

## HVAC NOTES:

- THE WORK SHALL COMPLY WITH THE 2020 BUILDING CODE OF NYS. IN ADDITIONS, THE WORK SHALL COMPLY WITH ALL OTHER RELEVANT CODES, RULES AND ORDINANCES OF THIS STATE OF NEW YORK, ALL LOCAL, STATE AND FEDERAL AUTHORITIES HAVING JURISDICTION.
- CONTRACTOR SHALL PAY ALL FEES AND TAXES, OBTAIN ALL PERMITS AND APPROVALS, FILE THE REQUIRED DOCUMENTS AND CAUSE ALL INSPECTIONS.
- CONTRACTOR SHALL PROVIDE ALL WORK, EQUIPMENT, LABOR AND MATERIAL REQUIRED FOR A COMPLETE AND TROUBLE FREE INSTALLATION.
- ALL DUCTWORK ELBOWS SHALL BE EITHER LONG RADIUS OR SQUARE WITH TURNING VANES.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT, PIPING, CONTROLS, DUCTWORK, REGISTERS, SUPPORTS, DAMPERS, AND ACCESSORIES PRIOR TO FABRICATION AND INSTALLATION. SUBMIT ALL REPORTS FOR REVIEW SUCH AS TESTING, ADJUSTING, AND COMMISSIONING.
- CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS AND NOTIFY OWNER OF ANY DISCREPANCIES BEFORE COMMENCING WORK.
- PROVIDE AN AIR BALANCE REPORT FOR THE EQUIPMENT SHOWN ON THE DRAWINGS.
- ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER.
- EXCEPT AS NOTED, ALL MATERIAL AND EQUIPMENT SHALL BE NEW AND IN GOOD CONDITION, WHERE APPLICABLE BY CODE AND/OR THESE SPECIFICATIONS, EQUIPMENT AND MATERIALS SHALL BE LABELED BY THE REQUISITE GOVERNING AGENCY.
- SURVEY THE INSTALLATION SITE PRIOR TO BID, DETERMINE THE CONSTRAINTS OF THE EXISTING AVAILABLE SPACE PERTAINING TO EQUIPMENT SIZE AND CONFIGURATION AND EXAMINE THE CONDITIONS UNDER WHICH THE EQUIPMENT WILL BE INSTALLED. VERIFY ALL MEASUREMENTS AT THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DIMENSIONAL COMPATIBILITY OF THE DUCTWORK AND EQUIPMENT WITH THE SPACE.
- SHIP AND DELIVER EQUIPMENT KNOCKED DOWN AS NECESSARY TO FIT THROUGH EXISTING BUILDING OPENINGS. VERIFY IN FIELD THE CONSTRAINTS OF THE EXISTING BUILDING PRIOR TO FABRICATION OF EQUIPMENTS. INCLUDE IN THE BID ALL COSTS ASSOCIATED WITH RIGGING AND DELIVERY OF EQUIPMENT AS REQUIRED BY THE EXISTING BUILDING CONDITIONS.
- SCHEDULE AND NOTIFY THE OWNER AND BUILDING MANAGEMENT IN ADVANCE PRIOR TO SHUTDOWN OF ANY SERVICES.
- UPON COMPLETION OF THE PROJECT, PROVIDE SIX (6) COPIES OF AS-BUILT DRAWINGS TO THE OWNER.
- IT IS THE INTENT OF THESE CONTRACT DOCUMENTS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IF AN ITEM OF WORK IS SHOWN ON THE DRAWINGS, IT SHALL BE CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION, WHETHER SPECIFICALLY MENTIONED OR NOT.
- RENDER FULL COOPERATION TO OTHER TRADES AND COORDINATE THE WORK WITH OTHER TRADES. THIS CONTRACTOR SHALL ASSIST IN WORKING OUT SPACE CONDITIONS.
- PERFORM ALL CUTTING AND PATCHING NECESSARY FOR THE PROPER INSTALLATION OF THIS WORK. REPAIR ANY DAMAGE DONE BY THIS WORK AND REPAIR ANY DAMAGE CAUSED.
- ON ACCEPTANCE OF CONTRACT, CONTRACTOR AGREES TO GUARANTEE THE WORK AND EQUIPMENT FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM DATE OF INITIAL OPERATION. MANUFACTURED EQUIPMENT SHALL CARRY FULL PERIOD OF MANUFACTURER'S GUARANTEE, AND SHALL NOT BE LESS THAN ONE (1) YEAR. COMPRESSORS SHALL CARRY AN EXTENDED WARRANTY OF FIVE YEARS.

