HVAC NOTES:

1. PROVIDE LABOR, MATERIALS, TOOLS, MACHINERY, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE THE HVAC WORK UNDER THIS CONTRACT. ALL SYSTEMS AND EQUIPMENT SHALL BE COMPLETE IN EVERY ASPECT AND ALL ITEMS OF MATERIAL, EQUIPMENT AND LABOR SHALL BE PROVIDED FOR A FULLY OPERATIONAL SYSTEM AND READY FOR USE. COORDINATE THE WORK WITH THE WORK OF THE OTHER SUBCONTRACTORS IN ORDER TO RESOLVE ALL CONFLICTS WITHOUT IMPEDING THE JOB PROGRESS.
2. EXAMINE THE ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS AND OTHER DIVISIONS, AND SECTIONS OF THE SPECIFICATIONS IN ORDER TO DETERMINE THE EXTENT OF THE WORK REQUIRED TO BE COMPLETED UNDER THIS DIVISION. FAILURE TO EXAMINE ALL THE CONTRACT DOCUMENTS FOR THIS PROJECT WILL NOT RELIEVE THIS CONTRACTOR OF HIS RESPONSIBILITIES TO PERFORM THE WORK REQUIRED FOR A COMPLETE FULLY OPERATIONAL AND SATISFACTORY INSTALLATION.
3. THE WORK INCLUDES BUT IS NOT LIMITED TO THE DEPICTED SYSTEMS, EQUIPMENT AND SERVICES, AS SPECIFIED HEREIN.
4. START-UP SERVICES SHALL BE INCLUDED.
5. ALL SYSTEMS, EQUIPMENT AND SERVICES SPECIFIED HEREIN SHALL BE PROVIDED COMPLETE AND READY FOR USE. ALL EQUIPMENT, DUCTWORK, PIPING, DAMPERS, OUTLETS ARE NEW, FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE NOTED.
6. DUCTWORK AND PIPING ARE SHOWN DIAGRAMMATICALLY AND DO NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ENGINEER. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER SUBCONTRACTORS IS REQUIRED. PROVIDE COORDINATION DRAWINGS SHOWING ALL TRADES WORK AND EXISTING CONDITION.
7. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES INVOLVING EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
8. VERIFY FINAL LOCATIONS FOR ROUGH WORK WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT BEING CONNECTED.
9. PROVIDE A COMPLETE SYSTEM OF VIBRATION ISOLATION FOR EACH ITEM OF HVAC EQUIPMENT AND APPARATUS AS SPECIFIED HEREIN, AS SHOWN ON THE DRAWINGS AND AS NEEDED FOR A COMPLETE AND PROPER INSTALLATION.
10. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACE AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER IN THE INTERIOR OR THE EXTERIOR.
11. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY NYPL, OR AS NOTED TO BE RELOCATED ON THE DRAWINGS, AND SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.
12. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
13. ALL CONTROL WIRING SHALL BE DONE BY MECHANICAL CONTRACTOR, IN ACCORDANCE WITH SEQUENCE OF OPERATION, AS SPECIFIED, AND IN ACCORDANCE WITH MANUFACTURER'S CONTROL DATA.
14. CONTRACTOR IS RESPONSIBLE TO ATTEND COORDINATION MEETING WITH ALL TRADES TO DETERMINE LOCATIONS OF DEVICES AND DISCOVER IF ANY CONFLICTS MAY EXIST.
15. ALL PIPING EXPOSED OR INSULATED, DUCTWORK, CONDUIT AND CONTROL WIRING SHALL BE CONCEALED IN CEILINGS, WALLS AND FLOORS OR CONCEALED IN NEW SOFFITS OR FRAMED ENCLOSURES.

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS AND COORDINATE THE WORK WITH OTHER TRADES.
2. THE FULL DEMOLITION SCOPE IS NOT SPECIFICALLY SHOWN ON THE DRAWINGS. PROVIDE DEMOLITION WORK CONSIDERED NECESSARY FOR THE COMPLETION OF THE WORK. SURVEY THE PREMISES TO ACCURATELY DETERMINE THE FULL SCOPE OF THE REMOVAL AND DISPOSAL WORK. NO ADDITIONAL PAYMENTS WILL BE MADE DUE TO CONTRACTOR'S FAILURE TO ADEQUATELY SURVEY THE PREMISES.
3. CONTRACTOR TO REMOVE AND PROPERLY DISPOSE OF EQUIPMENT FROM SITE INDICATED FOR DEMOLITION, UNLESS OTHERWISE DIRECTED BY THE AUTHORITY.
4. THE MECHANICAL CONTRACTOR SHALL PROVIDE POWER SUPPLIES, ELECTRICAL WIRING AND CONDUIT FOR POWER AND CONTROL TO PNEUMATIC OR MOTORIZED DAMPER AND VALVE OPERATORS, THERMOSTATS, AUTOMATIC CONTROL INSTRUMENTATION. COORDINATE WITH THE ELECTRICAL CONTRACTOR TO PROVIDE A COMPLETE AND FUNCTIONAL SYSTEM.
5. FOR POWERED EQUIPMENT INTENDED FOR DEMOLITION, THE CONTRACTOR SHALL COORDINATE SHUT-OFF POWER SUPPLIES AND DISCONNECT SWITCHES ASSOCIATED WITH THE EQUIPMENT TO BE DISCONNECTED. RECONNECT ELECTRICAL POWER TO NEW EQUIPMENT AFTER INSTALLATION. PROVIDE ELECTRICAL MATERIAL AND LABOR AS REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
6. TEMPORARY SHUTDOWNS OF SERVICE OF EXISTING ELECTRICAL, STEAM, HEATING, AIR CONDITIONING AND VENTILATION SYSTEMS SHALL BE PERFORMED WITH A MINIMUM OF DISRUPTION OF SERVICE, HELD TO AN ABSOLUTE MINIMUM DURATION OF TIME, AND ONLY AFTER HAVING NOTIFIED THE BUILDING OPERATIONS MANAGEMENT AT LEAST TWO WEEKS IN ADVANCE AND HAVING RECEIVED THEIR PERMISSION IN WRITING, AT LEAST TWO WEEKS PRIOR TO THE SCHEDULED SHUTDOWN. COMMUNICATIONS SHALL BE RELAYED THROUGH THE OWNER'S REPRESENTATIVE.
7. PROVIDE MOTOR STARTERS AS REQUIRED FOR MECHANICAL EQUIPMENT.
8. LOAD CALCULATIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS, SPECIFICALLY ASHRAE HANDBOOK - FUNDAMENTALS.
10. CONTRACTOR SHALL PERFORM ALL TESTS AND STARTUP PROCEDURES FOR EACH VENTILATION SYSTEM IN ACCORDANCE WITH THE MANUFACTURER AND SPECIFICATIONS.
11. ALL THERMOSTATIC CONTROLS SHALL BE TESTED FOR FUNCTIONALITY AND PROPER OPERATION AS REQUIRED BY NYS ECC.
12. ELECTRIC MOTORS SHALL COMPLY WITH THE REQUIREMENTS OF THE ENERGY POLICY ACT OF 1992 AS SHOWN IN ASHRAE 90.1-2013 TABLE #10.8.
13. PROVIDE EQUIPMENT MAINTENANCE MANUALS AND REQUIRED EQUIPMENT LABELS FOR ALL NEW MECHANICAL, ELECTRICAL AND SERVICE HOT WATER HEATING EQUIPMENT.
14. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO PROVIDE CONTROL WIRING. THE MECHANICAL CONTRACTOR SHALL ALSO PROVIDE ALL POWER SUPPLIES, ELECTRICAL WIRING AND CONDUIT FOR POWER AND CONTROL TO ALL VALVE OPERATORS, THERMOSTATS AND AUTOMATIC CONTROL INSTRUMENTATION. ELECTRICAL CONTRACTOR TO INSTALL AND ROUTE POWER WIRING FOR EACH MECHANICAL SYSTEM.
15. MOUNTING HEIGHTS FOR ASSOCIATED MECHANICAL THERMOSTAT CONTROLS, ETC. SHALL MEET THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES. MOUNTING HEIGHTS FOR ALL THERMOSTATS, ETC SHALL BE 48" AFF.
16. PATCH AND REPAIR EXISTING VCT FLOORING AT UNIT VENTILATORS TO REPAIR ANY DAMAGE CAUSED BY THE WORK OR AS NECESSARY COMPENSATE FOR ANY DIFFERENCE IN THE SIZE OF THE CASING BETWEEN THE NEW AND EXISTING UNIT VENTILATORS.

MECHANICAL BALANCING NOTE

AT THE PROJECT INCEPTION THE CONTRACTOR SHALL RETAIN THE SERVICES OF A CERTIFIED TESTING AND BALANCING FIRM TO TEST AND DOCUMENT THE FOLLOWING PERFORMANCE DATA OF THE EXISTING EQUIPMENT DESIGNATED TO BE REMOVED, REUSED OR REPLACED AS PART OF THE SCOPE OF THIS PROJECT. THE TESTING AND DOCUMENTATION SHALL INCLUDE AS A MINIMUM:

AIR FLOW PERFORMANCE OF ALL FANS, OUTSIDE, SUPPLY, EXHAUST, RETURN, AIR HANDLERS, INCLUDING SUCTION AND DISCHARGE STATIC PRESSURE AND OPERATING TEMPERATURE DIFFERENCE AIR FLOW PERFORMANCE OF ALL UNIT VENTILATORS, CABINET UNIT HEATERS, FAN COILS, CHILLED AND HIGH TEMPERATURE HOT WATER FLOW AT EACH CHILLER, AIR HANDLER COIL, CABINET UNIT HEATER, CHILLED AND HIGH TEMPERATURE HOT WATER CIRCULATING PUMPS, HEAT EXCHANGERS, INCLUDING WATER SIDE ENTERING AND LEAVING PRESSURE DROP.

ABBREVIATIONS

ABBREVIATION:	DESCRIPTION:
A	AMPERE
AC	AIR CONDITIONING
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHRI	AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AMP	AMPERE
AO	ANALOG OUTPUT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AUX	AUXILIARY
AVG	AVERAGE
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BMS	BUILDING MANAGEMENT SYSTEM
BTU	BRITISH THERMAL UNIT
C	CONDENSATE LINE
CAP	CAPACITY
CD	CONDENSATE DRAIN
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON, CUBIC INCHES
CO	CLEANOUT
CONC	CONCRETE
COP	COEFFICIENT OF PERFORMANCE
CW	COLD WATER
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	DRAIN, DEPTH
DB	DECIBELS
DB	DRY BULB
DBA	DECIBELS (A WEIGHTED)
DDC	DIRECT DIGITAL CONTROL
DEG, °	DEGREES
Ø	DIAMETER/ROUND
DI	DIGITAL INPUT
DN	DOWN
DO	DIGITAL OUTPUT
DP	DEW POINT
DR	DRAIN
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
EX.	EXISTING
F	FAHRENHEIT
FA	FIRE ALARM
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FD	FLOOR DRAIN
FF	FINISHED FLOOR
FG	FINISHED GRADE
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FSD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET
FTR	FINNED TUBE RADIATOR
FU	FIXTURE UNIT
G	NATURAL GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	HOUR, HEIGHT
H2O	WATER
HD	HEAD
HG	MERCURY
HOA	HAND/OFF/AUTO
HP	HEAT PUMP
HR	HOUR
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HZ	HERTZ
ID	INSIDE DIAMETER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
IN	INCHES
IPLV	INTEGRATED PART LOAD VALUE
ISCOP	INTEGRATED SEASONAL COEFFICIENT OF PERFORMANCE
ISMRE	INTEGRATE SEASONAL MOISTURE REMOVAL EFFICIENCY
KW	KILOWATTS
LxWxH	LENGTH BY WIDTH BY HEIGHT
LAT	LEAVING AIR TEMPERATURE
LB	POUND
LEV	LINEAR EXPANSION VALVE
LF	LINEAR FEET
LH	LEFT HAND
LRA	LOCKED ROTOR AMPS
LWT	LEAVING WATER TEMPERATURE
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	1,000 BTU/H
MCA	MINIMUM CIRCUIT AMPACITY
MCDB	MEAN COINCIDENT DRY BULB
MCWB	MEAN COINCIDENT WET BULB
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM, MINUTE
MM	MILLIMETER
MOP	MAXIMUM OVER-CURRENT PROTECTION
NPSHA	NET POSITIVE SUCTION HEAD (ACTUAL)
NPSHR	NET POSITIVE SUCTION HEAD (REQUIRED)
OAT	OUTSIDE AIR TEMPERATURE
OC	ON CENTER
OD	OUTSIDE DIAMETER
ODP	OPEN DRIP-PROOF
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NK	NECK
NO	NORMALLY OPEN
NR	NOT REQUIRED
NTS	NOT TO SCALE
PC	PUMPED CONDENSATE
PD	PUMP DISCHARGE, PRESSURE DROP
PH	PHASE
PRESS	PRESSURE
PSIA	POUNDS PER SQUARE INCH, ABSOLUTE
PSIG	POUNDS PER SQUARE INCH, GAUGE
QTY	QUANTITY
R	REFRIGERANT
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RD	ROOF DRAIN
REQD	REQUIRED
REV	REVISION
RH	RELATIVE HUMIDITY, RIGHT HAND
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPERES
RM	ROOM
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
S	SECONDS
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SENS	SENSIBLE
SF	SQUARE FEET
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SZVAV	SINGLE ZONE VARIABLE VOLUME
TB	TO BOTTOM
TDH	TOTAL DYNAMIC HEAD
TEFC	TOTALLY ENCLOSED, FAN COOLED
TEMP	TEMPERATURE
THK	THICK
TOD	TOP OF DUCT
TON	12,000 BTU/H COOLING CAPACITY
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VENT, VOLTS, OR VOLUME
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
VRF	VARIABLE REFRIGERANT FLOW
W	WATTS, WIDTH
W/	WITH
WB	WET BULB
WC	WATER COLUMN

HVAC DESIGN CRITERIA

A. SITE (BASED ON NEAREST AVAILABLE DATA: ASHRAE 2013 HANDBOOK CLIMATIC DESIGN INFORMATION, WESTCHESTER CO, NY):
   1. 41.07°N, 73.71°W
   2. ELEVATION: 397 FT
   3. CLIMATE ZONE 5A.

B. OUTSIDE DESIGN CONDITIONS (BASED ON NEAREST AVAILABLE DATA: ASHRAE 2013 CLIMATIC DESIGN INFORMATION, WESTCHESTER CO, NY):
   1. HEATING DB (99.6%): 9.0°F DB
   2. COOLING DB/MCWB (1%): 86.5°F DB, 72.1°F WB

C. INSIDE DESIGN CONDITIONS (PER NYSED MANUAL OF PLANNING STANDARDS S602-6 B. AND 2015 ASHRAE HANDBOOK CH 7 TABLE 6):
   1. HEATING INDOOR SETPOINT: 72°F
   2. COOLING INDOOR SETPOINT: 78°F, 60% RH

D. ACOUSTICS (PER NYSED MANUAL OF PLANNING STANDARDS, TABLE S304-1):
   1. DESIGN REQUIREMENTS FOR HVAC SYSTEM NOISE FOR CLASSROOMS, 7-12: RC 25-30.

E. FILTRATION: MERV 13 (PER NYSED MANUAL OF PLANNING STANDARDS).

F. DEMAND CONTROLLED VENTILATION NOT REQUIRED PER ECCNYS C403.2.6.1 EXCEPTION #3.

SUMMARY OF WORK:

THE WORK OF THIS PROJECT INCLUDES HVAC UPGRADES AT WILLOW GROVE ELEMENTARY SCHOOL. PROVIDE MATERIALS AND SERVICES AS FOLLOWS. THE FOLLOWING IS NOT INTENDED TO BE A COMPLETE DESCRIPTION OF THE WORK; PERFORM THE WORK AS HEREINAFTER DESCRIBED IN THESE CONTRACT DOCUMENTS.

A. REPLACE UNIT VENTILATORS THROUGHOUT THE BUILDING WHERE INDICATED. CONNECT ALL UNIT VENTILATORS TO THE NEW VRF SYSTEM WITH NEWLY INSTALLED REFRIGERANT PIPING.
B. PROVIDE FOUR (4) NEW DUCTLESS VRF OUTDOOR CONDENSING UNITS.
C. PROVIDE TWO (2) NEW HEAT PUMP ROOF TOP UNITS TO SUPPLY THE GYMNASIUMS.

SEQUENCE OF OPERATIONS

A. UNIT VENTILATORS:
1. COOLING OCCUPIED MODE: SUPPLY FANS SHALL BE ON, OA DAMPER SHALL BE AT MINIMUM POSITION, AND THE CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.
2. COOLING UNOCCUPIED MODE: THE UNIT SHALL BE OFF AND THE OA DAMPER SHALL BE CLOSED.
3. HEATING OCCUPIED MODE: SUPPLY FANS SHALL BE ON, OA DAMPER SHALL BE AT MINIMUM POSITION, THE CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.
4. HEATING UNOCCUPIED MODE: THE OA DAMPER SHALL BE CLOSED AND THE CONTROL VALVE SHALL BE WIDE OPEN. THE SUPPLY FANS AND CONTROL VALVE SHALL CYCLE TO MAINTAIN SPACE TEMPERATURE AT THE NIGHT SETBACK VALUE.
5. ECONOMIZER MODE: THE OA DAMPER SHALL MODULATE FROM MINIMUM TO MAXIMUM POSITIONS BASED ON A FIXED DRY-BULB TEMPERATURE. THE CONTROL VALVE SHALL BE CLOSED.
6. AUTOMATIC FAN SPEED ADJUSTMENT (LOW ACOUSTIC OPTION): THE SUPPLY FANS SHALL BE DRIVEN BY ELECTRONICALLY COMMUTATED MOTORS (ECM) WHICH SHALL REDUCE THE FAN SPEED AT PART LOAD CONDITIONS TO REDUCE NOISE. THE OA DAMPER SHALL ALSO ADJUST ITS MINIMUM POSITION TO ENSURE ADEQUATE VENTILATION.
7. MORNING WARM-UP/COOL-DOWN: THE UNIT SHALL AUTOMATICALLY WARM-UP/COOL-DOWN THE SPACE PRIOR TO OCCUPANCY BASED ON THE PROGRAMMABLE SCHEDULE.
8. BUILDING MANAGEMENT SYSTEM (BMS): EACH UNIT VENTILATOR INCLUDING DAMPER, CONTROL VALVES, THERMOSTATS, AND APPURTENANCES SHALL BE INTEGRATED WITH THE EXISTING SIEMENS BMS.

