rubber grommets for quiet operation
      3. Overload Protected
      4. Internal excessive current and temperature protection
      5. Isolated from condenser and evaporator fan air streams
      6. Refrigerant cooled
   c. Thermal Expansion Valve
   d. High capacity filter/driers
   e. High pressure switches
   f. Freezestats
   g. Crankcase heaters

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

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

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

EXECUTION

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

FOR CONSTRUCTION

Systems Contractors, LLC
Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
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SMITH CORPORATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32717 04/28/2023

ALAMANCE/BUTLINGTON SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL SPECIFICATIONS

REVISIONS	DATE
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DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M0.1.DWG
SHEET NUMBER: M0.3

Split System Condensing Units

General - R410A
All air-cooled condensing units shall have scroll compressors and are factory assembled and wired. Each unit shall ship from the factory with a nitrogen holding charge. Units shall have factory mounted, louvered, full-length steel grilles to protect the condenser coils and piping. Unit surface shall be phosphatized and finished with an air-dry paint. This air-dry paint finish shall be durable enough to withstand a minimum of 672-consecutive-hour salt spray application in accordance with standard ASTM B117.

Compressors - R-410A
Scroll compressors have simple mechanical design with only three (3) major moving parts. Scroll type compression provides inherently low vibration. 3-D compressors provide a completely enclosed compression chamber with no leakage paths. The compressor is suction gas cooled, direct drive, 3600 RPM hermetic motors. The Scroll compressor includes a centrifugal oil pump, oil level sight glass, and an oil charging valve.

Refrigerant Management - R-410A
Each compressor shall have crankcase heaters installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

Unit Control - R410A
Factory provided 115-volt control circuit includes fusing and control power transformer. The unit is wired with magnetic contactors for compressor and condenser motors, three-leg solid-state compressor overload protection, and high/low pressure cutouts. Charge isolation, reset relay and anti- recycle compressor timer is provided. Across-the-line start is standard.

Single Circuited, Condenser Coils
Condenser coils are single circuit having an all Aluminum Microchannel design. The coils are burst tested and leak tested. Factory installed liquid line service valves are standard.

Condenser Fans - R-410A
Condenser fans are direct driven with motors having thermal overload protection and permanently lubricated ball bearings.

Low Ambient Control R-410A
Low ambient option extends unit operation from 40 F to 0 F [4.5 to -17.8 C] by utilizing an external damper assembly for head pressure control.

Split System Air Handlers

General -
- Completely factory assembled
- Convertible for horizontal or vertical configuration
- Convertible for cooling only or heat pump application
- Convertible for left or right external connections (refrigerant and/or electrical)
- Convertible for front or bottom air return
- Nitrogen holding charge

Casing
- Zinc coated, heavy gauge, galvanized steel
- Weather resistant baked enamel finish
- Access panels with captive screws
- Completely insulated with foil faced, cleanable, fire retardant, permanent, odorless glass fiber material

Refrigeration System
- Distributor(s)
- Thermal expansion valves (TXVs)

Evaporator Coil
- Draw-through airflow
- Dual circuits are interlaced/intertwined
- Double sloped, removable, cleanable, composite drain pan
- Four drain pan positions

Indoor Fan
- Double inlet, double width, forward curved, centrifugal type fan
- Permanently lubricated bearings

Indoor Motor
- Thermal overload protection
- Permanently lubricated bearings
- Meet energy policy of 1992 (EPACT)
- Optional oversized motors for high static applications

Controls - *(TWE)*
- Completely internally wired
- Colored and keyed connectors, colored wires
- Magnetic indoor fan contactor
- Detachable low voltage connectors
- Single point power entry
- Evaporator defrost control

Filters
- MERV 8 high efficiency filters

Electric Heaters
- Heavy duty nickel chromium elements
- Single point power entry
- Terminal strip connections

Systems Contractors, LLC
Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
P.O. Box 16023, Greensboro, North Carolina, 27416
Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32117 ENGINEER TRENTON WARD
04/28/2023

ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

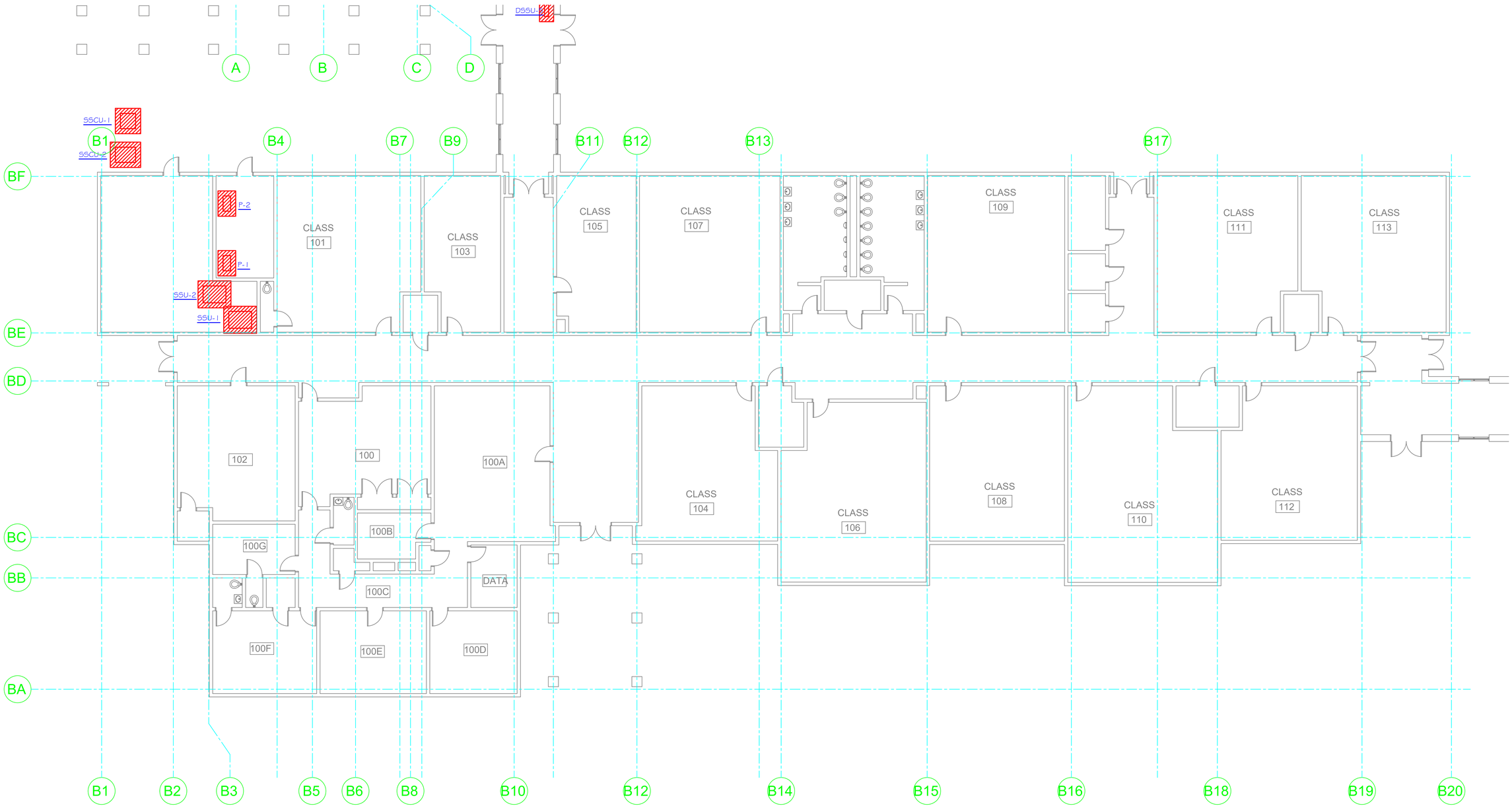
MECHANICAL
SPECIFICATIONS

REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M0.1.DWG

FOR CONSTRUCTION

A M0.4



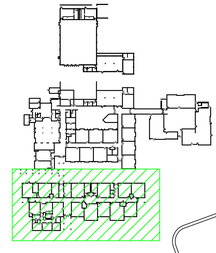
DEMOLITION

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

N

NOTES:

1. REMOVE A/C UNIT INLET DUCT TRANSITION THRU DISCHARGE DUCT TRANSITION, INCLUDING THE A/C UNIT.
2. REMOVE EXISTING ELECTRICAL FROM A/C UNIT TO DISCONNECT INCLUDING WIRE AND CONDUIT.
3. REMOVE REFRIGERANT PIPING SUFFICIENT TO REMOVE A/C UNIT.
4. REMOVE HOT WATER PPIPING SUFFICIENT TO REMOVE PUMPS.



FOR CONSTRUCTION

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Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
P.O. Box 16023, Greensboro, North Carolina, 27416
Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32717 ENGINEER REGISTERED

04/28/2023

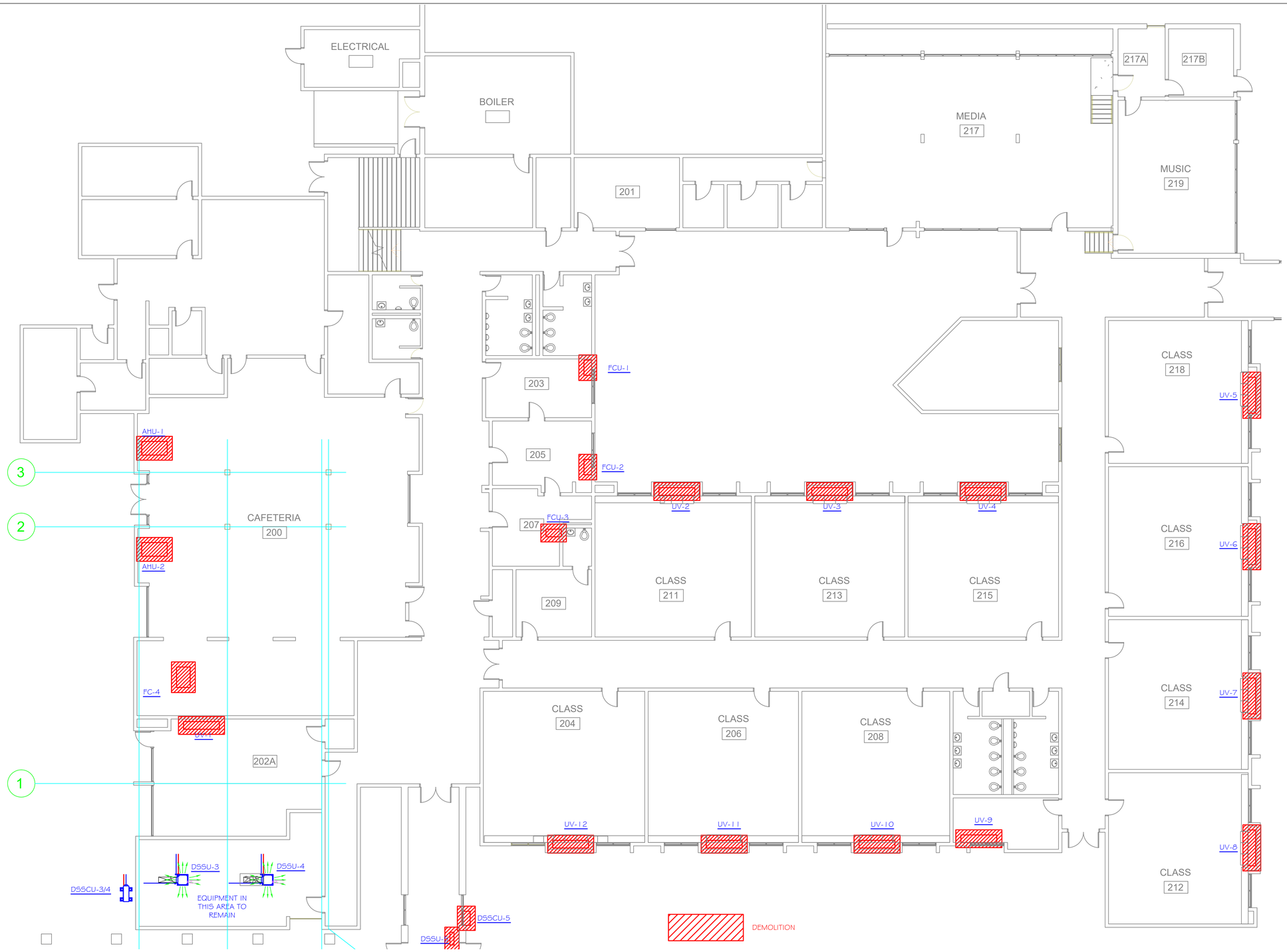
ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
DEMOLITION
PARTIAL PLAN