SYMBOLS:

- CENTER LINE
- DEMOLITION AND REMOVAL
- EXISTING TO REMAIN
- NEW PIPE, DUCTWORK OR EQUIPMENT
- PIPE DROPPING DOWN
- PIPE RISING UP
- AIR VENT
- AUTOMATIC FLOW CONTROL VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CONCENTRIC REDUCER OR INCREASER
- ECCENTRIC REDUCER OR INCREASER
- FLEXIBLE CONNECTOR
- FLOW IN DIRECTION OF ARROW
- GATE VALVE
- GLOBE VALVE
- MODULATING CONTROL VALVE
- PRESSURE GAUGE WITH NEEDLE VALVE COCK
- PRESSURE REDUCING VALVE
- PRESSURE RELIEF VALVE
- STRAINER
- THERMOMETER
- TRIPLE DUTY VALVE
- UNION
- DISCONNECT POINT
- TIE-IN POINT
- CHWS — CHILLED WATER SUPPLY (CHWS)
- CHWR — CHILLED WATER RETURN (CHWR)
- CWR — CONDENSER WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- HWR — HOT WATER RETURN
- HWS — HOT WATER SUPPLY
- REFRIGERANT
- D — DRAIN
- MU — MAKE-UP WATER
- V — VENT
- T — TEMPERATURE SENSOR/THERMOSTAT
- H — HUMIDITY SENSOR
- VD — VOLUME DAMPER
- SUPPLY DIFFUSER
- RETURN OR EXHAUST GRILLE
- DEMOLISH
- A — SECTION A-A

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

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Drawing Title
MECHANICAL GENERAL NOTES, ABBREVIATIONS, & SYMBOL LIST

Drawing No.
FES-M-001

MECHANICAL VENTILATION SCHEDULE

ROOM	OCCUPANY CLASSIFICATION	FLOOR AREA (FT^2)	ROOM VOLUME (FT^3)	OCCUPANT LOAD (OCCUPANT/1,000 FT^2)	# OF OCCUPANTS	REQUIRED CFM/OCCUPANT	REQUIRED CFM/FT^2	BREATHING ZONE OUTDOOR AIRFLOW (CFM)	ZONE DISTRIBUTION EFFECTIVENESS		TOTAL ROOM OUTDOOR AIR REQUIRED (CFM)		ACTUAL ROOM OUTDOOR AIRFLOW RATE (CFM)		TOTAL SUPPLY AIRFLOW (CFM)		AIR CHANGE RATE (ACH)	
									COOLING	HEATING	COOLING	HEATING	COOLING	HEATING	COOLING	HEATING	COOLING	HEATING
BAND ROOM 101	MUSIC/THEATER/DANCE	1102	12122	35	39	10	0.06	452	0.9	0.9	502	502	505	505	1500	1500	7.4	7.4
CHORUS 103	MUSIC/THEATER/DANCE	947	10417	35	33	10	0.06	388	0.9	0.9	431	431	435	435	1250	1250	7.2	7.2
WEIGHT ROOM 105	WEIGHT ROOM	388	4268	10	4	20	0.06	101	0.9	0.9	112	112	115	115	750	750	10.5	10.5
OFFICE 106	OFFICE SPACES	347	3817	5	2	5	0.06	29	0.9	0.9	33	33	35	35	750	750	11.8	11.8
SHOP 107	WOOD/METAL SHOPS	1790	19690	20	36	10	0.18	680	0.9	0.9	756	756	760	760	2500	2500	7.6	7.6
SHOP 108	WOOD/METAL SHOPS	1786	19646	20	36	10	0.18	679	0.9	0.9	754	754	755	755	2500	2500	7.6	7.6
CLASSROOM 112	CLASSROOMS (AGE 9 PLUS)	833	9163	35	29	10	0.12	392	0.9	0.9	435	435	440	440	1250	1250	8.2	8.2
CLASSROOM 113	CLASSROOMS (AGE 9 PLUS)	837	9207	35	29	10	0.12	393	0.9	0.9	437	437	440	440	1500	1500	9.8	9.8
RES 114	CLASSROOMS (AGE 9 PLUS)	833	9163	35	29	10	0.12	392	0.9	0.9	435	435	440	440	1250	1250	8.2	8.2
CLASSROOM 115	CLASSROOMS (AGE 9 PLUS)	858	9438	35	30	10	0.12	403	0.9	0.9	448	448	450	450	1500	1500	9.5	9.5
SPECIAL ED 116	CLASSROOMS (AGE 9 PLUS)	835	9185	35	29	10	0.12	392	0.9	0.9	436	436	440	440	1250	1250	8.2	8.2
CLASSROOM 117	CLASSROOMS (AGE 9 PLUS)	845	9295	35	30	10	0.12	397	0.9	0.9	441	441	445	445	1500	1500	9.7	
SPECIAL ED 118	CLASSROOMS (AGE 9 PLUS)	840	9240	35	29	10	0.12	395	0.9	0.9	439	439	440	440	1250	1250	8.1	8.1
OFFICE 121	OFFICE SPACES	504	5544	5	3	5	0.06	43	0.9	0.9	48	48	50	50	750	750	8.1	8.1
NURSE 122	OFFICE SPACES	584	6424	5	3	5	0.06	50	0.9	0.9	55	55	60	60	1000	1000	9.3	9.3
LOUNGE 123	OFFICE SPACES	806	8866	5	4	5	0.06	69	0.9	0.9	76	76	80	80	750	750	5.1	5.1
CLASSROM 124	CLASSROOMS (AGE 9 PLUS)	579	6369	35	20	10	0.12	272	0.9	0.9	302	302	305	305	750	750	7.1	7.1
CLASSROOM 125	CLASSROOMS (AGE 9 PLUS)	807	8877	35	28	10	0.12	379	0.9	0.9	421	421	425	425	1250	1250	8.4	8.4
CLASSROOM 127	CLASSROOMS (AGE 9 PLUS)	783	8613	35	27	10	0.12	368	0.9	0.9	409	409	410	410	1250	1250	8.7	8.7
CLASSROOM 129	CLASSROOMS (AGE 9 PLUS)	812	8932	35	28	10	0.12	382	0.9	0.9	424	424	425	425	1250	1250	8.4	8.4
CLASSROOM 130	CLASSROOMS (AGE 9 PLUS)	811	8921	35	28	10	0.12	381	0.9	0.9	424	424	425	425	1250	1250	8.4	8.4
CLASSROOM 132	CLASSROOMS (AGE 9 PLUS)	812	8932	35	28	10	0.12	382	0.9	0.9	424	424	425	425	1250	1250	8.4	8.4
CLASSROOM 133	CLASSROOMS (AGE 9 PLUS)	815	8965	35	29	10	0.12	383	0.9	0.9	426	426	430	430	1500	1500	10.0	10.0
CLASSROOM 134	CLASSROOMS (AGE 9 PLUS)	812	8932	35	28	10	0.12	382	0.9	0.9	424	424	425	425	1250	1250	8.4	8.4
CLASSROOM 135	CLASSROOMS (AGE 9 PLUS)	815	8965	35	29	10	0.12	383	0.9	0.9	426	426	430	430	1500	1500	10.0	10.0
CLASSROOM 136	CLASSROOMS (AGE 9 PLUS)	812	8932	35	28	10	0.12	382	0.9	0.9	424	424	425	425	1000	1000	6.7	6.7
CLASSROOM 137	CLASSROOMS (AGE 9 PLUS)	815	8965	35	29	10	0.12	383	0.9	0.9	426	426	430	430	1500	1500	10.0	10.0
ART ROOM 138	CLASSROOMS (AGE 9 PLUS)	482	5302	35	17	10	0.12	227	0.9	0.9	252	252	255	255	1000	1000	11.3	11.3
STORAGE 138A	CLASSROOMS (AGE 9 PLUS)	512	5632	35	18	10	0.12	241	0.9	0.9	267	267	270	270	750	750	8.0	8.0
ART ROOM 139	CLASSROOMS (AGE 9 PLUS)	892	9812	35	31	10	0.12	419	0.9	0.9	466	466	470	470	1250	1250	7.6	7.6
ART ROOM 140	CLASSROOMS (AGE 9 PLUS)	846	9306	35	30	10	0.12	398	0.9	0.9	442	442	445	445	1000	1000	6.4	6.4
CLASSROOM 141	CLASSROOMS (AGE 9 PLUS)	830	9130	35	29	10	0.12	390	0.9	0.9	433	433	435	435	1000	1000	6.6	6.6
SCIENCE 142	CLASSROOMS (AGE 9 PLUS)	894	9834	35	31	10	0.12	420	0.9	0.9	467	467	470	470	1250	1250	7.6	7.6
SCIENCE 144	CLASSROOMS (AGE 9 PLUS)	785	8635	35	27	10	0.12	369	0.9	0.9	410	410	410	410	1000	1000	6.9	6.9
LIBRARY 145	LIBRARIES	1948	21428	10	19	5	0.12	331	0.9	0.9	368	368	370	370	1500	1500	4.2	4.2
HOME EC 146	CLASSROOMS (AGE 9 PLUS)	786	8646	35	28	10	0.12	369	0.9	0.9	410	410	415	415	1250	1250	8.7	8.7
CLASSROOM 148	CLASSROOMS (AGE 9 PLUS)	552	6072	35	19	10	0.12	259	0.9	0.9	288	288	290	290	1000	1000	9.9	9.9
HOME EC 150	CLASSROOMS (AGE 9 PLUS)	797	8767	35	28	10	0.12	375	0.9	0.9	416	416	420	420	1000	1000	6.8	6.8
CLASSROOM 151	CLASSROOMS (AGE 9 PLUS)	566	6226	35	20	10	0.12	266	0.9	0.9	296	296	300	300	1000	1000	9.6	9.6
OFFICE 152	OFFICE SPACES	235	2585	5	1	5	0.06	20	0.9	0.9	22	22	25	25	750	750	17.4	17.4
WORK ROOM 153	CLASSROOMS (AGE 9 PLUS)	515	5665	35	18	10	0.12	242	0.9	0.9	269	269	270	270	750	750	7.9	7.9
CLASSROOM 154	CLASSROOMS (AGE 9 PLUS)	623	6853	35	22	10	0.12	293	0.9	0.9	325	325	330	330	1000	1000	8.8	8.8
CLASSROOM 202	CLASSROOMS (AGE 9 PLUS)	827	9097	35	29	10	0.12	389	0.9	0.9	432	432	435	435	1250	1250	8.2	8.2
CLASSROOM 203	CLASSROOMS (AGE 9 PLUS)	789	8679	35	28	10	0.12	371	0.9	0.9	412	412	415	415	1500	1500	10.4	10.4
COMPUTER ROOM 204	COMPUTER LAB	791	8701	25	20	10	0.12	293	0.9	0.9	325	325	330	330	750	750	5.2	5.2
OFFICE 205	OFFICE SPACES	289	3179	5	1	5	0.06	25	0.9	0.9	27	27	30	30	750	750	14.2	14.2
COMPUTER ROOM 206	COMPUTER LAB	791	8701	25	20	10	0.12	293	0.9	0.9	325	325	330	330	750	750	5.2	5.2
CLASSROOM 207	CLASSROOMS (AGE 9 PLUS)	783	8613	35	27	10	0.12	368	0.9	0.9	409	409	410	410	1500	1500	10.4	10.4
BIOLOGY 208	CLASSROOMS (AGE 9 PLUS)	930	10230	35	33	10	0.12	437	0.9	0.9	486	486	490	490	1500	1500	8.8	8.8
CLASSROOM 209	CLASSROOMS (AGE 9 PLUS)	792	8712	35	28	10	0.12	372	0.9	0.9	414	414	415	415	1500	1500	10.3	10.3
GENERAL SCIENCE 210	CLASSROOMS (AGE 9 PLUS)	802	8822	35	28	10	0.12	377	0.9	0.9	419	419	420	420	1000	1000	6.8	6.8
CLASSROOM 211	CLASSROOMS (AGE 9 PLUS)	783	8613	35	27	10	0.12	368	0.9	0.9	409	409	410	410	1500	1500	10.4	10.4
GENERAL SCIENCE 212	CLASSROOMS (AGE 9 PLUS)	929	10219	35	33	10	0.12	437	0.9	0.9	485	485	490	490	1250	1250	7.3	7.3
CLASSROOM 213	CLASSROOMS (AGE 9 PLUS)	798	8778	35	28	10	0.12	375	0.9	0.9	417	417	420	420	1500	1500	10.3	7.3
GYMNASIUM 160	GYM, STADIUM, ARENA (PLAY AREA)	7283	80113	7	51	20	0.18	2331	0.8	0.8	2913	2913	2915	2915	7050	7050	5.3	10.3

GYMNASIUM ROOF TOP HEAT PUMP UNITS

UNIT #	AREA SERVED	CAPACITY									AIRFLOW						COOLING					HEATING		ELECTRIC RESISTANCE HEATING		FILTER			WEIGHT (WITHOUT CURB)	ELECTRICAL			BASIS OF DESIGN
		NOMINAL CAPACITY (TONS)	REFRIG-ERANT	TOTAL COOLING CAPACITY (MBH)	HEATING CAPACITY	BACKUP ELECTRIC HEATING CAPACITY (KW)	MINIMUM ISMRE (DEHUM-DIFICATION MODE)	MINIMUM SEER	MINIMUM IEER	CONDENSER EAT (°F DB)	SPEED CONTROL	TOTAL SUPPLY AIRFLOW (CFM)	MIN. OUTSIDE AIR (CFM)	ESP (IN WC)	EXHAUST AIR (CFM)	ESP (IN WC)	EAT (°F DB)	EAT (°F WB)	LAT (°F DB)	LAT (°F WB)	MAX. FACE VELOCITY (FPM)	EAT (°F DB)	LAT (°F DB)	CAPACITY (BTU/H)	CAPACITY (KW)	SUPPLY PRE-FILTER MERV	SUPPLY FINAL FILTER MERV	RETURN FILTER MERV	LBS	MCA	MAX FUSE SIZE	VOLT/PH/HZ	
RTU-1	GYMNASIUM	12	R-410A	132.1	166.0	60	5.2	10.4	11.4	95	CONSTANT	3525	1460	1.5	1460	1.5	78.0	67.0	55.0	55.0	500	46.2	90.0	166000	60	8	13	8	3231	63.3	80	208/3/60	TRANE HORIZON (OAD/N REV6 - OADG/OANG)
RTU-2	GYMNASIUM	12	R-410A	132.1	166.0	60	5.2	10.4	11.4	95	CONSTANT	3525	1460	1.5	1460	1.5	78.0	67.0	56.0	56.0	500	46.2	90.0	166000	60	8	13	8	3231	63.3	80	208/3/60	TRANE HORIZON (OAD/N REV6 - OADG/OANG)

DEDICATED OUTSIDE AIR SYSTEM SCHEDULE NOTES:
1. PROVIDE A DISCONNECT SWITCH AND POWERED CONVENIENCE OUTLET WITH SINGLE POINT POWER CONNECTION.
2. PROVIDE A FULLY PROGRAMMABLE CONTROLLER WITH GRAPHICAL USER INTERFACE.
3. PROVIDE HOT GAS REHEAT.
4. PROVIDE VIBRATION ISOLATORS AND POSITIVELY FASTEN UNIT TO DUNNAGE PER DETAIL 9/M501.
5. PROVIDE ENERGY RECOVERY WHEEL.
6. PROVIDE HEAT PUMP HEATING WITH ELECTRIC RESISTANCE BACKUP HEAT. SIZE THE ELECTRIC HEAT ASSUMING AN ENERGY WHEEL EFFICIENCY OF 50%.

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901

Structural Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901

UNIVENT
REPLACEMENT AT
FARLEY
ELEMENTARY
SCHOOL
SED # 50-02-01-08-0-003-011
COUNTY OF ROCKLAND
###

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-768-9200
www.shilale.com

Drawing Title
MECHANICAL SCHEDULES - 1

Drawing No.
FES-M-002

UNIT VENTILATOR SCHEDULE NOTES:

1. PROVIDE WITH CONDENSATE PUMP.
2. ELECTRICAL CONTRACTOR TO PROVIDE ALL UNIT VENTILATORS WITH FACTORY MADE DISCONNECT SWITCH.

UNIT VENTILATOR SCHEDULE

UNIT TAG	ASSOCIATED OUTDOOR UNIT	LOCATION	CONFIGURATION	TOTAL SUPPLY AIRFLOW (CFM)	MINIMUM OUTSIDE AIRFLOW		MAXIMUM OUTSIDE AIRFLOW (CFM)	COOLING					HEATING						FILTER	ELECTRICAL			UNIT WEIGHT LBS	UNIT DIMENSIONS (LxH, IN) (V.I.F.)	UNIT DEPTH (IN)	BASIS OF DESIGN	NOTES
					COOLING	HEATING		EADB (°F)	EAWB (°F)	LADB (°F)	LAWB (°F)	MIN TOTAL CAPACITY (BTU/H)	REQUIRED TOTAL CAPACITY (BTU/H)	HEAT PUMP		HOT WATER										MODEL NUMBER	
														EADB (°F)	LADB (°F)	EWT (°F)	LWT (°F)	GPM	MERV	MCA	MAX FUSE SIZE	V/PH/HZ					
UV-141	HP-1	RM 141	VERTICAL	750	435	435	750	82.9	67.0	55	54	22,300	44,200	35.5	90	140	120	4.42	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-142	HP-1	RM 142	VERTICAL	1000	470	470	1000	82.0	67.0	55	54	29,700	51,400	42.4	90	140	120	5.14	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-144	HP-1	RM 144	VERTICAL	750	410	410	750	82.6	67.0	55	54	22,300	42,500	37.6	90	140	120	4.25	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-145A	HP-1	RM 145	VERTICAL	1000	185	185	1000	79.6	67.0	55	54	29,700	32,000	60.3	90	140	120	3.2	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-145B	HP-1	RM 145	VERTICAL	1000	185	185	1000	79.6	67.0	55	54	29,700	32,000	60.3	90	140	120	3.2	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-146	HP-1	RM 146	VERTICAL	750	415	415	750	82.7	67.0	55	54	22,300	42,800	37.1	90	140	120	4.28	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-148	HP-1	RM 148	VERTICAL	750	290	290	750	81.3	67.0	55	54	22,300	34,300	47.6	90	140	120	3.43	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-150	HP-1	RM 150	VERTICAL	750	420	420	750	82.8	67.0	55	54	22,300	43,200	36.7	90	140	120	4.32	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-151	HP-1	RM 151	VERTICAL	750	300	300	750	81.4	67.0	55	54	22,300	35,000	46.8	90	140	120	3.5	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-152	HP-1	RM 152	VERTICAL	750	50	50	750	78.6	67.0	55	54	22,300	18,000	67.8	90	140	120	1.8	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-153	HP-1	RM 153	VERTICAL	750	270	270	750	81.1	67.0	55	54	22,300	33,000	49.3	90	140	120	3.3	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-154A	HP-1	RM 154	VERTICAL	750	165	165	750	79.9	67.0	55	54	22,300	25,800	58.1	90	140	120	2.58	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-154B	HP-1	RM 154	VERTICAL	750	165	165	750	79.9	67.0	55	54	22,300	25,800	58.1	90	140	120	2.58	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-158	HP-1	RM 158	HORIZONTAL	1250	450	450	1250	81.1	67.0	55	54	37,100	54,900	49.3	90	140	120	5.49	13	12	16	115/1/60	435	94.25x38	21.25	TRANE HUVC125	1
UV-123	HP-2	RM 123	VERTICAL	750	80	80	750	78.9	67.0	55	54	22,300	20,000	65.3	90	140	120	2	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-124	HP-2	RM 124	VERTICAL	750	305	305	750	81.5	67.0	55	54	22,300	35,300	46.4	90	140	120	3.53	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-125	HP-2	RM 125	VERTICAL	750	425	425	750	82.8	67.0	55	54	22,300	43,500	36.3	90	140	120	4.35	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-127	HP-2	RM 127	VERTICAL	750	410	410	750	82.6	67.0	55	54	22,300	42,500	37.6	90	140	120	4.25	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-129	HP-2	RM 129	VERTICAL	750	425	425	750	82.8	67.0	55	54	22,300	43,500	36.3	90	140	120	4.35	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-130	HP-2	RM 130	VERTICAL	750	425	425	750	82.8	67.0	55	54	22,300	43,500	36.3	90	140	120	4.35	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-132	HP-2	RM 132	VERTICAL	750	425	425	750	82.8	67.0	55	54	22,300	43,500	36.3	90	140	120	4.35	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-133	HP-2	RM 133	VERTICAL	750	430	430	750	82.9	67.0	55	54	22,300	43,800	35.9	90	140	120	4.38	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-134	HP-2	RM 134	VERTICAL	750	425	425	750	82.8	67.0	55	54	22,300	43,500	36.3	90	140	120	4.35	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-135	HP-2	RM 135	VERTICAL	750	430	430	750	82.9	67.0	55	54	22,300	43,800	35.9	90	140	120	4.38	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-136	HP-2	RM 136	VERTICAL	750	425	425	750	82.8	67.0	55	54	22,300	43,500	36.3	90	140	120	4.35	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-137	HP-2	RM 137	VERTICAL	750	430	430	750	82.9	67.0	55	54	22,300	43,800	35.9	90	140	120	4.38	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-138A	HP-2	RM 138A	VERTICAL	750	255	255	750	80.9	67.0	55	54	22,300	31,900	50.6	90	140	120	3.19	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-138B	HP-2	RM 138B	HORIZONTAL	750	270	270	750	81.1	67.0	55	54	22,300	33,000	49.3	90	140	120	3.3	13	12	16	115/1/60	340	70.25x36	21.25	TRANE HUVC075	1
UV-139	HP-2	RM 139	VERTICAL	1000	470	470	1000	82.0	67.0	55	54	29,700	51,400	42.4	90	140	120	5.14	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-140	HP-2	RM 140	VERTICAL	750	445	445	750	83.0	67.0	55	54	22,300	44,900	34.6	90	140	120	4.49	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-159	HP-2	RM 159	HORIZONTAL	1250	400	400	1250	80.7	67.0	55	54	37,100	51,500	51.8	90	140	120	5.15	13	12	16	115/1/60	435	94.25x38	21.25	TRANE HUVC125	1
UV-101A	HP-3	RM 101	VERTICAL	750	255	255	750	80.9	67.0	55	54	22,300	31,900	50.6	90	140	120	3.19	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-101B	HP-3	RM 101	VERTICAL	750	255	255	750	80.9	67.0	55	54	22,300	31,900	50.6	90	140	120	3.19	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-103	HP-3	RM 103	VERTICAL	1000	435	435	1000	81.7	67.0	55	54	29,700	49,000	44.6	90	140	120	4.9	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-105	HP-3	RM 105	VERTICAL	750	115	115	750	79.3	67.0	55	54	22,300	22,400	62.3	90	140	120	2.24	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-106	HP-3	RM 106	VERTICAL	750	40	40	750	78.5	67.0	55	54	22,300	17,300	68.6	90	140	120	1.73	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	1
UV-107	HP-3	RM 107	HORIZONTAL	2000	760	760	2000	81.2	67.0	55	54	59,400	90,600	48.1	90	140	120	9.06	13	12	16	115/1/60	600	106.25x43	21.25	TRANE HUVC200	1
UV-108	HP-3	RM 108	HORIZONTAL	2000	755	755	2000	81.2	67.0	55	54	59,400	90,300	48.2	90	140	120	9.03	13	12	16	115/1/60	600	106.25x43	21.25	TRANE HUVC200	1
UV-111	HP-3	RM 111	HORIZONTAL	750	250	250	750	80.8	67.0	55	54	22,300	31,600	51.0	90	140	120	3.16	13	12	16	115/1/60	340	70.25x36	21.25	TRANE HUVC075	1
UV-112	HP-3	RM 112	VERTICAL	750	440	440	750	83.0	67.0	55	54	22,300	44,500	35.0	90	140	120	4.45	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-113	HP-3	RM 113	VERTICAL	750	440	440	750	83.0	67.0	55	54	22,300	44,500	35.0	90	140	120	4.45	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-114	HP-3	RM 114	VERTICAL	750	440	440	750	83.0	67.0	55	54	22,300	44,500	35.0	90	140	120	4.45	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-115	HP-3	RM 115	VERTICAL	750	450	450	750	83.1	67.0	55	54	22,300	45,200	34.2	90	140	120	4.52	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-116	HP-3	RM 116	VERTICAL	750	440	440	750	83.0	67.0	55	54	22,300	44,500	35.0	90	140	120	4.45	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-117	HP-3	RM 117	VERTICAL	750	445	445	750	83.0	67.0	55	54	22,300	44,900	34.6	90	140	120	4.49	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-118	HP-3	RM 118	VERTICAL	750	445	445	750	83.0	67.0	55	54	22,300	44,900	34.6	90	140	120	4.49	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-121	HP-3	RM 121	VERTICAL	750	50	50	750	78.6	67.0	55	54	22,300	18,000	67.8	90	140	120	1.8	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-122	HP-3	RM 122	VERTICAL	750	60	60	750	78.7	67.0	55	54	22,300	18,700	67.0	90	140	120	1.87	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
IU-120	HP-3	RM 120	CEILING CASSETTE	150	20	20	150	79.1	67.0	55	54	4,500	4,300	63.6	90	N/A	N/A	N/A	13	1		208/1/160	46	33.06 X 33.06	37.4	TRANE PLA-A12EA7	
IU-128	HP-3	RM 128	CEILING CASSETTE	250	35	35	250	79.2	67.0	55	54	7,400	7,200	63.2	90	N/A	N/A	N/A	13	1		208/1/161	46	33.06 X 33.06	37.4	TRANE PLA-A12EA7	
IU-128A	HP-3	RM 122A	CEILING CASSETTE	250	35	35	250	79.2	67.0	55	54	7,400	7,200	63.2	90	N/A	N/A	N/A	13	1		208/1/162	46	33.06 X 33.06	37.4	TRANE PLA-A12EA7	
IU-128D	HP-3	RM 128D	CEILING CASSETTE	110	35	35	110	80.7	67.0	55	54	3,300	4,500	52.0	90	N/A	N/A	N/A	13	1		208/1/163	46	33.06 X 33.06	37.4	TRANE PLA-A12EA7	
IU-158A	HP-1	RM 158A	CEILING CASSETTE	110	35	35	110	80.7	67.0	55	54	3,300	4,500	52.0	90	N/A	N/A	N/A	13	1		208/1/164	46	33.06 X 33.06	37.4	TRANE PLA-A12EA7	
IU-159A	HP-2	RM 159A	CEILING CASSETTE	110	35	35	110	80.7	67.0	55	54	3,300	4,500	52.0	90	N/A	N/A	N/A	13	1		208/1/165	46	33.06 X 33.06	37.4	TRANE PLA-A12EA7	
UV-202	HP-4	RM 202	VERTICAL	750	435	435	750	82.9	67.0	55	54	22,300	44,200	35.5	90	140	120	4.42	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-203	HP-4	RM 203	VERTICAL	750	415	415	750	82.7	67.0	55	54	22,300	42,800	37.1	90	140	120	4.28	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-204	HP-4	RM 204	VERTICAL	750	330	330	750	81.7	67.0	55	54	22,300	37,000	44.3	90	140	120	3.7	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-205	HP-4	RM 205	VERTICAL	750	50	50	750	78.6	67.0	55	54	22,300	18,000	67.8	90	140	120	1.8	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-206	HP-4	RM 206	VERTICAL	750	330	330	750	81.7	67.0	55	54	22,300	37,000	44.3	90	140	120	3.7	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-207	HP-4	RM 207	VERTICAL	750	410	410	750	82.6	67.0	55	54	22,300	42,500	37.6	90	140	120	4.25	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-208	HP-4	RM 208	VERTICAL	1000	490	490	1000	82.2	67.0	55	54	29,700	52,800	41.1	90	140	120	5.28	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-209	HP-4	RM 209	VERTICAL	750	415	415	750	82.7	67.0	55	54	22,300	42,800	37.1	90	140	120	4.28	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-210	HP-4	RM 210	VERTICAL	750	420	420	750	82.8	67.0	55	54	22,300	43,200	36.7	90	140	120	4.32	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-211	HP-4	RM 211	VERTICAL	750	410	410	750	82.6	67.0	55	54	22,300	42,500	37.6	90	140	120	4.25	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-212	HP-4	RM 212	VERTICAL	1000	490	490	1000	82.2	67.0	55	54	29,700	52,800	41.1	90	140	120	5.28	13	4.38	16	115/1/60	405	81x30	21.25	TRANE VUVE100	
UV-213	HP-4	RM 213	VERTICAL	750	420	420	750	82.8	67.0	55	54	22,300	43,200	36.7	90	140	120	4.32	13	4.38	16	115/1/60	320	69x30	21.25	TRANE VUVE075	

DUCTLESS HEAT PUMP OUTDOOR UNIT SCHEDULE

UNIT #	LOCATION	TOTAL COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	EER	IEER	REFRIG-ERANT	REFRIG-ERANT SAFETY CLASS	REFRIG CHARGE (LBS)	HEATING TYPE	CONDENSER	COMPRESSOR	ELECTRICAL					UNIT WEIGHT (LBS)	BASIS OF DESIGN		REMARKS
										EA DB °F (COOLING/ HEATING)	TYPE	VOLTS	PHASE	Hz	MOCP (A)	MCA (A)		MANUFACTURER	MODEL #	
HP-1	ROOF	264.0	295.0	9.3	12.5	R410A	A1	34.375	HEAT PUMP	95/0	SCROLL	208	3	60	80 / 60	49.0 / 41.0	1,302	TRANE	TURYE2643BN40A(N/B)	SEE NOTES
HP-2	ROOF	384.0	430.0	9.3	12.5	R410A	A1	52.125	HEAT PUMP	95/0	SCROLL	208	3	60	110 / 110	66.0 / 66.0	1,774	TRANE	TURYE3843BN40A(N/B)	SEE NOTES
HP-3	ROOF	384.0	430.0	9.3	12.5	R410A	A1	52.125	HEAT PUMP	95/0	SCROLL	208	3	60	110 / 110	66.0 / 66.0	1,774	TRANE	TURYE3843BN40A(N/B)	SEE NOTES
HP-4	ROOF	432.0	480.0	9.3	12.5	R410A	A1	52.125	HEAT PUMP	95/0	SCROLL	208	3	60	125 / 125	73.0 / 73.0	1,774	TRANE	TURYE4323BN40A(N/B)	SEE NOTES

DUCTLESS SPLIT-SYSTEM OUTDOOR UNIT SCHEDULE NOTES:
1. REFER TO THE DUCTLESS HEAT PUMP INDOOR UNIT SCHEDULE FOR CORRESPONDING INDOOR UNITS. ALL UNITS SHALL BE A PRODUCT OF ONE MANUFACTURER.
2. FURNISH DISCONNECT SWITCH TO BE INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
3. PROVIDE STAND ALONE FACTORY INSTALLED DIRECT DIGITAL CONTROLS AS NECESSARY TO SATISFY THE SEQUENCE OF OPERATIONS.
4. PROVIDE VIBRATION ISOLATION.
5. PROVIDE MANUFACTURER'S STANDARD OUTDOOR UNIT DRAIN PAN WITH BASE PAN HEATER AND PIPE TO NEARBY DRAIN.
6. PROVIDE WIND BAFFLE AND OTHER ACCESSORIES AS REQUIRED BY THE MANUFACTURER FOR LOW AMBIENT COOLING AND HEATING TO 0°F OUTDOOR DRY-BULB TEMPERATURE.

VRF HEAT RECOVERY BRANCH CIRCUIT CONTROLLER SCHEDULE

TAG REFERENCE	MODEL NUMBER	TYPE (DOUBLE / MAIN / SUB)	NUMBER OF PORTS	CONNECTED CAPACITY TO BC	VOLTAGE / PHASE	POWER COOLING 208V/230V (KW)	POWER HEATING 208V/230V (KW)	MCA 208/230	NOTES / OPTIONS
BC-1	TCMB1016KA11N4	MAIN	16	352,500	208/230V/1-PHASE	1.25/1.45	0.66/0.77	1.6/1.8	1, 2, 3, 4
BC-2A	TCMB1016KA11N4	MAIN	16	364,200	208/230V/1-PHASE	1.25/1.45	0.66/0.77	1.6/1.8	1, 2, 3, 4
BC-2B	TCMBS0104KB11N4	SUB	4	3,300	208/230V/1-PHASE	0.30/0.35	0.15/0.18	0.4/0.4	1, 2, 3, 4
BC-3A	TCMB1016KA11N4	MAIN	16	200,700	208/230V/1-PHASE	1.25/1.45	0.66/0.77	1.6/1.8	1, 2, 3, 4
BC-3B	TCMB1016KA11N4	MAIN	16	282,600	208/230V/1-PHASE	1.25/1.45	0.66/0.77	1.6/1.8	1, 2, 3, 4
BC-4	TCMB1016KA11N4	MAIN	16	282,400	208/230V/1-PHASE	1.25/1.45	0.66/0.77	1.6/1.8	1, 2, 3, 4

BC CONTROLLER SCHEDULE NOTES:
1. INCLUDE DIAMONDBACK BALL VALVES BV-SERIES, 700PSIG WORKING PRESSURE, FULL PORT, 410A RATED.
2. A SUB BC CONTROLLER IS NOT REQUIRED FOR THIS PROJECT. FOR SUB BC CONTROLLER INFO, SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. PROVIDE REFRIGERATION BALL VALVE-BRAZE/SCHRADER/INSULATED - 3/8" SIZE
4. PROVIDE REFRIGERATION BALL VALVE-BRAZE/SCHRADER/INSULATED - 5/8" SIZE

No.	Revisions	Date
REV 3	BIDDING DOCUMENTS	09-14-23
REV 2	SED ADDENDUM #1	06-09-23
REV 1	BIDDING DOCUMENTS	12-28-22

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

GREENMAN PEDERSEN, INC
2 BLEECKER BOULEVARD
SUITE 302
SUFFERN, NY 10901
Mechanical & Electrical Engineer:

GREENMAN PEDERSEN, INC
2 BLEECKER BOULEVARD
SUITE 302
SUFFERN, NY 10901
Structural Engineer:

UNIVENT REPLACEMENT AT FARLEY ELEMENTARY
SED # 50-02-01-06-0-003-011
COUNTY OF ROCKLAND
###

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Drawing Title
MECHANICAL SCHEDULES - 2

Drawing No.
FES-M-003

KEYED NOTES:

1. DEMOLISH EXISTING UNIT VENTILATOR OR FCU. TEMPORARILY CAP HWS & HWR SERVING UNIT VENTILATOR & PROVIDE TEMPORARY CLOSURE FOR OA LOUVER TO PREVENT INFILTRATION FROM OUTDOORS.
2. EXISTING 72"x10" (V.I.F.) WALL LOUVER TO REMAIN.
3. EXISTING EXHAUST REGISTERS TO REMAIN. INCLUDE THE EXISTING EXHAUST GRILLES IN THE AIR BALANCING REPORT. SIZES ARE AS INDICATED ON PLANS.
4. EXISTING FINNED TUBE CONVECTOR TO REMAIN. TRIM OR EXTEND ENCLOSURE TO FIT THE NEW UNIT VENTILATOR.

CORRIDOR 160A
119B
OFFICE 235 S.F. 152
WOMEN'S FACULTY 156B
HOME EC 797S.F. 150
CLASSROOM 552 S.F. 148
STORAGE 149
HOME EC 786 S.F. 146
BOOKSTORE 171
SCIENCE 785 S.F. 144
SCIENCE 894 S.F. 142
WORK RM 515S.F 153
CLASSROOM 623S.F. 154
CLASSROOM 566S.F. 151
GIRLS BATHROOM 147B
BOYS BATHROOM 147A
CUSTODIAL 147C
LIBRARY 1948S.F 145
LIB. STORE 145A
LIB OFFICE 145B
DARE OFFICE 143
CLASSROOM 830 S.F 141
CORRIDOR 150A
CLASSROOM 812S.F. 129
CLASSROOM 783S.F 127
CLASSROOM 807S.F 125
LOUNGE 806S.F. 123
STORAGE 131
CLASSROOM 811S.F. 130
CLASSROOM 812S.F. 132
CLASSROOM 812S.F. 134
CLASSROOM 812S.F. 136
COPY 126
NURSE 584 S.F. 122
CLASSROOM 579S.F. 124
EQUIP. PBX 131A
CLASSROOM 815S.F. 133
CLASSROOM 815S.F. 135
CLASSROOM 815S.F. 137
CORRIDOR 130A
ART 846S.F 140
ART 892S.F 139
ART 482S.F 138B
STORAGE 512S.F 138A
STORAGE 140A
STORAGE 139A
UV-123 UV-125 UV-127 UV-129 UV-130 UV-132 UV-134 UV-136 UV-137 UV-135 UV-133 UV-124 UV-122 UV-138A UV-139 UV-140 UV-141 UV-142 UV-144 UV-146 UV-148 UV-150 UV-152 UV-153 UV-154A UV-154B UV-151 UV-145A UV-145B
14X12 14X20 24X24 24X10 26X14 14X14

PORTION OF EXISTING RADIATOR TO BE DEMOLISHED, & DISPOSED OF FOR UNIT VENTILATOR INSTALLATION.