REVISIONS	DATE
--	--

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

MD1.0



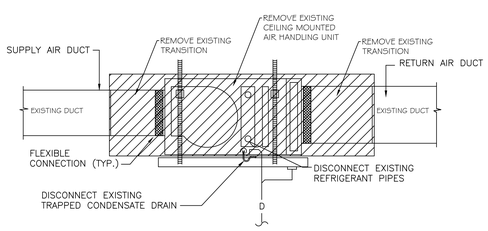
DEMOLITION

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

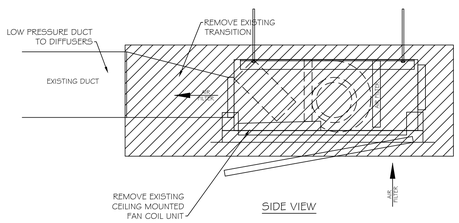
N

NOTES:

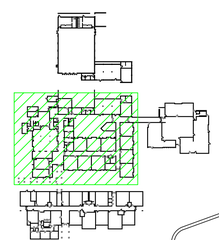
1. REMOVE A/C UNIT INLET DUCT TRANSITION THRU DISCHARGE DUCT TRANSITION, INCLUDING THE A/C UNIT.
2. REMOVE EXISTING ELECTRICAL FROM A/C UNIT TO DISCONNECT INCLUDING WIRE AND CONDUIT.
3. REMOVE CHWS/R AND HWS/R SUFFICIENT TO REMOVE A/C UNIT.
4. REMOVE REFRIGERANT PIPING SUFFICIENT TO REMOVE A/C UNIT.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



TYPICAL CEILING MOUNTED AHU DEMOLITION DETAIL
NTS



TYPICAL FAN COIL DEMOLITION DETAIL
NTS



FOR CONSTRUCTION

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Established 1977
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Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

PROFESSIONAL ENGINEER SEAL 32717 ENGINEER 04/28/2023

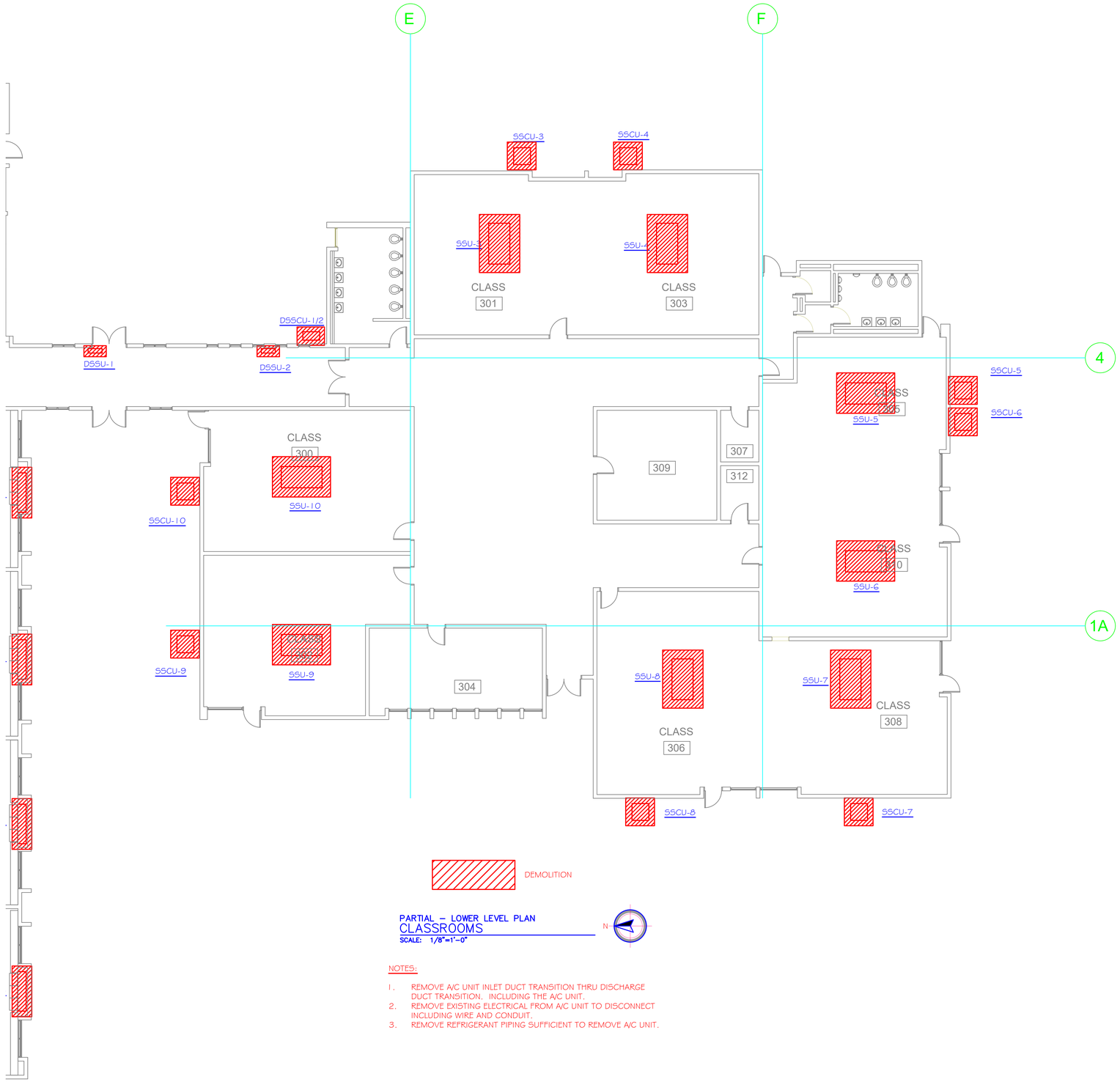
ALAMANCE/BURLINGTON SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL HVAC DEMOLITION PARTIAL PLAN

REVISIONS	DATE
--	--

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A--4216_M1.0.DWG
SHEET NUMBER:

MD1.1

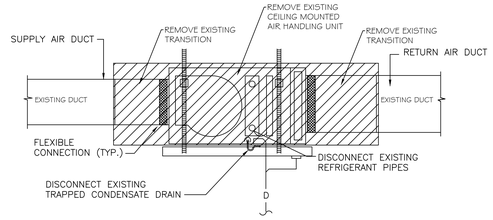


DEMOLITION

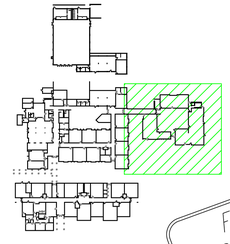
PARTIAL – LOWER LEVEL PLAN
CLASSROOMS
SCALE: 1/8"=1'-0"