AREA OF WORK

1 FIRST FLOOR PLAN DEMOLITION - 1
SCALE: 3/32" = 1' - 0"

2 FIRST FLOOR KEY PLAN
SCALE: NONE

PLAN NORTH

No.	Revisions	Date
REV 3	BIDDING DOCUMENTS	09-14-23
REV 2	SED ADDENDUM #1	06-09-23
REV 1	BIDDING DOCUMENTS	12-28-22

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

Mechanical & Electrical Engineer: GREENMAN PEDERSEN, INC 2 RESEARCH BOULEVARD SUITE 302 SUFFERN, NY 10901

Structural Engineer: GREENMAN PEDERSEN, INC 2 RESEARCH BOULEVARD SUITE 302 SUFFERN, NY 10901

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SCHOOL
COUNTY OF ROCKLAND
###

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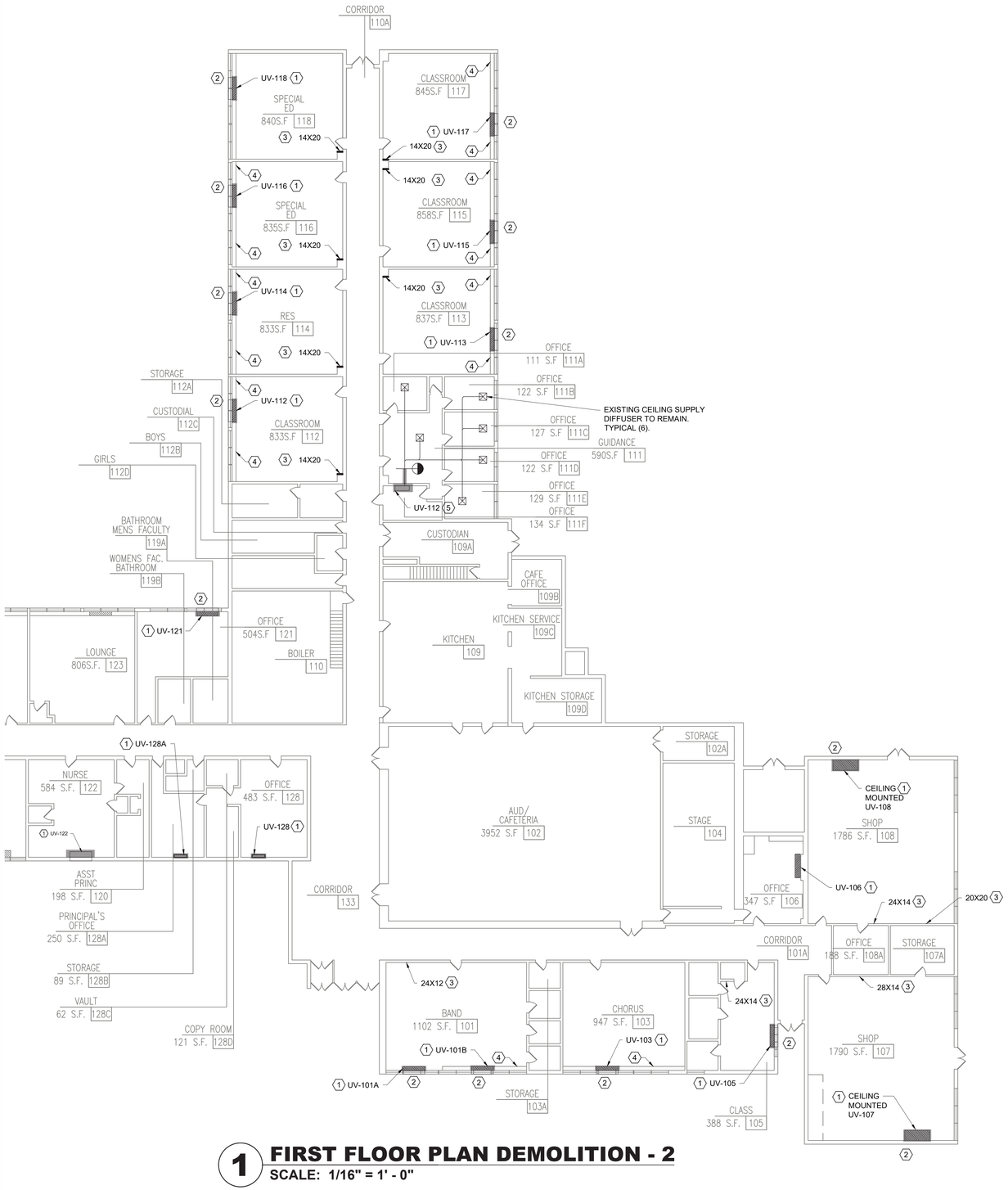
Drawing Title
HVAC DEMO FIRST FLOOR PLAN - 1

Drawing No.
FES-M-061

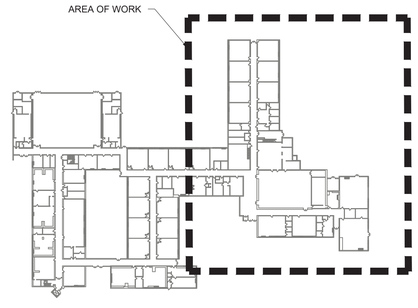


1 FIRST FLOOR PLAN DEMOLITION - 2

SCALE: 1/16" = 1' - 0"

KEYED NOTES:

1. DEMOLISH EXISTING UNIT VENTILATOR OR FCU. TEMPORARILY CAP HW PIPING & PROVIDE TEMPORARY CLOSURE FOR OA LOUVER TO PREVENT INFILTRATION FROM OUTDOORS.
2. EXISTING 72"x10" (V.I.F.) WALL LOUVER TO REMAIN.
3. EXISTING EXHAUST GRILLES TO REMAIN. INCLUDE THE EXISTING EXHAUST GRILLES IN THE AIR BALANCING REPORT. SIZES ARE AS INDICATED ON PLANS.
4. EXISTING FINNED TUBE CONVECTOR TO REMAIN. TRIM OR EXTEND ENCLOSURE TO FIT THE NEW UNIT VENTILATOR.
5. EXISTING HORIZONTAL UNIT VENTILATOR TO BE REMOVED ALONG WITH PORTION OF DUCTWORK.



2 FIRST FLOOR KEY PLAN

SCALE: NONE

PLAN NORTH

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

GREENMAN PEDERSEN, INC
2 RESEARCH BOULEVARD
SUITE 302
SUFFERN, NY 10901

Mechanical & Electrical Engineer:

Structural Engineer:

UNIVENT REPLACEMENT AT FARLEY ELEMENTARY
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SED # 50-02-01-08-0-003-011
COUNTY OF ROCKLAND

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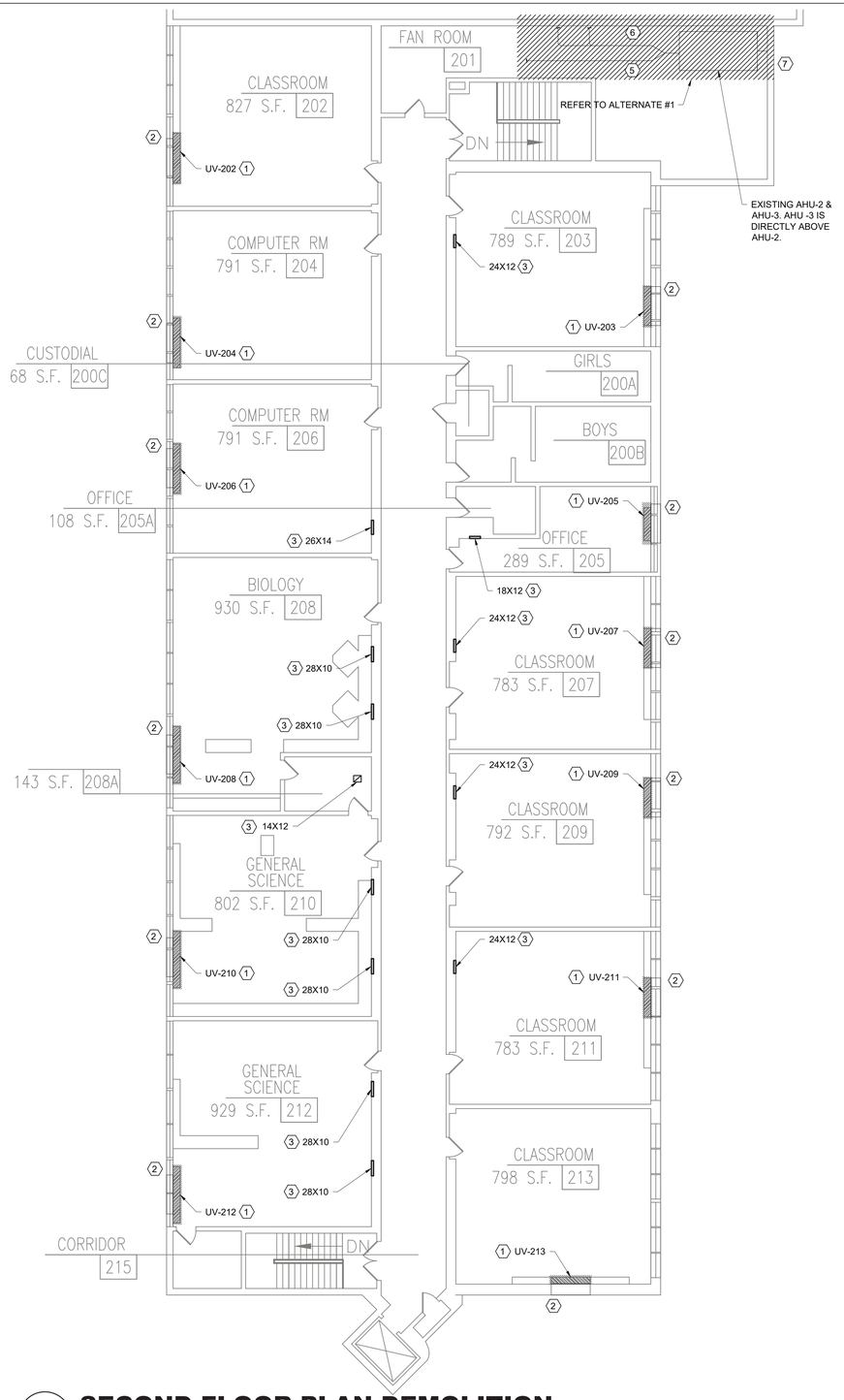
Drawing Title
HVAC DEMO FIRST FLOOR PLAN - 2

Drawing No.
FES-M-062



KEYED NOTES:

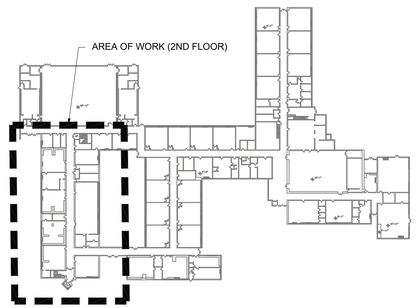
1. DEMOLISH EXISTING UNIT VENTILATOR OR FCU. TEMPORARILY CAP HW PIPING & PROVIDE TEMPORARY CLOSURE FOR OA LOUVER TO PREVENT INFILTRATION FROM OUTDOORS.
2. EXISTING 72"x10" (V.I.F.) WALL LOUVER TO REMAIN.
3. EXISTING EXHAUST GRILLES TO REMAIN. INCLUDE THE EXISTING EXHAUST GRILLES IN THE AIR BALANCING REPORT. SIZES ARE AS INDICATED ON PLANS.
4. EXISTING FINNED TUBE CONVECTOR TO REMAIN. TRIM OR EXTEND ENCLOSURE TO FIT THE NEW UNIT VENTILATOR.
5. EXISTING (2) 40X16 DUCTWORK FOR AHU-2 TO BE REMOVED.
6. EXISTING 32X40 (V.I.F) DUCTWORK FOR AHU-3 TO BE REMOVED.
7. PERMANENTLY CAP OUTSIDE AIR LOUVER WITH 22 GAUGE MIN. GALV. SHEET METAL & R-8 INSULATION BOARD.

NOTES:

ALTERNATE #1: REMOVE EXISTING AHU-2, AHU-3, ASSOCIATED PIPING, DUCTWORK, & OA LOUVER.

1 SECOND FLOOR PLAN DEMOLITION

SCALE: 3/32" = 1' - 0"



2 SECOND FLOOR KEY PLAN

SCALE: NONE

PLAN NORTH

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

Mechanical & Electrical Engineer:
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Structural Engineer:
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COUNTY OF ROCKLAND

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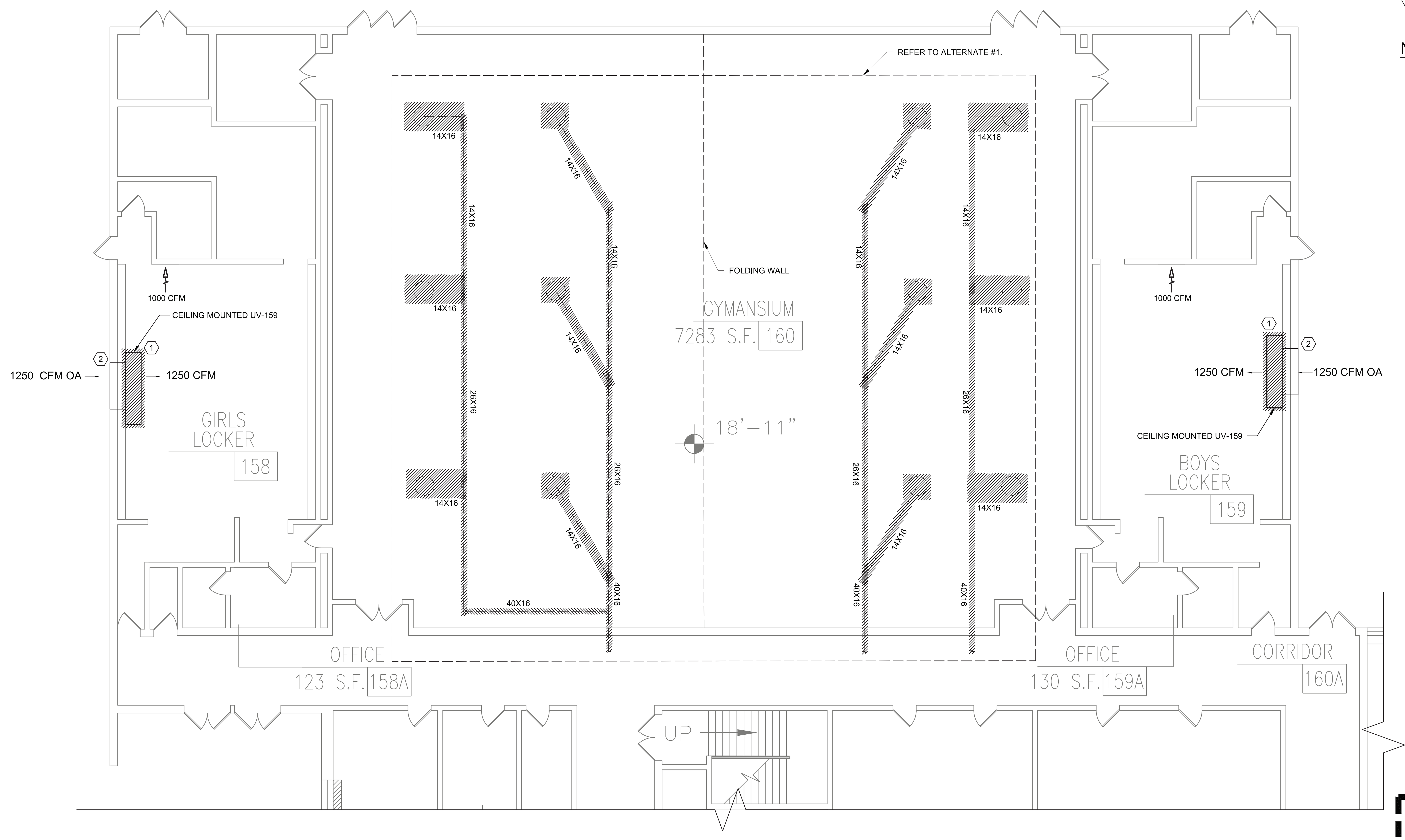
Drawing Title
HVAC DEMO SECOND FLOOR PLAN

Drawing No.
FES-M-063



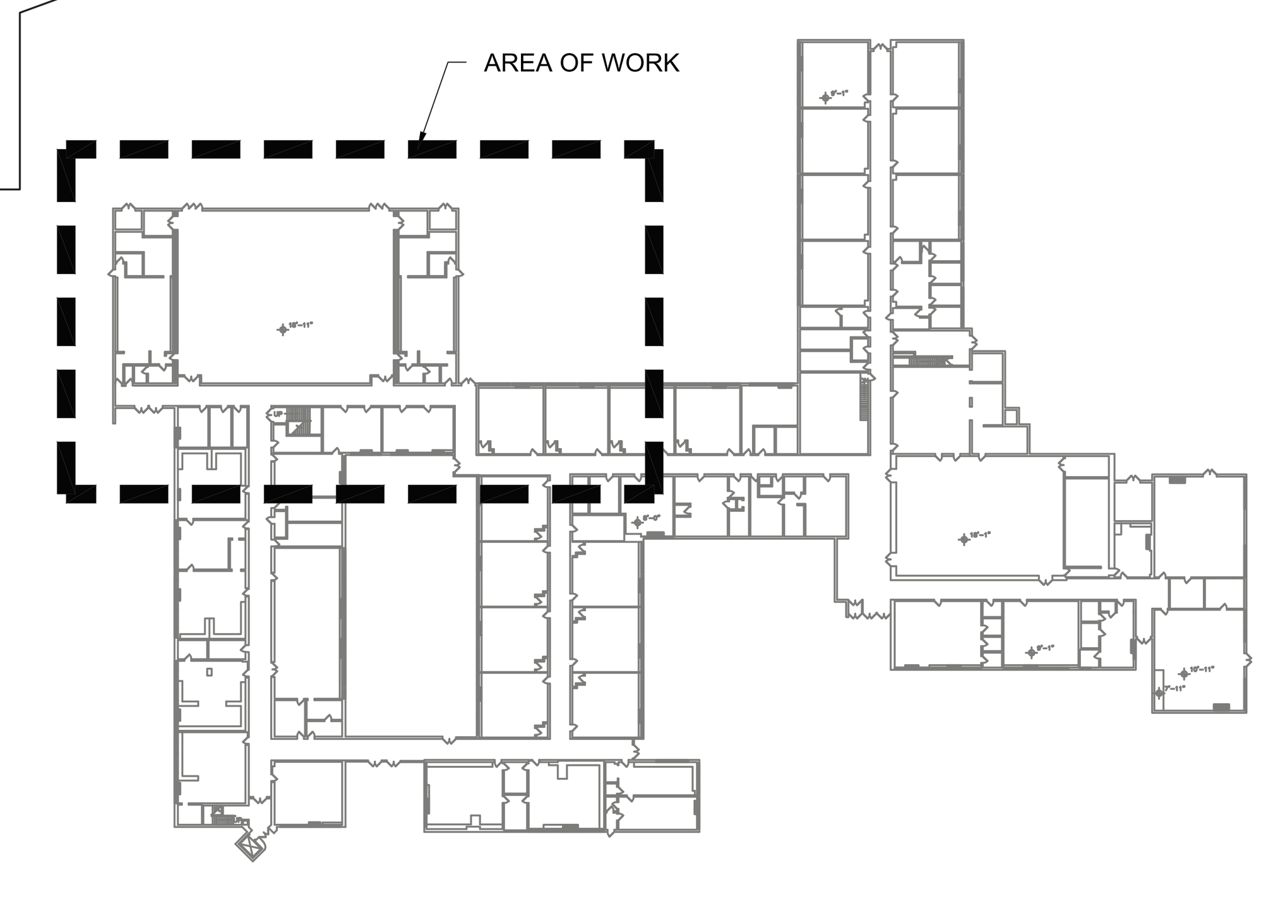
1 GYMNASIUM PARTIAL PLAN DEMOLITION
SCALE: 1/8" = 1' - 0"

KEYED NOTES:

1. DEMOLISH EXISTING HORIZONTAL UNIT VENTILATOR AT THE CEILING. TEMPORARY CAP HW PIPING & PROVIDE TEMPORARY ENCLOSURE FOR OA LOUVER TO PREVENT INFILTRATION FROM OUTDOORS.
2. EXISTING 57X10 (V.I.F) WALL LOUVER TO REMAIN.

NOTES:

ALTERNATE #1: REMOVE ALL EXISTING DUCTWORK, DIFFUSERS, APPURTENANCES, ETC.



2 GYMNASIUM KEY PLAN
SCALE: NONE

PLAN NORTH

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by	AMW
Checked by	PV
Project No.	42052
Scale	AS NOTED
Date	7/29/22

Mechanical & Electrical Engineer: GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 202 SUFFERN, NY 10901

Structural Engineer: GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 202 SUFFERN, NY 10901

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SED # 50-02-01-06-0-003-011

COUNTY OF ROCKLAND

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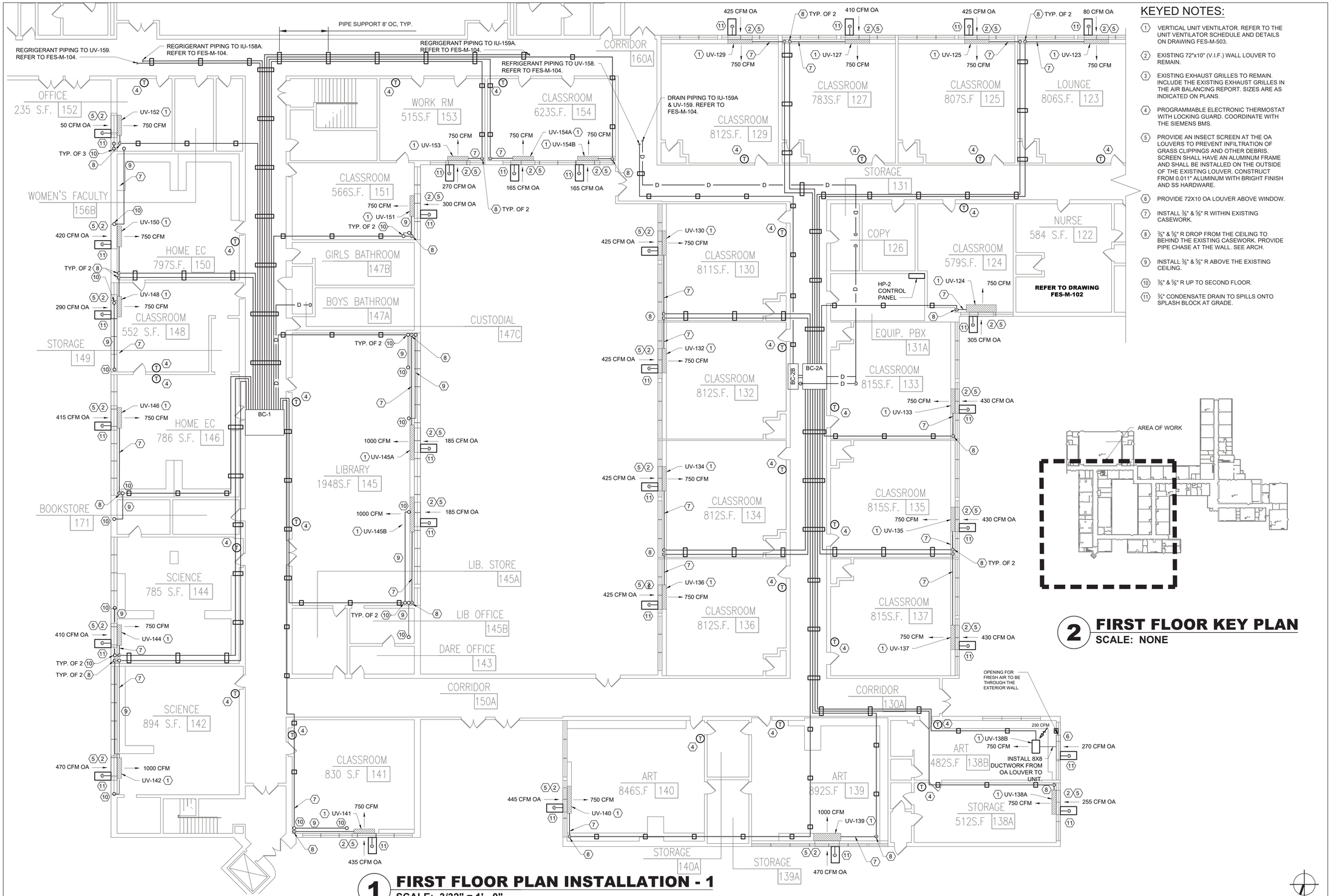
Drawing Title: HVAC DEMO GYMNASIUM PLAN

Drawing No. FES-M-064



KEYED NOTES:

1. VERTICAL UNIT VENTILATOR. REFER TO THE UNIT VENTILATOR SCHEDULE AND DETAILS ON DRAWING FES-M-503.
2. EXISTING 72"x10" (V.I.F.) WALL LOUVER TO REMAIN.
3. EXISTING EXHAUST GRILLES TO REMAIN. INCLUDE THE EXISTING EXHAUST GRILLES IN THE AIR BALANCING REPORT. SIZES ARE AS INDICATED ON PLANS.
4. PROGRAMMABLE ELECTRONIC THERMOSTAT WITH LOCKING GUARD. COORDINATE WITH THE SIEMENS BMS.
5. PROVIDE AN INSECT SCREEN AT THE OA LOUVERS TO PREVENT INFILTRATION OF GRASS CLIPPINGS AND OTHER DEBRIS. SCREEN SHALL HAVE AN ALUMINUM FRAME AND SHALL BE INSTALLED ON THE OUTSIDE OF THE EXISTING LOUVER. CONSTRUCT FROM 0.011" ALUMINUM WITH BRIGHT FINISH AND SS HARDWARE.
6. PROVIDE 72X10 OA LOUVER ABOVE WINDOW.
7. INSTALL ⅜" & ⅝" R WITHIN EXISTING CASEWORK.
8. ¾" & ⅝" R DROP FROM THE CEILING TO BEHIND THE EXISTING CASEWORK. PROVIDE PIPE CHASE AT THE WALL. SEE ARCH.
9. INSTALL ⅜" & ⅝" R ABOVE THE EXISTING CEILING.
10. ¾" & ⅝" R UP TO SECOND FLOOR.
11. ¾" CONDENSATE DRAIN TO SPILLS ONTO SPLASH BLOCK AT GRADE.

1 FIRST FLOOR PLAN INSTALLATION - 1

SCALE: 3/32" = 1' - 0"

2 FIRST FLOOR KEY PLAN

SCALE: NONE

No.	Revisions	Date
REV 3	BIDDING DOCUMENTS	09-14-23

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

GREENMAN PEDERSEN, INC
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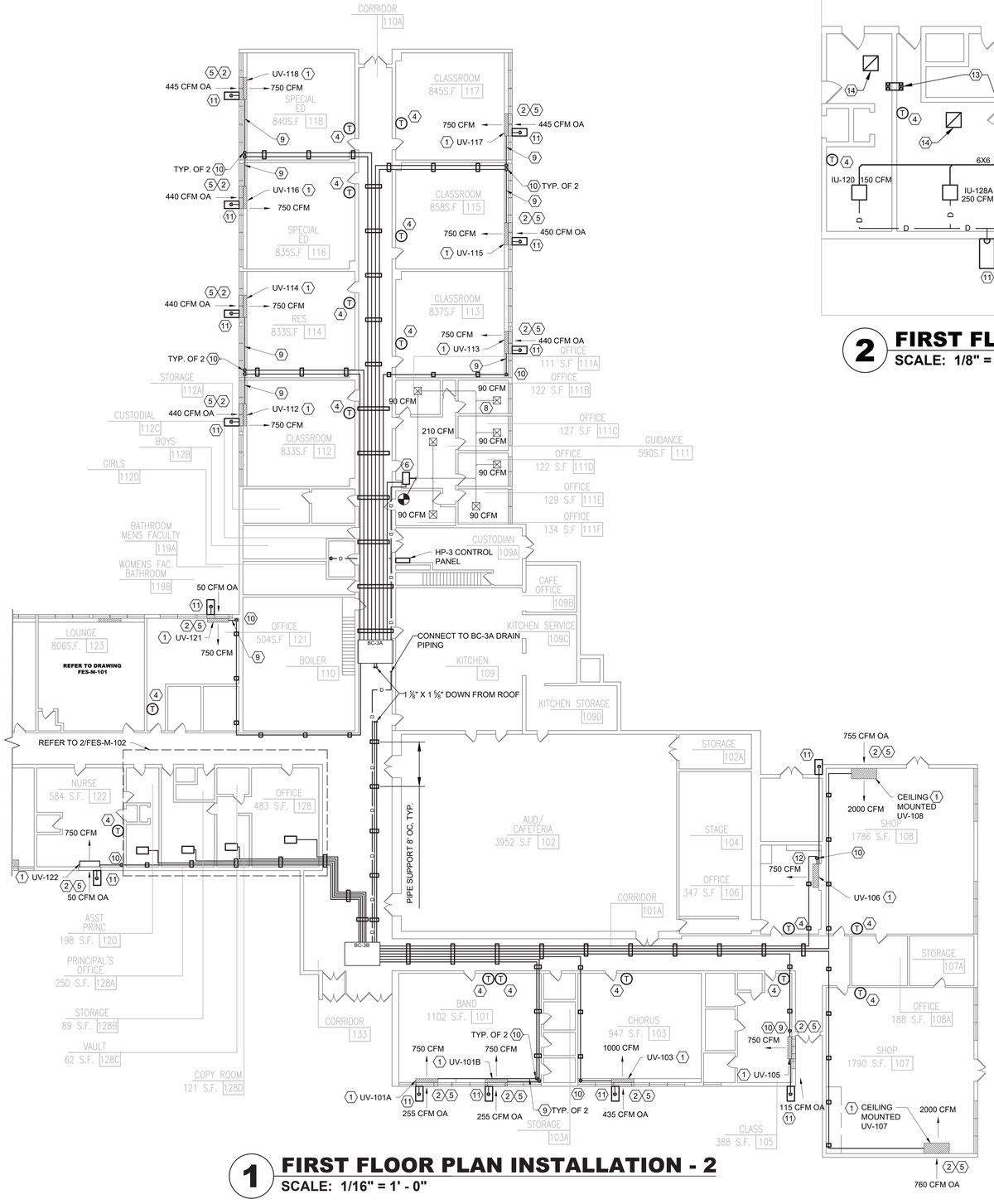
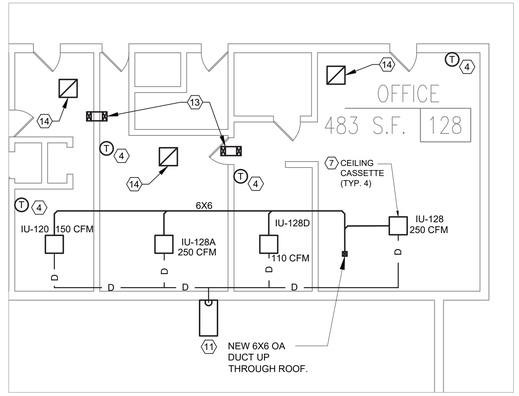
Drawing Title
HVAC INSTALLATION FIRST FLOOR PLAN - 1

Drawing No.
FES-M-101



1 FIRST FLOOR PLAN INSTALLATION - 2

SCALE: 1/16" = 1' - 0"

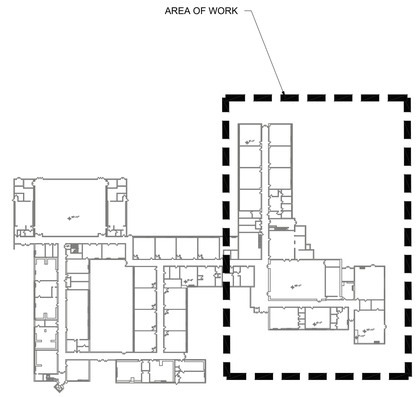


2 FIRST FLOOR PARTIAL PLAN

SCALE: 1/8" = 1' - 0"

KEYED NOTES:

1. VERTICAL UNIT VENTILATOR. REFER TO THE UNIT VENTILATOR SCHEDULE AND DETAILS ON DRAWING FES-M-503.
2. EXISTING 72"x10" (V.I.F.) WALL LOUVER TO REMAIN.
3. EXISTING EXHAUST GRILLES TO REMAIN. INCLUDE THE EXISTING EXHAUST GRILLES IN THE AIR BALANCING REPORT. SIZES ARE AS INDICATED ON PLANS.
4. PROGRAMMABLE ELECTRONIC THERMOSTAT WITH LOCKING GUARD. COORDINATE WITH THE SIEMENS BMS.
5. PROVIDE AN INSECT SCREEN AT THE OA LOUVERS TO PREVENT INFILTRATION OF GRASS CLIPPINGS AND OTHER DEBRIS. SCREEN SHALL HAVE AN ALUMINUM FRAME AND SHALL BE INSTALLED ON THE OUTSIDE OF THE EXISTING LOUVER. CONSTRUCT FROM 0.011" ALUMINUM WITH BRIGHT FINISH AND SS HARDWARE.
6. UV-111 TO TIE INTO THE EXISTING SUPPLY & OUTSIDE AIR DUCTWORK.
7. CEILING CASSETTE AT CEILING.
8. EXISTING CEILING SUPPLY DIFFUSER TO REMAIN. TYPICAL (7).
9. INSTALL ⅜" & ⅝" R WITHIN EXISTING CASEWORK.
10. ⅜" & ⅝" R DROP FROM THE CEILING TO BEHIND THE EXISTING CASEWORK. PROVIDE PIPE CHASE AT THE WALL. SEE ARCH.
11. ¾" CONDENSATE DRAIN TO SPILLS ONTO SPLASH BLOCK AT GRADE.
12. PROVIDE UNIT VENTILATOR WITH CONDENSATE LIFT PUMP.
13. 12"x6" TRANSFER DUCT ABOVE CEILING (PRICE CROSS TALK SILENCER XT OR EQUAL)
14. 24'x24' RG AT CEILING.