NOTES:

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



TYPICAL CEILIING MOUNTED AHU DEMOLITION DETAIL
NTS



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SAMET CORPORATION

PROFESSIONAL ENGINEER SEAL 32717 ENGINEER REGISTERED
04/28/2023

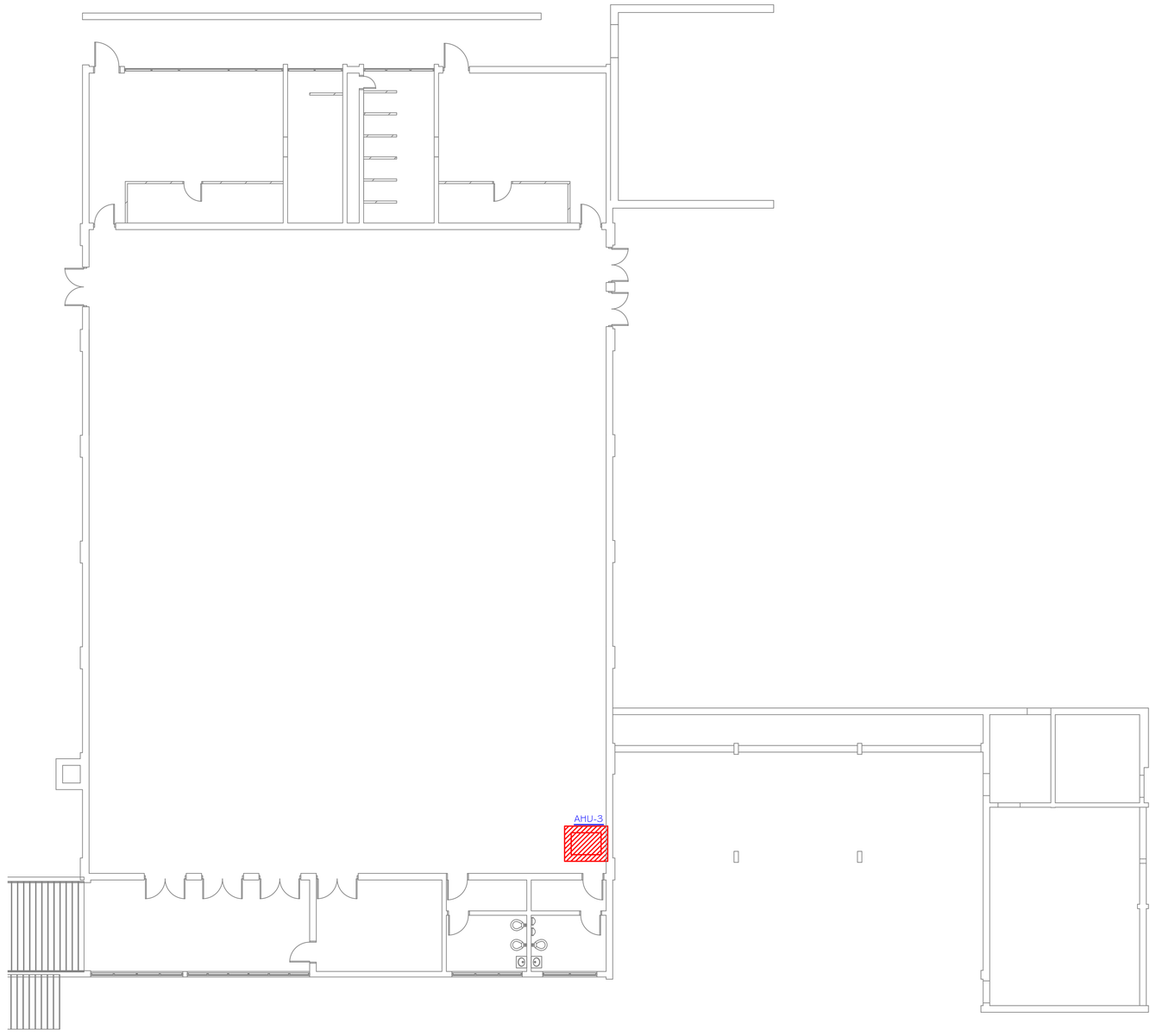
ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
DEMOLITION
PARTIAL PLAN

REVISIONS	DATE
--	--

DRAWN BY: M.HARRISON
APPROVED BY: R.PITTS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

MD1.2



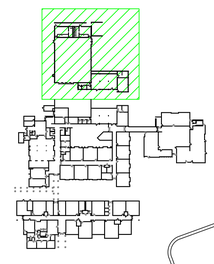
DEMOLITION

PARTIAL – UPPER LEVEL PLAN
GYMNASIUM/LIBRARY
SCALE: 1/8"=1'-0"

N

NOTES:

1. REMOVE A/C UNIT INLET DUCT TRANSITION THRU DISCHARGE DUCT TRANSITION. INCLUDING THE A/C UNIT BELOW GYM FLOOR.
2. REMOVE EXISTING ELECTRICAL FROM A/C UNIT TO DISCONNECT INCLUDING WIRE AND CONDUIT.