3 FIRST FLOOR KEY PLAN

SCALE: NONE

PLAN NORTH

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

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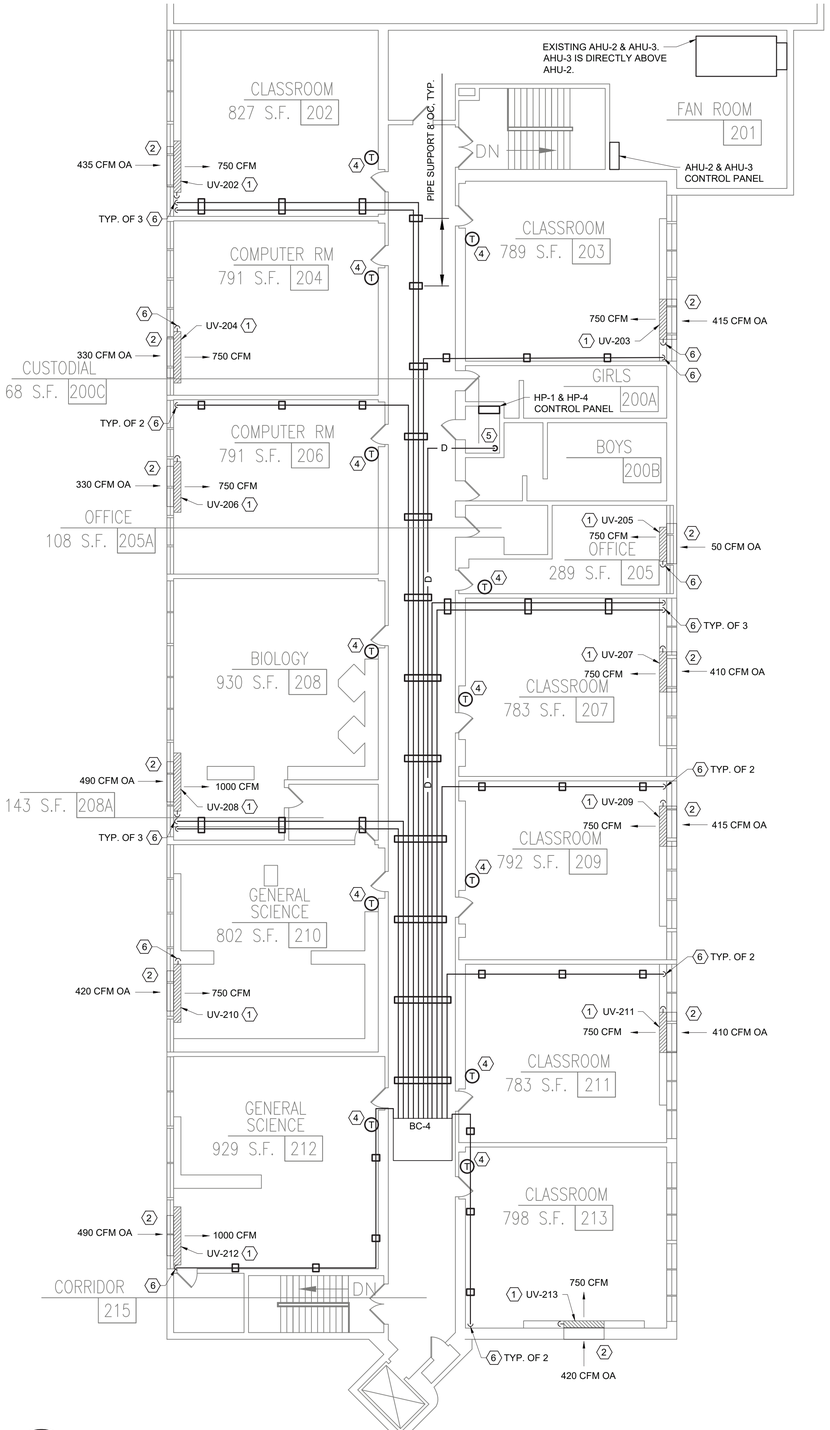
Drawing Title
HVAC INSTALLATION
FIRST FLOOR PLAN - 2

Drawing No.
FES-M-102

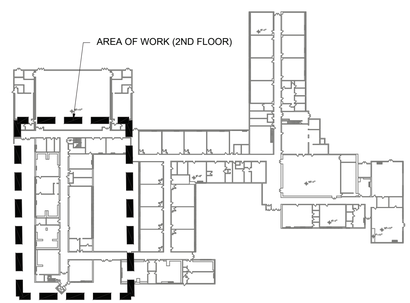


1 SECOND FLOOR PLAN INSTALLATION

SCALE: 3/32" = 1' - 0"

KEYED NOTES:

1. VERTICAL UNIT VENTILATOR OR FCU. REFER TO THE UNIT VENTILATOR SCHEDULE ON FES-M-503 SCHEDULE AND DETAILS ON DRAWING FES-M-501/2.
2. EXISTING 72"x10" (V.I.F.) WALL LOUVER TO REMAIN.
3. EXISTING EXHAUST GRILLES TO REMAIN. INCLUDE THE EXISTING EXHAUST GRILLES IN THE AIR BALANCING REPORT. SIZES ARE AS INDICATED ON PLANS.
4. PROGRAMMABLE ELECTRONIC THERMOSTAT WITH LOCKING GUARD. COORDINATE WITH THE SIEMENS BMS.
5. TERMINATE ¾" CONDENSATE DRAIN AT EXISTING SERVICE SINK.
6. ⅜" & ⅝" R DROP FROM THE CEILING TO BEHIND THE EXISTING CASEWORK. PROVIDE PIPE CHASE AT THE WALL. SEE ARCH.



2 SECOND FLOOR KEY PLAN

SCALE: NONE

PLAN NORTH

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
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Scale AS NOTED
Date 7/29/22

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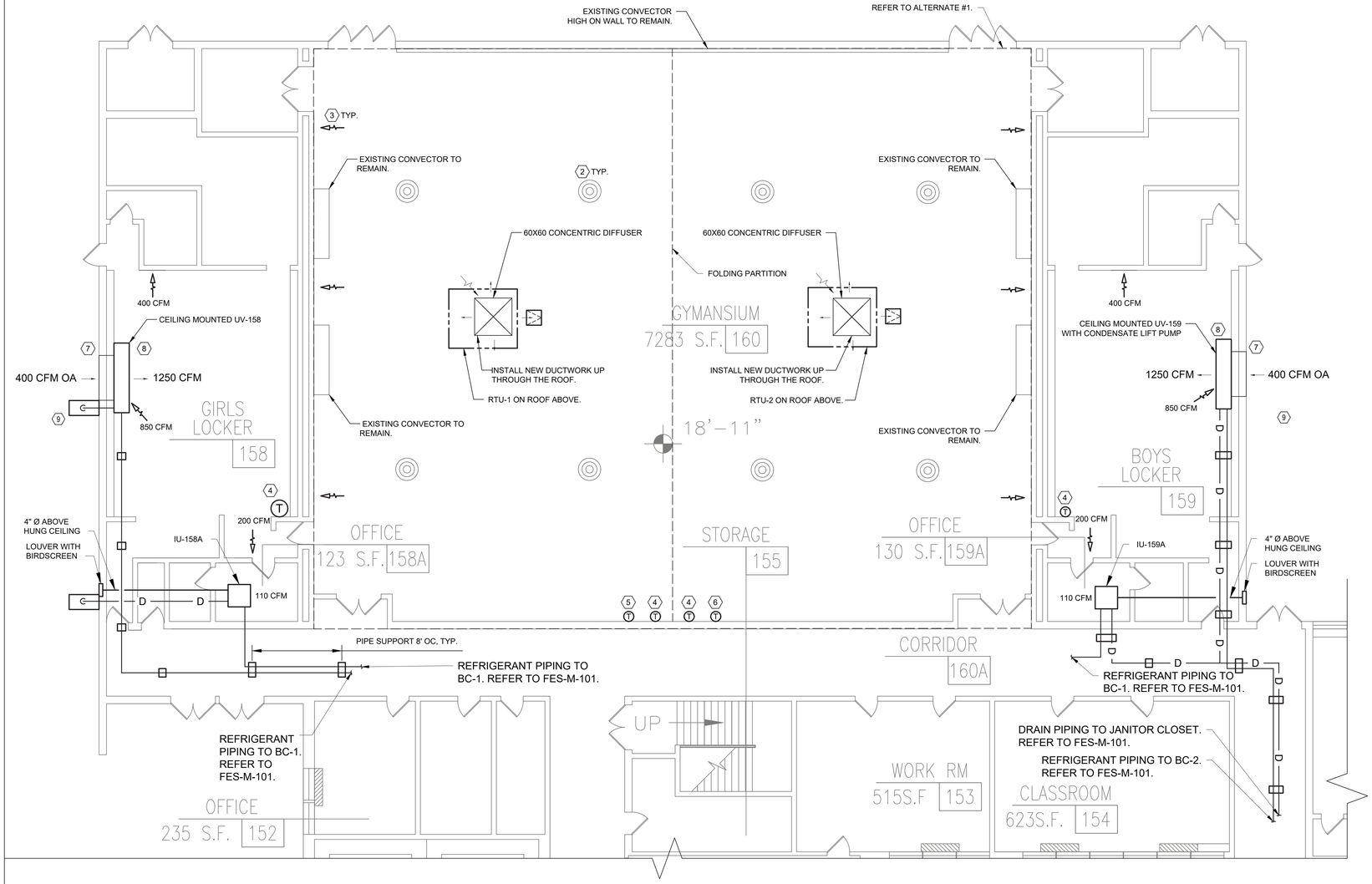
Drawing Title
HVAC INSTALLATION
SECOND FLOOR PLAN

Drawing No.
FES-M-103

KEYED NOTES:

1. 60X60 CONCENTRIC DIFFUSER. REFER TO DETAIL FES-M-501.
2. EXISTING SUPPLY DIFFUSER ABANDONED IN PLACE (TYPICAL FOR 8).
3. EXISTING RETURN GRILLE ABANDONED IN PLACE (TYPICAL FOR 6).
4. EXISTING ELECTRIC THERMOSTAT INTERLOCKED WITH EXISTING CONVECTORS.
5. THERMOSTAT INTERLOCKED WITH RTU-1 ON ROOF ABOVE.
6. THERMOSTAT INTERLOCKED WITH RTU-2 ON ROOF ABOVE.
7. EXISTING 57X10 OA LOUVER.
8. HORIZONTAL UNIT VENTILATOR AT CEILING.
9. ¾" CONDENSATE DRAIN TO SPILLS ONTO SPLASH BLOCK AT GRADE.



1 GYMNASIUM PARTIAL PLAN INSTALLATION
SCALE: 3/32" = 1' - 0"

2 GYMNASIUM KEY PLAN
SCALE: NONE

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

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Project No. 42052
Scale AS NOTED
Date 7/29/22

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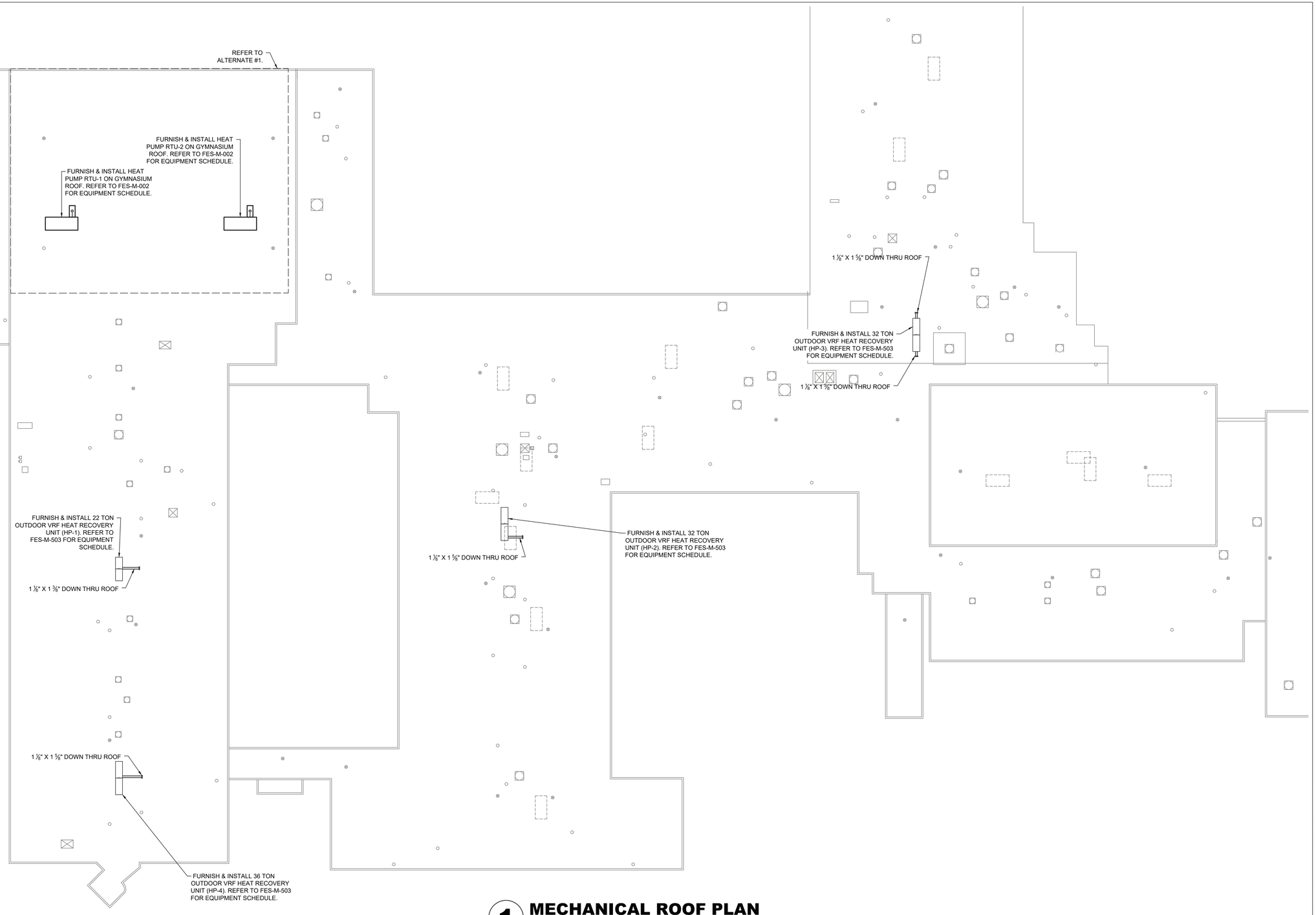
Drawing Title
HVAC INSTALLATION GYMNASIUM PLAN

Drawing No.
FES-M-104



1 MECHANICAL ROOF PLAN
SCALE: 1/16" = 1'0"

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

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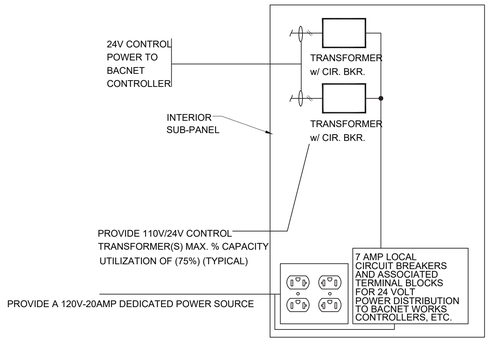
Drawing Title
MECHANICAL ROOF PLAN

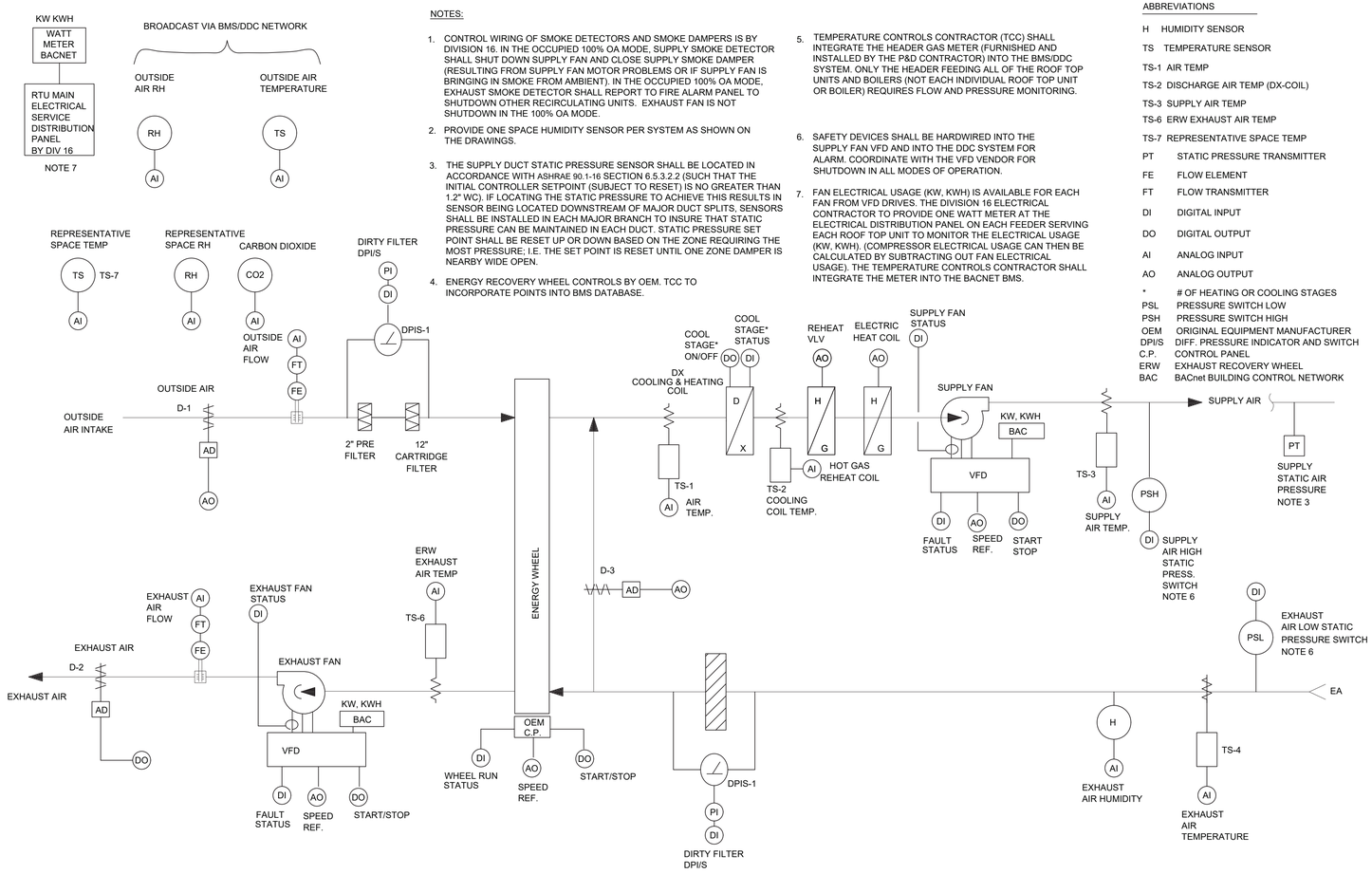
Drawing No.
FES-M-105



NOTE:

1. THE TCC SHALL PROVIDE 24VAC TO THOSE MISC. CONTROL DEVICES WHICH ARE NOT POWERED DIRECTLY FROM A UNITARY HVAC SYSTEM. COORDINATE WITH MECHANICAL CONTRACTOR AND EQUIPMENT VENDORS FOR CONTROL DEVICE POWER.
2. THE DISTRICT SHALL PROVIDE ETHERNET DROPS TO EACH PANEL.

1 DDC CONTROL PANEL INSTALLATION
SCALE: NONE



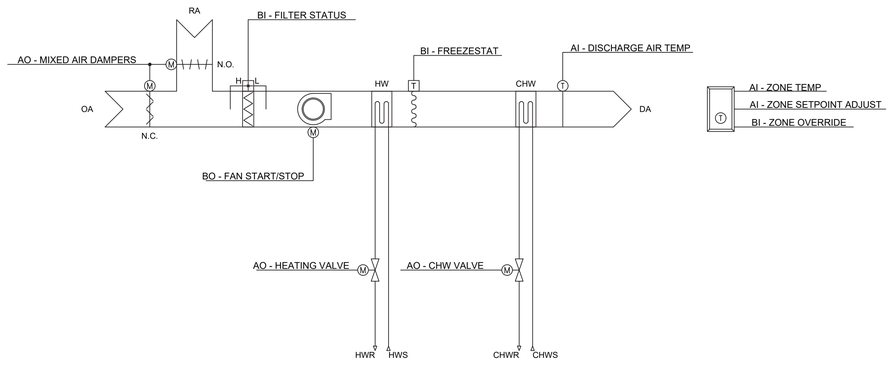
NOTES:

1. CONTROL WIRING OF SMOKE DETECTORS AND SMOKE DAMPERS IS BY DIVISION 16. IN THE OCCUPIED 100% OA MODE, SUPPLY SMOKE DETECTOR SHALL SHUT DOWN SUPPLY FAN AND CLOSE SUPPLY SMOKE DAMPER (RESULTING FROM SUPPLY FAN MOTOR PROBLEMS OR IF SUPPLY FAN IS BRINGING IN SMOKE FROM AMBIENT). IN THE OCCUPIED 100% OA MODE, EXHAUST SMOKE DETECTOR SHALL REPORT TO FIRE ALARM PANEL TO SHUTDOWN OTHER RECIRCULATING UNITS. EXHAUST FAN IS NOT SHUTDOWN IN THE 100% OA MODE.
2. PROVIDE ONE SPACE HUMIDITY SENSOR PER SYSTEM AS SHOWN ON THE DRAWINGS.
3. THE SUPPLY DUCT STATIC PRESSURE SENSOR SHALL BE LOCATED IN ACCORDANCE WITH ASHRAE 90.1-16 SECTION 6.5.3.2.2 (SUCH THAT THE INITIAL CONTROLLER SETPOINT (SUBJECT TO RESET) IS NO GREATER THAN 1.2" WC). IF LOCATING THE STATIC PRESSURE TO ACHIEVE THIS RESULTS IN SENSOR BEING LOCATED DOWNSTREAM OF MAJOR DUCT SPLITS, SENSORS SHALL BE INSTALLED IN EACH MAJOR BRANCH TO INSURE THAT STATIC PRESSURE CAN BE MAINTAINED IN EACH DUCT. STATIC PRESSURE SET POINT SHALL BE RESET UP OR DOWN BASED ON THE ZONE REQUIRING THE MOST PRESSURE; I.E. THE SET POINT IS RESET UNTIL ONE ZONE DAMPER IS NEARBY WIDE OPEN.
4. ENERGY RECOVERY WHEEL CONTROLS BY OEM. TCC TO INCORPORATE POINTS INTO BMS DATABASE.
5. TEMPERATURE CONTROLS CONTRACTOR (TCC) SHALL INTEGRATE THE HEADER GAS METER (FURNISHED AND INSTALLED BY THE P&D CONTRACTOR) INTO THE BMS/DDC SYSTEM. ONLY THE HEADER FEEDING ALL OF THE ROOF TOP UNITS AND BOILERS (NOT EACH INDIVIDUAL ROOF TOP UNIT OR BOILER) REQUIRES FLOW AND PRESSURE MONITORING.
6. SAFETY DEVICES SHALL BE HARDWIRED INTO THE SUPPLY FAN VFD AND INTO THE DDC SYSTEM FOR ALARM. COORDINATE WITH THE VFD VENDOR FOR SHUTDOWN IN ALL MODES OF OPERATION.
7. FAN ELECTRICAL USAGE (KW, KWH) IS AVAILABLE FOR EACH FAN FROM VFD DRIVES. THE DIVISION 16 ELECTRICAL CONTRACTOR TO PROVIDE ONE WATT METER AT THE ELECTRICAL DISTRIBUTION PANEL ON EACH FEEDER SERVING EACH ROOF TOP UNIT TO MONITOR THE ELECTRICAL USAGE (KW, KWH). (COMPRESSOR ELECTRICAL USAGE CAN THEN BE CALCULATED BY SUBTRACTING OUT FAN ELECTRICAL USAGE). THE TEMPERATURE CONTROLS CONTRACTOR SHALL INTEGRATE THE METER INTO THE BACNET BMS.

ABBREVIATIONS

H	HUMIDITY SENSOR
TS	TEMPERATURE SENSOR
TS-1	AIR TEMP
TS-2	DISCHARGE AIR TEMP (DX-COIL)
TS-3	SUPPLY AIR TEMP
TS-6	ERW EXHAUST AIR TEMP
TS-7	REPRESENTATIVE SPACE TEMP
PT	STATIC PRESSURE TRANSMITTER
FE	FLOW ELEMENT
FT	FLOW TRANSMITTER
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
*	# OF HEATING OR COOLING STAGES
PSL	PRESSURE SWITCH LOW
PSH	PRESSURE SWITCH HIGH
OEM	ORIGINAL EQUIPMENT MANUFACTURER
DPI/S	DIFF. PRESSURE INDICATOR AND SWITCH
C.P.	CONTROL PANEL
ERW	EXHAUST RECOVERY WHEEL
BAC	BACnet BUILDING CONTROL NETWORK

2 RTU-1 & RTU-2 CONTROL DIAGRAM
SCALE: NOT TO SCALE



3 UNIT VENTILATOR CONTROL DIAGRAM
SCALE: NONE

No.	Revisions	Date
REV 3	BIDDING DOCUMENTS	09-14-23

Drawn by AMW
Checked by PV
Project No. 42052
Scale AS NOTED
Date 7/29/22

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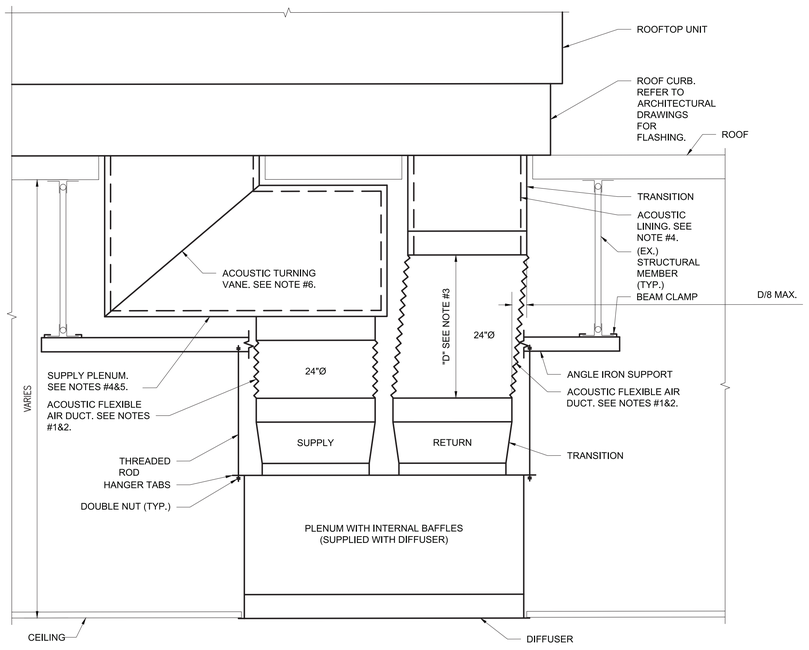
Drawing Title **CONTROL DIAGRAMS**

Drawing No. **FES-M-401**

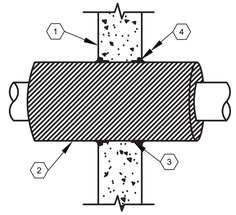


NOTES:
1. PROVIDE A UL LISTED ACOUSTIC FLEXIBLE AIR DUCT FACTORY COMPOSED OF A RESILIENT CALENDARED FILM LINER DUCT PERMANENTLY BONDED TO A COATED SPRING STEEL WIRE HELIX AND SUPPORTING A FIBERGLASS INSULATING BLANKET WITH LOW PERMEABILITY OUTER VAPOR BARRIER OF FIBERGLASS REINFORCED FILM LAMINATE. DUCT SHALL BE 24"Ø UNLESS OTHERWISE NOTED ON THE PLANS. BASIS OF DESIGN, THERMAFLEX M-KE.
2. MAXIMUM OFFSET FOR FLEXIBLE DUCT SHALL BE 1/8 OF ITS INSTALLED LENGTH. USE ROUND, LONG RADIUS GALVANIZED STEEL ELBOWS IF A GREATER OFFSET IS REQUIRED. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
3. FLEXIBLE DUCT SHALL BE LIMITED TO 5 FEET IN LENGTH.
4. DUCT SHALL BE INTERNALLY LINED WITH 1" THICK ACOUSTIC FIBERGLASS DUCT LINER (JOHNS MANVILLE LINACOUSTIC RC-HP OR EQUAL).
5. CLEAR INSIDE DIMENSIONS OF SUPPLY PLENUM SHALL BE 24"X24" MINIMUM.
6. PROVIDE 4" DOUBLE WALL ACOUSTIC TURNING VANES WHERE SHOWN (DUCTMATE 4AVGA24 OR EQUAL).

1 CONCENTRIC DIFFUSER DETAIL
SCALE: 1" = 1'0" REFER TO ALTERNATE #1

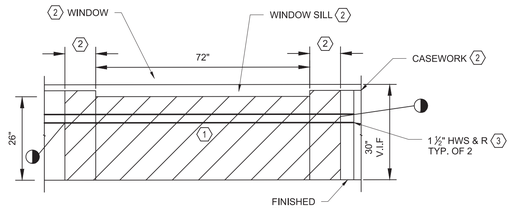
NOTE:
1. SLOPE PIPING 1/8" PER FOOT TOWARD DRAIN. TERMINATE WITHIN 6" OF THE NEAREST ROOF DRAIN.
2. FOR DRAW THROUGH UNITS: H1= NEGATIVE STATIC PRESSURE OF FAN + 1" MIN. H2=H1.
3. MINIMUM PIPE SIZES SHALL BE AS FOLLOWS:
   a. FOR EQUIPMENT UP TO 20 TONS REFRIGERATION: 3/4"
   b. FOR EQUIPMENT OVER 20 TONS UP TO 40 TONS REFRIGERATION: 1".
4. CONNECT THE CONDENSATE DRAIN TO THE EXISTING CONDENSATE DRAIN PIPING AT EACH UNIT VENTILATOR AND FAN COIL UNIT.

6 CONDENSATE TRAP
SCALE: N.T.S.



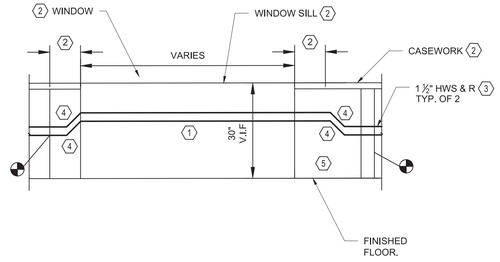
1. CONCRETE OR CONCRETE BLOCK WALL
2. STEEL OR IRON PIPE TO 12" OR COPPER PIPE UP TO 6" WITH UP TO 3" FIBERGLASS OR MINERAL WOOL INSULATION
3. WRAP STRIP. WRAP PRODUCT AROUND PIPE, SECURE WITH STEEL TIE WIRE, AND RECESS 1-3/4" INTO WALL CAVITY
4. SEALANT. INSTALL 1/4" BEAD AROUND WRAP STRIP/INSULATION INTERSTICES. ANNULUS AFTER INSTALLATION OF WRAP STRIP(S) SHALL RANGE FROM POINT CONTACT TO 1/4" MAXIMUM

7 PIPE THRU MASONRY WALL
SCALE: N.T.S.



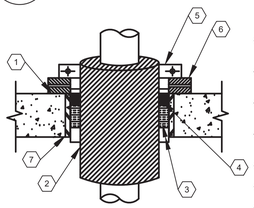
NOTES:
1. DEMOLISH EXISTING NESBITT UNIT VENTILATOR.
2. REFER TO ARCHITECTURAL DRAWINGS.
3. REMOVE APPROX. 10 LF OF HWS & HWR PIPING SERVING THE FINNED TUBE RADIATORS PER UNIT VENTILATOR. CUT BACK THE ALUMINUM FINS AS NEEDED.

2 UNIT VENTILATOR DEMOLITION
SCALE: 1/2" = 1'0"



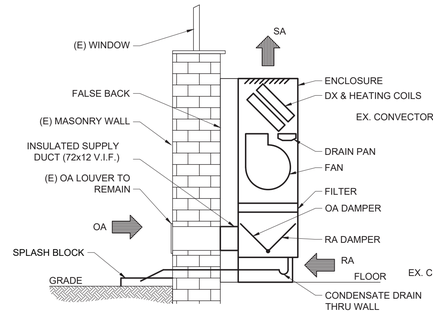
NOTES:
1. INSTALL NEW UNIT VENTILATOR. REFER TO SCHEDULE FOR DIMENSIONS.
2. REFER TO ARCHITECTURAL DRAWINGS.
3. PROVIDE APPROX. 10 LF OF HWS & HWR PIPING SERVING THE EXISTING FINNED TUBE RADIATORS. RUN WITHIN THE UNIT VENTILATOR'S INTEGRAL PIPE CHASE.
4. OFFSET PIPING WITH 45 DEGREE ELBOWS ONLY IF NEEDED.
5. 12" ± EXTENSION FOR LINEAR EXPANSION VALVE.

3 UNIT VENTILATOR INSTALLATION
SCALE: 1/2" = 1'0"



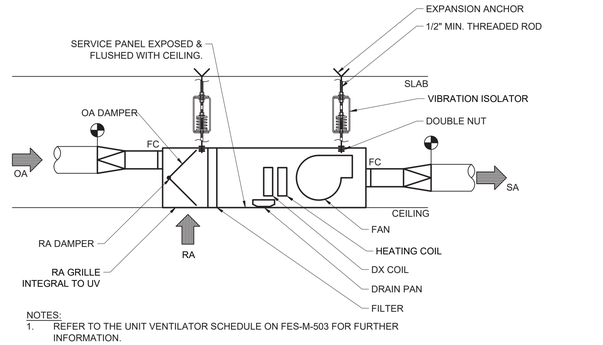
1. CONCRETE SLAB OR CONCRETE OVER STEEL DECK.
2. STEEL, IRON OR COPPER PIPE WITH UP TO 2" THICK FIBERGLASS INSULATION.
3. TIGHTLY PACKED MINERAL WOOL, NOMINAL 4 PCF, TO A 3" DEPTH.
4. SEALANT INSTALLED TO A 1" DEPTH. ANNULUS RANGING FROM 1/4" MINIMUM TO 3" MAXIMUM.
5. STANDARD PIPE CLAMP.
6. STEEL BEARING PLATE.
7. STEEL SLEEVE

4 PIPE THRU FLOOR
SCALE: N.T.S.



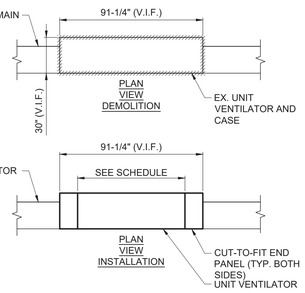
NOTES:
1. DEMOLITION: REMOVE THE EXISTING UNIT VENTILATOR WHERE SHOWN ON THE PLANS. THE EXISTING OUTSIDE AIR LOUVER AND WALL SLEEVE SHALL REMAIN.
2. CONSTRUCTION: PROVIDE THE UNIT VENTILATOR IN THE SAME LOCATION AS EXISTING WHERE SHOWN ON THE PLANS. CONNECT THE OUTSIDE AIR DUCT TO THE EXISTING OUTSIDE AIR LOUVER AND WALL SLEEVE. PROVIDE A LOW-LEAKAGE DAMPER, END PANELS, AND SUB-BASE AS NECESSARY FOR A COMPLETE INSTALLATION. VERIFY MEASUREMENTS IN FIELD PRIOR TO FABRICATION.

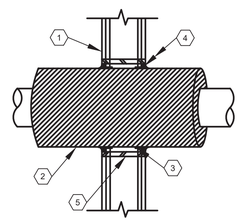
8 UNIT VENTILATOR DETAILS
SCALE: N.T.S.



NOTES:
1. REFER TO THE UNIT VENTILATOR SCHEDULE ON FES-M-503 FOR FURTHER INFORMATION.

5 CEILING RECESSED UNIT VENTILATOR
SCALE: N.T.S.





1. CONCRETE OR CONCRETE BLOCK WALL
2. STEEL OR IRON PIPE TO 12" OR COPPER PIPE UP TO 6" WITH UP TO 3" FIBERGLASS OR MINERAL WOOL INSULATION
3. WRAP STRIP. WRAP PRODUCT AROUND PIPE, SECURE WITH STEEL TIE WIRE, AND RECESS 1-¾" INTO WALL CAVITY
4. SEALANT. INSTALL ¼" BEAD AROUND WRAP STRIP/INSULATION INTERSTICES. ANNULUS AFTER INSTALLATION OF WRAP STRIP(S) SHALL RANGE FROM POINT CONTACT TO ¼" MAXIMUM
5. STEEL SLEEVE

9 PIPE THRU GWB WALL
SCALE: N.T.S.

No.	Date	Revisions
REV 3	09-14-23	BIDDING DOCUMENTS
REV 2	06-09-23	SED ADDENDUM #1
REV 1	12-28-22	BIDDING DOCUMENTS

REG. EXP. DATE: 04-30-24

Drawn by	AMW
Checked by	PV
Project No.	42052
Scale	AS NOTED
Date	7/29/22

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Mechanical & Electrical Engineer:

Structural Engineer:

UNIVENT REPLACEMENT AT FARLEY ELEMENTARY SCHOOL
SED # 50-02-01-06-0-003-011
COUNTY OF ROCKLAND

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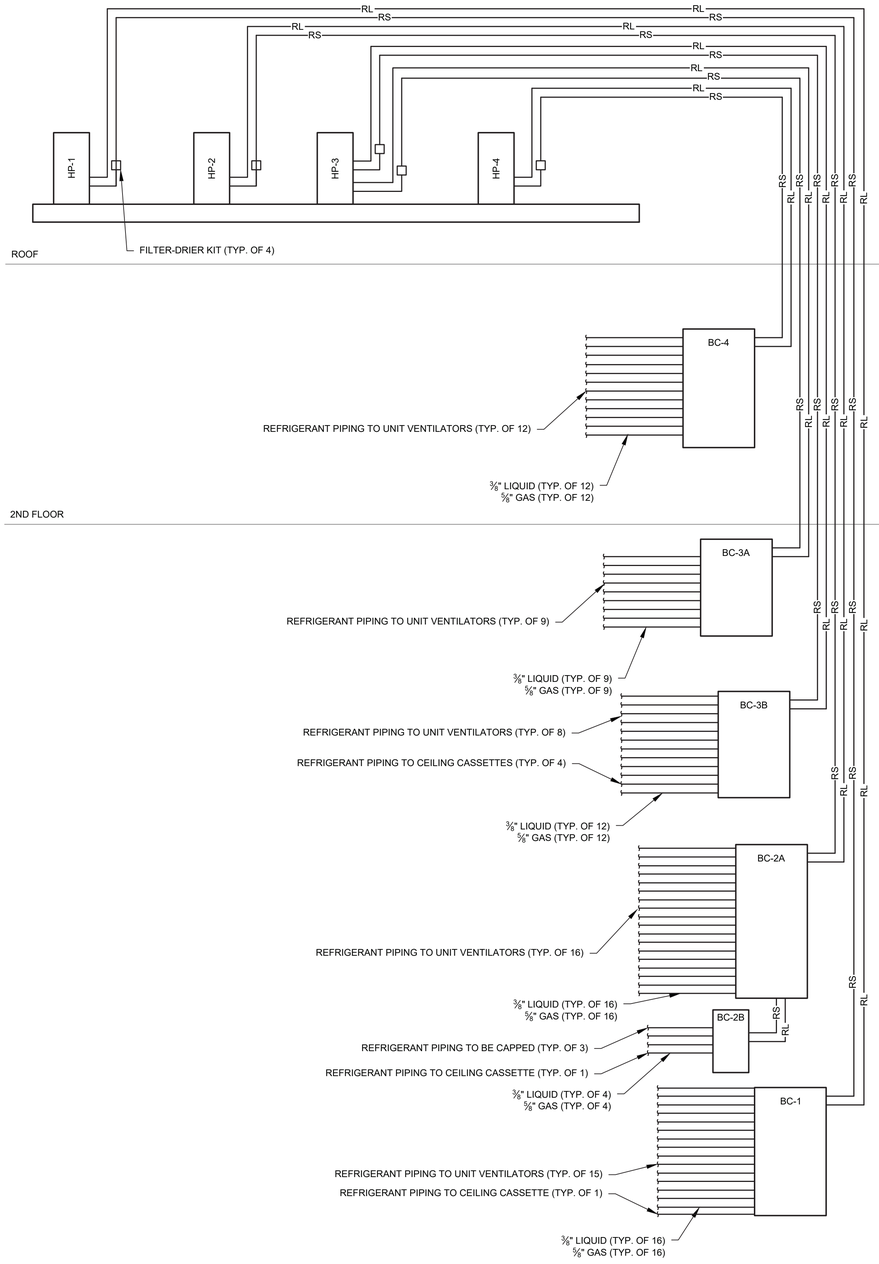
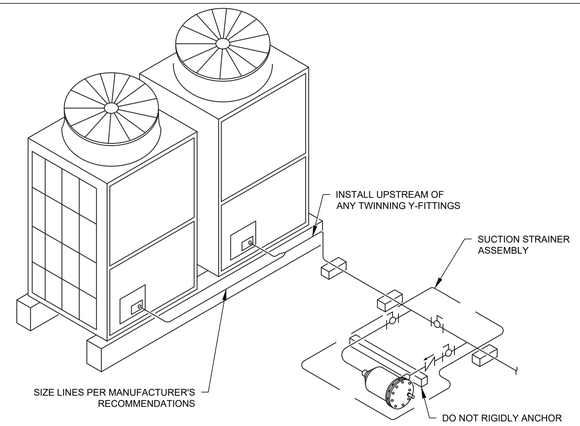
Drawing Title
MECHANICAL DETAILS - 1

Drawing No.
FES-M-501

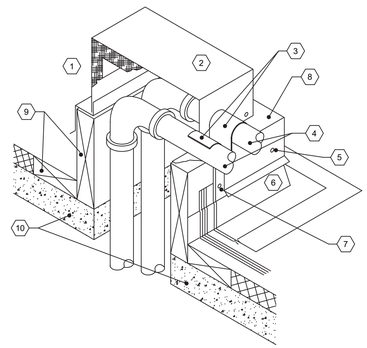


1 REFRIGERANT PIPING DIAGRAM
SCALE: N.T.S.

NOTE:
1. REFRIGERANT PIPE SIZES ARE SHOWN HERE FOR REFERENCE ONLY. PIPE SIZES SHALL BE CALCULATED BY THE VRF SYSTEM MANUFACTURER BASED ON THE ACTUAL LAYOUT, AND THE MANUFACTURER'S EQUIPMENT AND PIPING SELECTIONS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION AND INSTALLATION.
2. RUN CONDENSATE PIPING AS PER THE AHU MANUFACTURER'S RECOMMENDATIONS. TERMINATE AT THE NEAREST FLOOR DRAIN OR CONNECT TO THE SANITARY DRAINAGE SYSTEM WITH AN AIR GAP FITTING UNLESS OTHERWISE NOTED.

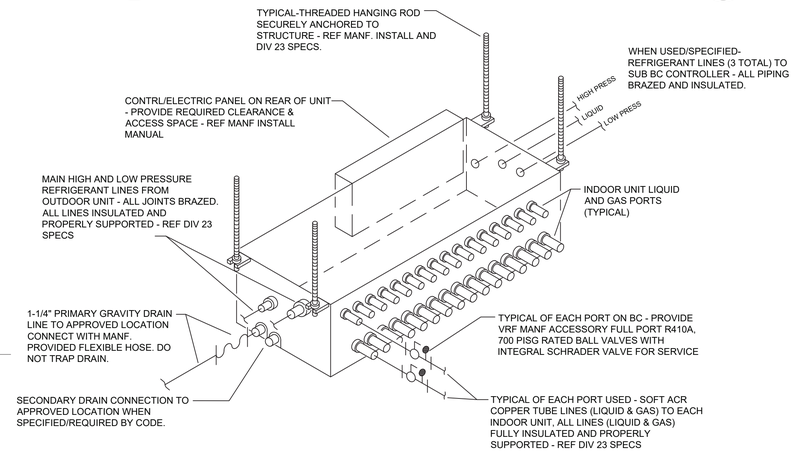


2 PIPING AT HP-1, HP-2, HP-3 & HP-4
SCALE: N.T.S.



1. INSULATE INSIDE OF HOOD
2. SHEET METAL HOOD
3. SHEET METAL OR FLEX-TUBE COLLAR
4. SLOPE PIPES AWAY FROM HOOD
5. FASTENERS (BY GC)
6. BASE FLASHING
7. FASTENERS (BY GC)
8. CAP FLASHING
9. WOOD BLOCKING
10. EXISTING CONCRETE DECK

3 ROOFTOP PIPE PENETRATION
SCALE: N.T.S.



4 BC CONTROLLER DETAIL
SCALE: N.T.S.

5 PIPING AT UNIT VENTILATOR
SCALE: N.T.S.

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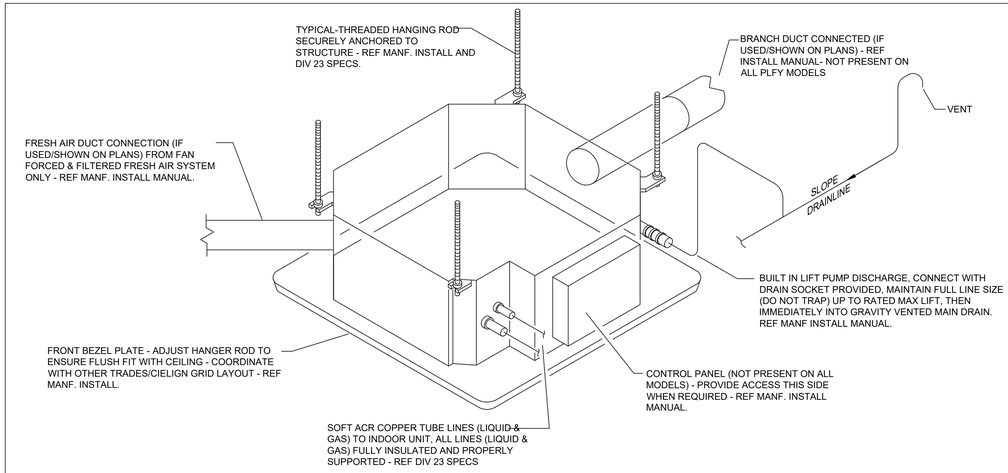
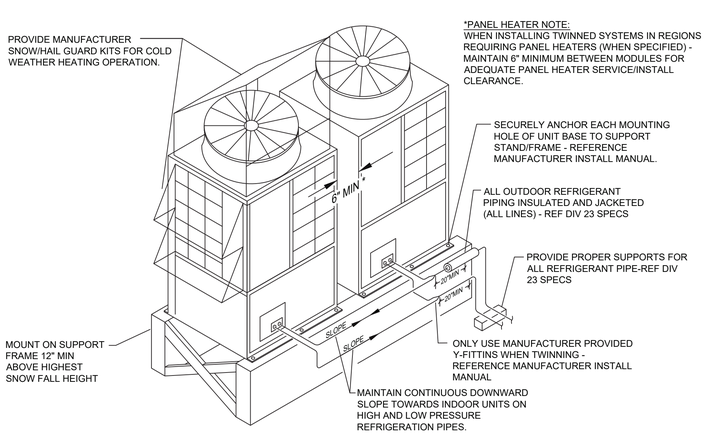
Drawing Title
MECHANICAL DETAILS - 2

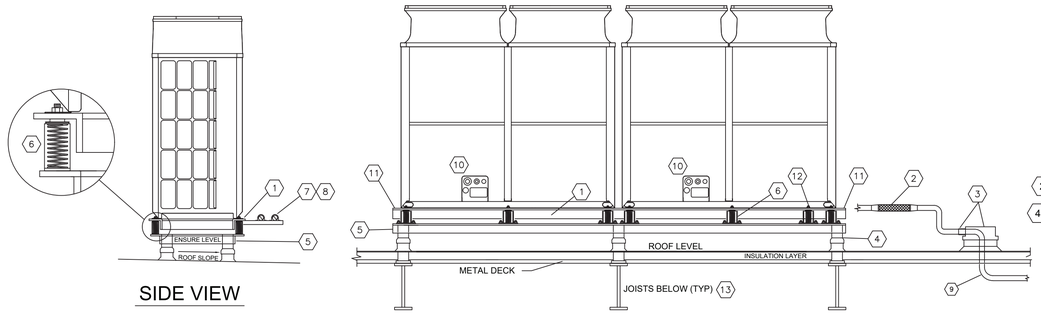
Drawing No.
FES-M-502



1 CEILING CASSETTE INSTALLATION DETAIL
SCALE: N.T.S.



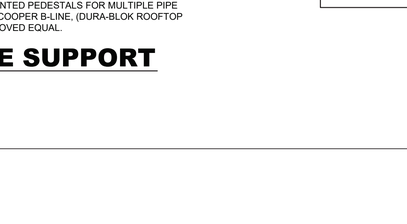
2 VRF OUTDOOR UNIT TWINNING DETAIL
SCALE: N.T.S.



CODED NOTES:

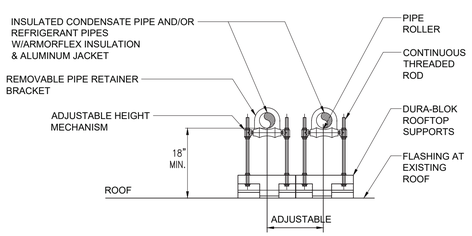
1. PROVIDE STRUCTURAL INTERSTITIAL ANGLE IRON MOUNTING MEMBER OR SIMILAR ATTACHED DIRECTLY TO BOTTOM OF UNIT MOUNTING FLANGE AND PROVIDE CROSS BRACING FOR RIGIDITY. ENSURE IT CARRIES FULL MOUNTING FOOT WIDTH ON UNIT. FINAL SPECIFICATION OF MEMBER BY STRUCTURAL ENGINEER OF RECORD.
2. PROVIDE BRAIDED COPPER FLEXIBLE CONNECTOR, R410A RATED, 650PSI MAX WORKING PRESSURE, PACKLESS INDUSTRIES OR EQUAL ON ALL MAIN PIPING DOWNSTREAM OF TWINNING KITS/CONVERGING FITTINGS PRIOR TO PENETRATION THROUGH ROOF.
3. PIPE ROOF CURB, FLASHED AND SEALED WATER TIGHT, PROVIDE FLEXIBLE WATER TIGHT COLLAR TO ALLOW FOR MOVEMENT WHERE PIPE ENTERS CURB. DO NOT ENTER PIPE CURB FROM VERTICAL DIRECTION.
4. TYPICAL BASE SUPPORT POSTS, SECURELY ANCHORED TO BUILDING STRUCTURE BELOW, QUANTITY, SIZE, AND CARRYING CAPACITY DETERMINED BY STRUCTURAL ENGINEER OF RECORD.
5. STRUCTURAL ANGLE IRON BASE MOUNTING FRAME WITH CROSS MEMBERS FOR RIGIDITY - FINAL SIZING BY STRUCTURAL ENGINEER OF RECORD.
6. VIBRATION SPRING SLR TYPE ISOLATORS (MASON INDUSTRIES OR EQUIV.) WITH RUBBER BASE PADS, SECURELY FASTENED TO STRUCTURAL BASE AND TO VRF UNIT INTERSTITIAL SUPPORT STEEL. SPRING ISOLATOR TO PROVIDE MINIMUM 1" DEFLECTION OR 10 TIMES THE STATIC DEFLECTION OF THE ROOF DECK FROM EQUIPMENT WEIGHT - DETERMINED BY STRUCTURAL ENGINEER OF RECORD. AT A MINIMUM, PROVIDE SPRING ISOLATORS AT EACH EQUIPMENT BASE MOUNTING HOLE LOCATION.
7. IF REQUIRED, ONLY SUPPORT LATERAL PIPE EMANATING FROM VRF UNIT CONNECTIONS BY CROSS MEMBER SUPPORT THAT IS ATTACHED DIRECTLY TO VRF UNIT MOUNTING ANGLE IRON FRAME ABOVE SPRING ISOLATORS. DO NOT ATTACH ANY PIPING TO LOWER FIXED SUPPORT BASE.
8. USE NEOPRENE ISOLATION COLLARS ON PIPE CLAMS WHEN FASTENING PIPING TO SUPPORTS.
9. USE LONG RADIUS SWEEPING COPPER ACR TUBE PIPE BENDS WHERE PIPE ENTERS BUILDING AT FIRST ELBOW INTO CEILING SPACE TO MINIMIZE REFRIGERANT FLOW NOISE AND VIBRATION.
10. ALL ELECTRICAL CONNECTIONS TO UNITS TO BE VIA FLEXIBLE CONDUIT, PROVIDE SUFFICIENT SLACK TO ALLOW FOR UNIT MOVEMENT ON SPRING ISOLATORS.
11. ENSURE CROSS MEMBERS OF INTERSTITIAL FRAME AND BOTTOM SUPPORT FRAME ARE NOT DIRECTLY BELOW ENDS OF MODULES IN ALL LOCATIONS AND DO NOT BLOCK DRAINAGE WEEP HOLES IN BOTTOM OF UNIT CASING, FAILURE TO DO THIS MAY RESULT IN ICE DAMMING/BUILDUP BENEATH UNIT AND SUBSEQUENT BUILDUP OF ICE IN BOTTOM OF UNIT CASING BELOW COIL AND POTENTIAL DAMAGE TO BOTTOM OF COIL.
12. WHEN SELECTING SPRING ISOLATORS ALWAYS CONSIDER WEIGHT DISTRIBUTION BY REFERENCING EQUIPMENT WEIGHT AND CENTER OF GRAVITY. NEAR RIGHT ENDS OF UNITS (VIEWED FROM FRONT PANEL) SPRING WEIGHT CAPACITY MAY BE LARGER. IF HIGHER SPRING WEIGHT CAPACITY IS REQUIRED VS OTHER SPRING LOCATIONS, CONSIDER AN ADDITIONAL SPRING OF EQUAL "K" VALUE (lbs/in) NEAR RIGHT END OF LAST MODULE. IN GENERAL IT IS RECOMMENDED TO SELECT ALL MOUNTING SPRINGS OF EQUIVALENT "K" VALUE (lbs/in).
13. REFER TO THE STRUCTURAL DRAWINGS (SPECIFICALLY S102) FOR INSTALLATION REQUIREMENTS AND DETAILS OF THE EXISTING ROOF STRUCTURE.

3 VRF OUTDOOR UNIT MOUNTING DETAIL
SCALE: N.T.S.



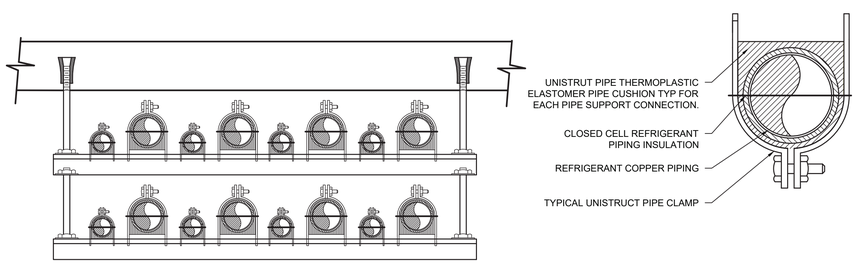
1. VIBRATION ISOLATOR PER SECTION 15504 BOLTED TO STEEL BEAM. PROVIDE ISOLATORS FOR USE OUTDOORS. (TYP OF 4)
2. COUNTER FLASHING OVER TREATED WOOD NAILER
3. GALVANIZED STEEL, MIN. 18 GAGE WITH WELDED SEAMS
4. RAIL
5. MINIMUM 3 5/8"
6. MINIMUM 102" U.O.N.
7. GALVANIZED STEEL BEAM OR STRUT CHANNEL ATTACHED TO RAIL.

4 VRF ROOFTOP SUPPORT RAIL DETAIL
SCALE: N.T.S.

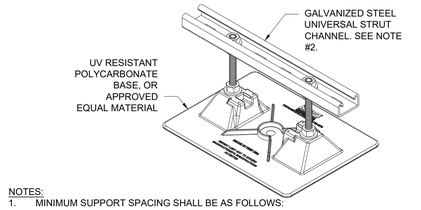


NOTE:
FURNISH AND INSTALL PIPE MOUNTED PEDESTALS FOR MULTIPLE PIPE SUPPORTS MANUFACTURED BY COOPER B-LINE, (DURA-BLOK ROOFTOP SUPPORTS) DB SERIES OR APPROVED EQUAL.

5 ROOF PIPE SUPPORT
SCALE: N.T.S.



7 REFRIGERANT PIPING DETAIL
SCALE: N.T.S. NOTE: PROVIDE SUPPORT 12 FT ON CENTER



NOTES:
1. MINIMUM SUPPORT SPACING SHALL BE AS FOLLOWS:
   a. COPPER TUBE (1 1/4" AND SMALLER): 6'-0" O.C.
   b. COPPER TUBE (1 1/2" AND LARGER): 10'-0" O.C.
   c. PVC: 4'-0" O.C.
   d. FOR SIZES AND MATERIALS NOT LISTED ABOVE, COMPLY WITH 2015 MCNYS 305.4.
2. VERIFY IN FIELD REQUIRED STRUT CHANNEL HEIGHT. SECURE PIPING TO CHANNEL USING CLAMP CONSTRUCTED OF COMPATIBLE MATERIAL.
3. BASIS OF DESIGN: MIRO IND. MODEL 2.5-CS.

6 SUPPORT FOR ROOFTOP CONDENSATE PIPING
SCALE: N.T.S.

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Drawing Title
MECHANICAL DETAILS - 3

Drawing No.
FES-M-503