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SAMET CORPORATION

R. PITTS 32117 ENGINEER

04/28/2023

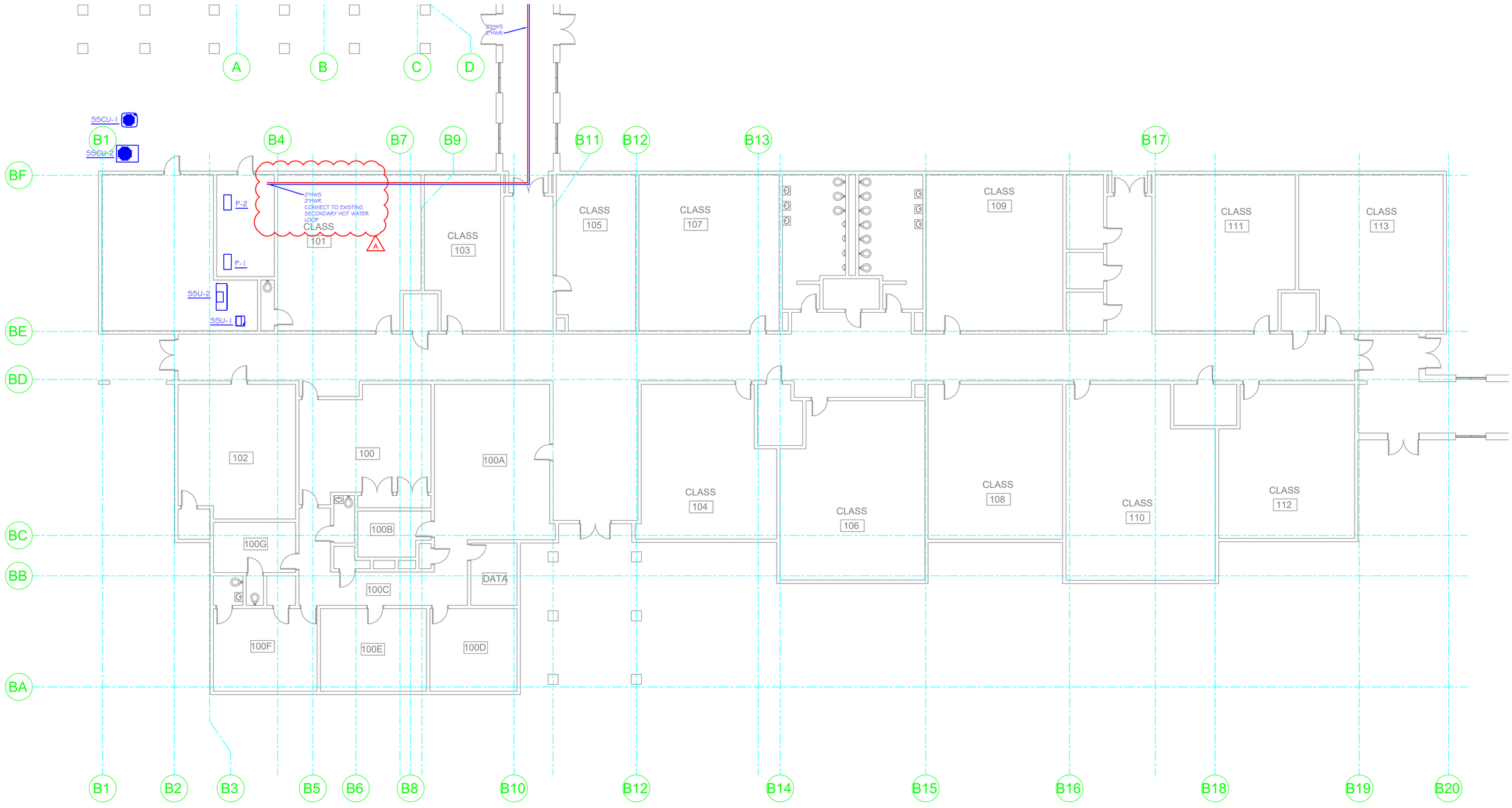
ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL HVAC DEMOLITION PARTIAL PLAN

REVISIONS	DATE
--	--

DRAWN BY: M.HARRISON
APPROVED BY: R.PITTS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

MD1.3

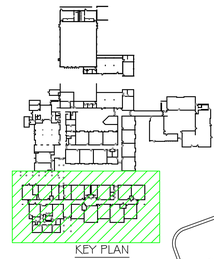


PARTIAL – LOWER LEVEL PLAN
CLASSROOMS
SCALE: 1/8"=1'-0"

N

NOTES:

1. PROVIDE NEW A/C UNIT (PER SCHEDULE), TRANSITIONS AND FLEXIBLE DUCTWORK PER DETAIL.
2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO A/C UNIT. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
3. PROVIDE NEW PUMPS AND ACCESSORIES PER SCHEDULE & DETAIL.
4. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO PUMP. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
5. CONNECT REFRIGERANT LINES TO NEW A/C UNIT. VERIFY SIZES MATCH NEW EQUIPMENT REQUIREMENTS.



KEY PLAN

FOR CONSTRUCTION

Systems Contractors, LLC
Established 1977
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P.O. Box 16023, Greensboro, North Carolina, 27416
Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

CAROLINA PROFESSIONAL ENGINEER SEAL 32717 ENGINEER REGISTERED
04/28/2023

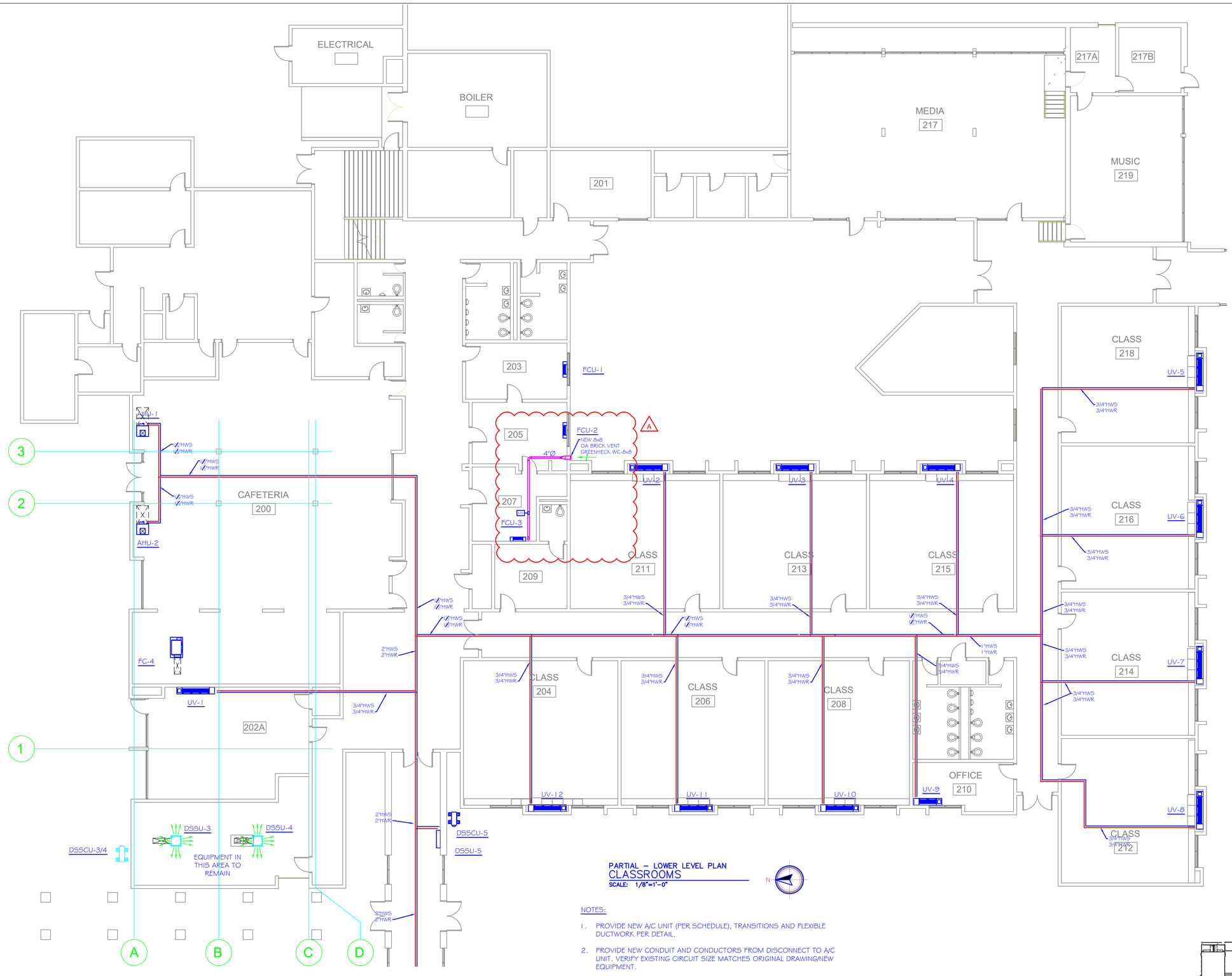
ALAMANCE/BUTLINGTON SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
PARTIAL PLAN

REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

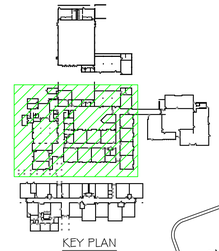
M1.0



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

NOTES:

1. PROVIDE NEW A/C UNIT (PER SCHEDULE), TRANSITIONS AND FLEXIBLE DUCTWORK PER DETAIL.
2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO A/C UNIT. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
3. PROVIDE NEW CHWS/R AND HWS/R PIPING FOR NEW A/C UNIT PER DETAIL.
4. PROVIDE NEW HWS/R PIPING TO NEW UNIT VENTILATORS PER DETAIL.



KEY PLAN

FOR CONSTRUCTION

Systems Contractors, LLC
Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
P.O. Box 16023, Greensboro, North Carolina, 27416
Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

PROFESSIONAL ENGINEER SEAL 32117 ENGINEER
04/28/2023

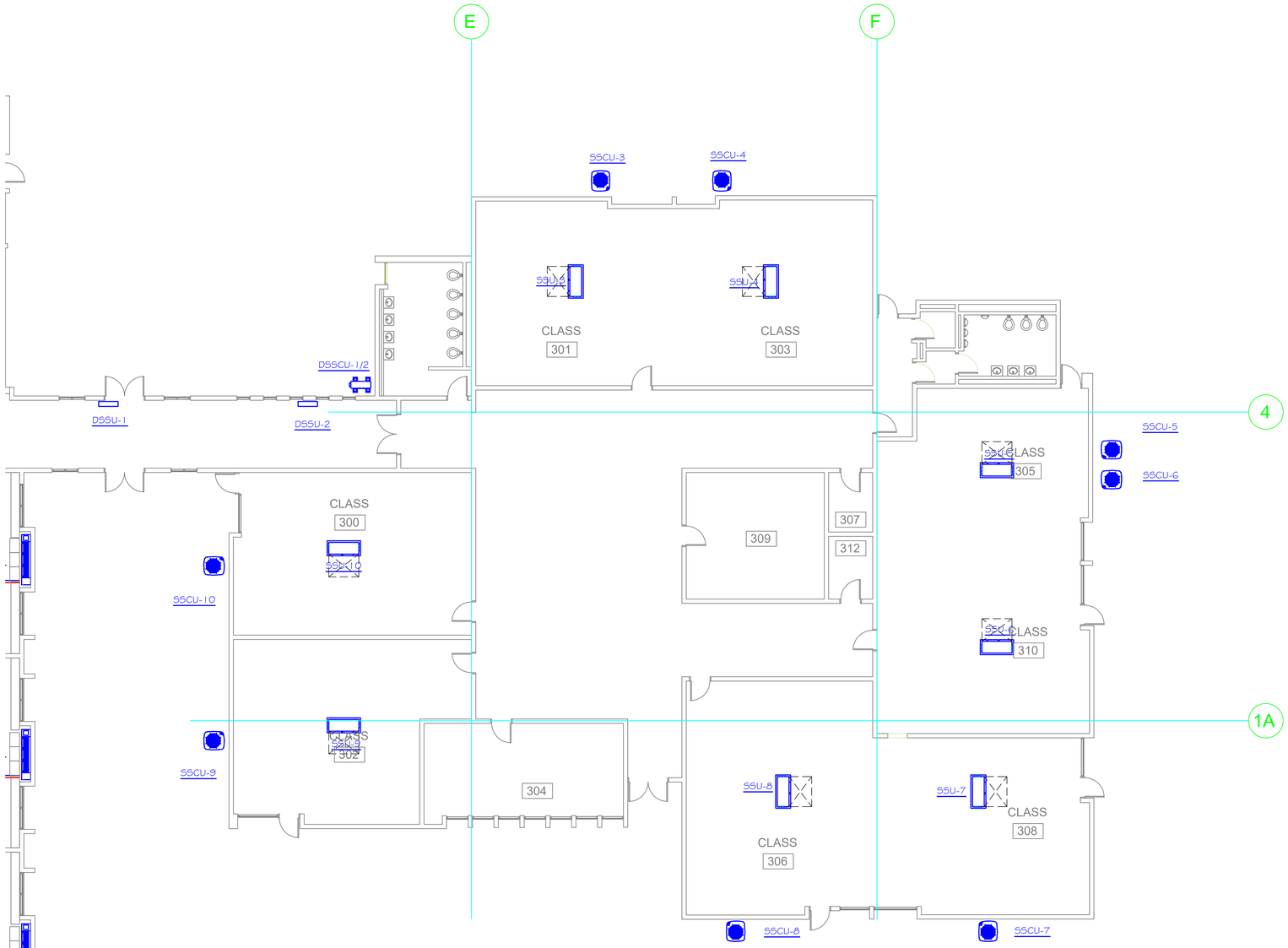
ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
PARTIAL PLAN

REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

M1.1

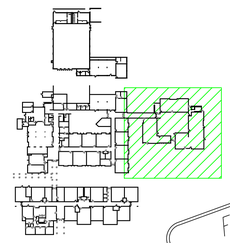


PARTIAL – UPPER LEVEL PLAN
CLASSROOMS
SCALE: 1/8"=1'-0"

N

NOTES:

1. PROVIDE NEW A/C UNIT (PER SCHEDULE), TRANSITIONS AND FLEXIBLE DUCTWORK PER DETAIL.
2. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO A/C UNIT. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.
3. CONNECT REFRIGERANT LINES TO NEW A/C UNIT. VERIFY SIZES MATCH NEW EQUIPMENT REQUIREMENTS.



KEY PLAN

FOR CONSTRUCTION

Systems Contractors, LLC
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SAMET CORPORATION

04/28/2023

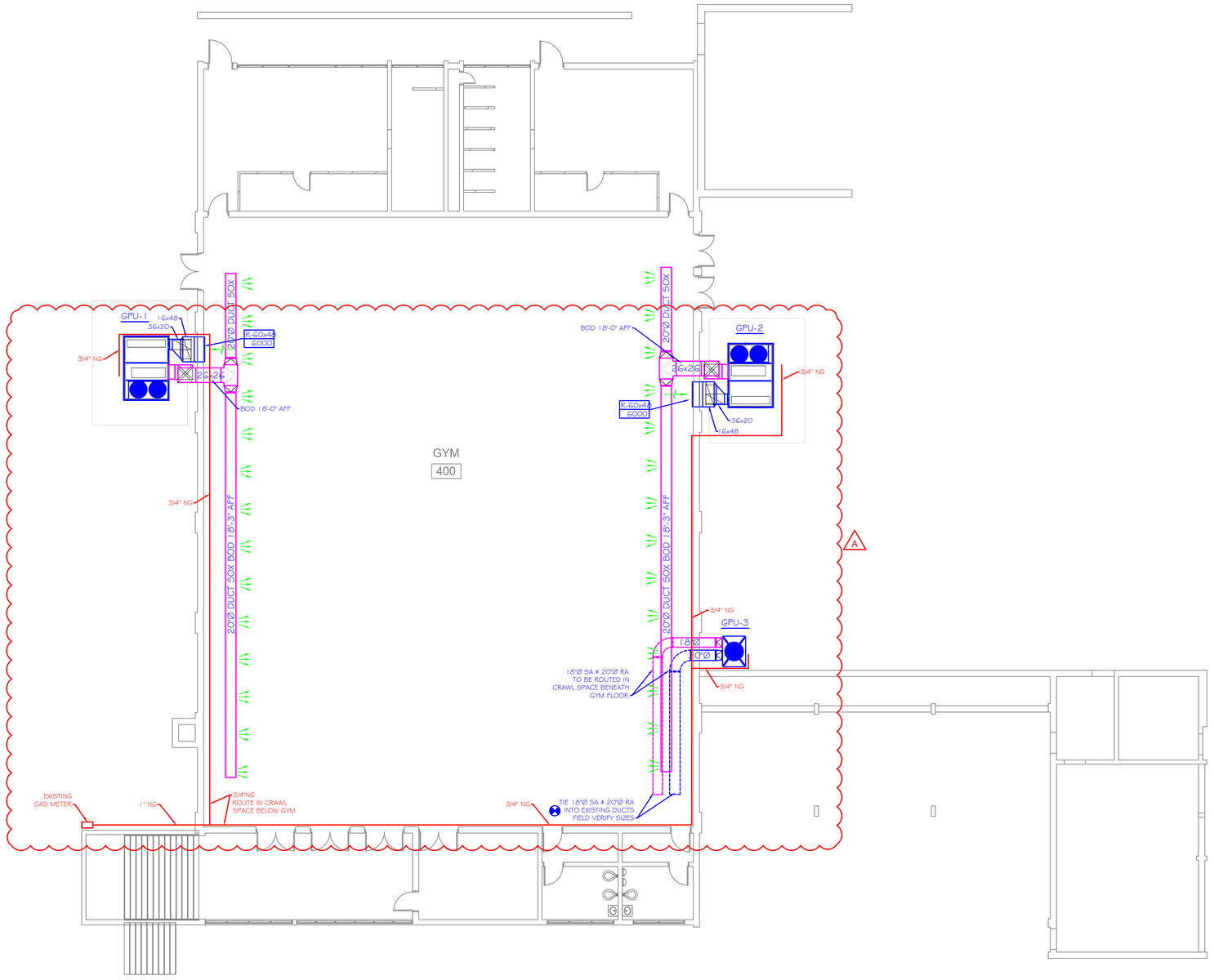
ALAMANCE/BUTLINGTON SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
PARTIAL PLAN

REVISIONS	DATE
--	--

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

M1.2

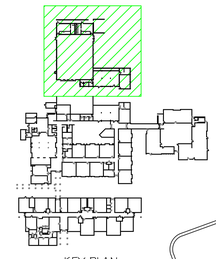


PARTIAL – UPPER LEVEL PLAN
GYMNASIUM/ADMINSTRATIVE
SCALE: 1/8"=1'-0"

N

NOTES:

1. PROVIDE NEW A/C UNIT (PER SCHEDULE).
2. PROVIDE DUCTSOX HANGER PER DETAILS.
3. PROVIDE NEW CONDUIT AND CONDUCTORS FROM DISCONNECT TO A/C UNIT. VERIFY EXISTING CIRCUIT SIZE MATCHES ORIGINAL DRAWING/NEW EQUIPMENT.



KEY PLAN

FOR CONSTRUCTION

Systems Contractors, LLC
Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
P.O. Box 16023, Greensboro, North Carolina, 27416
Telephone 336-763-8969 * Fax 336-449-0297

SAMET CORPORATION

PROFESSIONAL ENGINEER SEAL 32117 ENGINEER KYLE WATERS NORTH CAROLINA

04/28/2023

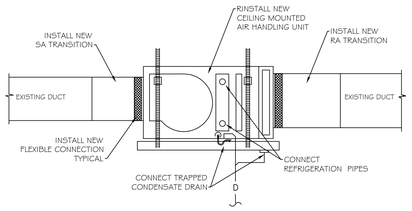
ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
PARTIAL PLAN

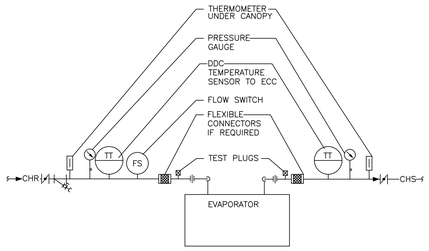
REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
FILE: A-4216_M1.0.DWG
SHEET NUMBER:

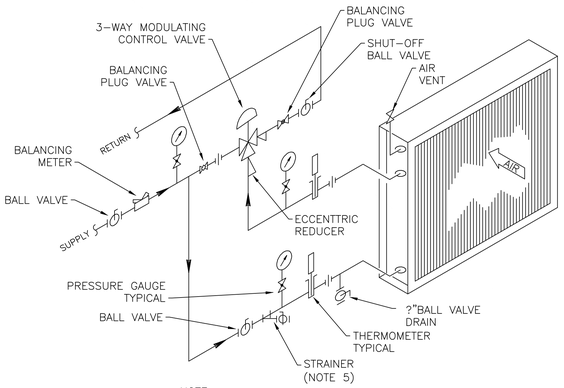
M1.3



1 TYPICAL CEILING MOUNTED AHU DETAIL
NTS

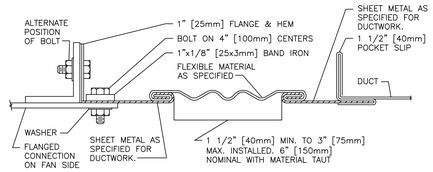


2 AIR COOLED CHILLER - PIPING CONNECTIONS
NTS

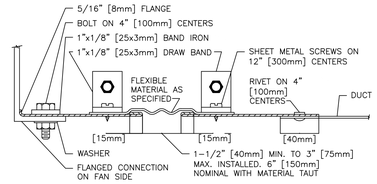


NOTE:
1. WHERE PIPE SIZE IS 2 1/2 " OR SMALLER, PROVIDE BALL VALVE IN LIEU OF BUTTERFLY VALVE.
2. PROVIDE THERMOMETERS AND PRESSURE GAUGES, PER SPECS.
3. INSTALL UNIONS IN PIPE LOCATION OUT OF WAY TO PULL COIL OUT
4. PROVIDE BALANCE METER IN THE SUPPLY PIPE FOR AHU COIL WITH 50 GPM OR MORE
5. PROVIDE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

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

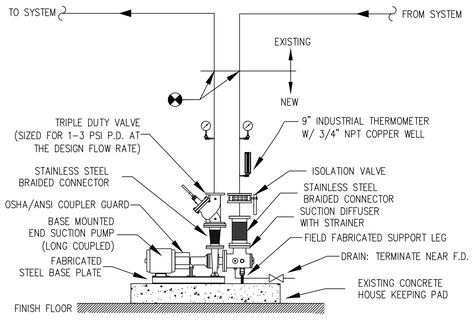


RECTANGULAR FLEXIBLE CONNECTION

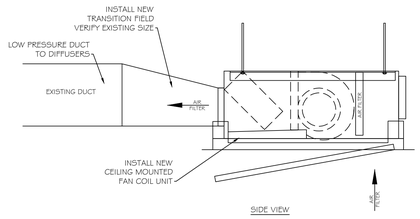


ROUND FLEXIBLE CONNECTION

4 FLEXIBLE CANVAS CONNECTIONS
NTS

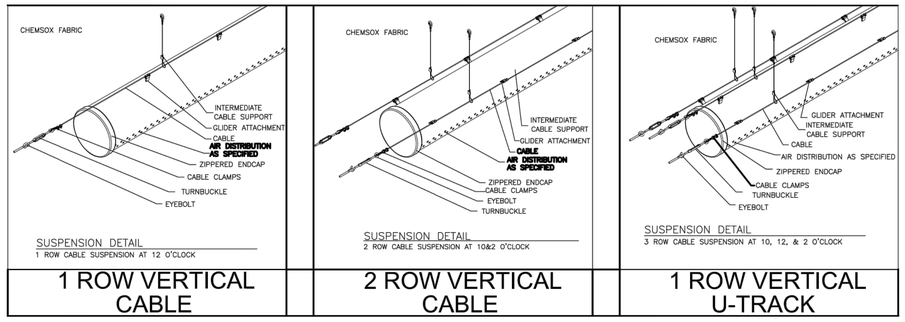


5 END SUCTION PUMP DETAIL - (BASE MOUNTED ON A HOUSEKEEPING PAD)
NTS

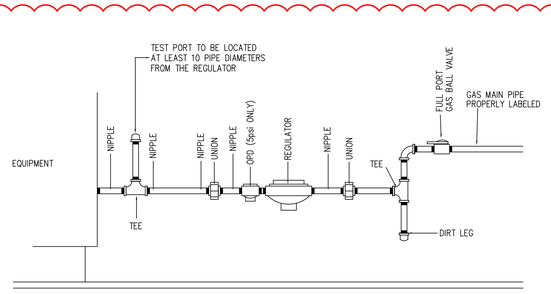


NOTE:
1. RECONNECT LIQ/GAS REFRIGERATION LINES
2. RECONNECT POWER
3. RECONNECT TRAPPED CONDENSATE DRAIN

6 TYPICAL FAN COIL DETAIL
NTS



7 TYPICAL DUCTSOX CABLE HANGER DETAIL
NTS



1.) MUSHROOM STYLE VENT CAPS REQUIRED FOR OUTDOOR INSTALLATION.

2.) PIPING OUTDOORS MUST BE PAINTED.

3.) PIPE SIZE BETWEEN THE REGULATOR AND THE EQUIPMENT MUST BE A MINIMUM OF THE EQUIPMENT CONNECTION SIZE.

4.) ALL PIPING, INCLUDING DIRT LEGS, MUST HAVE 3-1/2"INCHES CLEARANCE FROM THE GROUND, ROOF, ETC..

5.) GAS SHUTOFF VALVE & DIRT LEG MUST BE WITHIN 6'-0" OF THE UNIT.

6.) GAS REGULATOR VENT MUST BE 5'-0" AWAY FROM THE OUTSIDE AIR INTAKE.

7.) GAS REGULATOR VENT MUST BE A MINIMUM 3'-0" AWAY FROM EQUIPMENT COMBUSTION AIR VENT.

A

8 GAS PIPING DETAIL
NTS

Systems Contractors, LLC
Established 1977
Commercial & Industrial HVAC
Custom Air Handling Units * HVAC Service
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ALAMANCE/BUTLINGTON
SCHOOL SYSTEMS
ALTAMAHAW-OSSIPEE MS
2832 N. North Carolina Highway 87, Elon, NC 27244

MECHANICAL
HVAC
DETAILS

REVISIONS	DATE
A REVISED	06/16/23

DRAWN BY: M.HARRISON
APPROVED BY: K.WATERS
DATE: 04/28/2023
PLOT SCALE: 1:1
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SHEET NUMBER:

M1.4

FOR CONSTRUCTION