## GENERAL NOTES:

- 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 TRADES IN ORDER TO RESOLVE ALL CONFLICTS WITHOUT IMPEDING THE JOB PROGRESS.
- EXAMINE THE DRAWINGS OF 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 SECTION AND ANY OTHER SECTIONS OF THEIR RESPONSIBILITIES TO PERFORM THE WORK REQUIRED FOR A COMPLETE FULLY OPERATIONAL AND SATISFACTORY INSTALLATION.
- THE WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING SYSTEMS, EQUIPMENT AND SERVICES, AS SPECIFIED HEREBY. STARTUP SERVICES FOR ALL ROOFTOP UNITS INSTALLED IN THIS CONTRACT SHALL BE INCLUDED IN THE BID.
- ALL SYSTEMS, EQUIPMENT AND SERVICES SPECIFIED HEREIN SHALL BE PROVIDED COMPLETE AND READY FOR USE. ALL EQUIPMENT, DUCTWORK, PIPING, DAMPERS ARE NEW, FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE NOTED.
- 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 SERVICE, INCLUDE THOSE OF OTHER SUBCONTRACTORS IS REQUIRED. PRICE COORDINATION DRAWINGS SHOWING ALL TRADES WORK AND EXISTING CONDITION.
- EXTEND ALL GREASE FITTINGS TO AN ACCESSIBLE LOCATION.
- FOR ACCESS DOORS TO VALVES, DAMPERS AND ALL OTHER HVAC TYPE OF ITEMS, ACCESSORIES AND EQUIPMENT, CONCEALED IN WALLS, FURRINGS AND CEILINGS. DOOR SHALL PERMIT FULL ACCESS TO THE EQUIPMENT.
- VERIFY FINAL LOCATIONS FOR ROUGH WORK WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT BEING CONNECTED.
- ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER BUILDING COMPONENTS TO ALLOW FOR HVAC INSTALLATIONS.
- COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SIZE OF SLEEVES TO BE SET IN POURED CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED.
- COORDINATE THE INSTALLATION OF HVAC MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, LIGHT FIXTURES, AND ALL OTHER INSTALLATIONS AND ACCESSORIES.
- PROVIDE EQUIPMENT AND SYSTEMS THAT, AS DEFINED HEREIN, SHALL BE QUIET AND FREE OF APPARENT VIBRATION IN OPERATIONS.
- OBTAIN EQUIPMENT THAT IS QUIET IN OPERATION AS COMPARED TO OTHER AVAILABLE EQUIPMENT OF ITS SIZE, CAPACITY, AND TYPE; INSTALL EQUIPMENT SO THAT A MINIMUM AMOUNT OF NOISE AND/OR VIBRATION IS TRANSMITTED TO THE BUILDING; AND FABRICATE THE DUCT SYSTEM SO THAT AIR NOISES GENERATED IN THE SYSTEM ARE HELD TO AN ABSOLUTE MINIMUM.
- 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.
- PROVIDE SEISMIC RESTRAINTS FOR ALL EQUIPMENT FURNISHED AS PART OF THIS CONTRACT. ANCHOR ALL EQUIPMENT FURNISHED BY OTHERS WHEN INSTALLATION IS CLAIMED BY THIS CONTRACT. DUCTWORK SHALL HAVE SUPPORTS, HANGERS, VIBRATION ISOLATORS, AND SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH CODE AND SMACNA STANDARDS.
- THE WORD "PROVIDE" USED ON DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT MEANS "FURNISH AND INSTALL". WHEN ONLY ONE PART OF ACTION IS REQUIRED, EITHER "FURNISH" OR "INSTALL" WILL BE USED ACCORDINGLY (TYP., U.O.N.).
- 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.
- IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO PROVIDE CONTROL WIRING TO THE BMS SYSTEM. MECHANICAL CONTRACTOR TO FURNISH THE SERVICES OF CONTROL CONTRACTOR TO PREPARE CONTROL WIRING DIAGRAMS.
- CONTRACTOR SHALL PROVIDE CURBS AND FACTORY ASSEMBLED PIPE CABINET FOR EACH AHU/PACKAGED RTU. REMOVE EXISTING GRAVEL AND COORDINATE NEW ROOF WORK WITH GC, SEE ARCHITECTURAL DRAWINGS.
- PERFORM COMMISSIONING OF THE INSTALLED AIR HANDLING EQUIPMENT AS PER 2020 NYS IECC C408. SEE SPEC 019113. SERVICES ARE TO BE PERFORMED BY A THIRD PARTY APPROVED AGENCY.
- FOR SEQUENCE OF OPERATIONS, SEE SPECIFICATION SECTION 230993.
- 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.
- 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 THE DISTRICT FACILITIES, OR AS NOTED TO BE RELOCATED ON THE DRAWINGS, AND SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.

## CONTROLS:

- THE BUILDING MANAGEMENT SYSTEM AND ALL DIRECT DIGITAL CONTROLS SHALL BE A BACNET BASED SYSTEM AND SHALL BE PROVIDED BY SIEMENS. THE CONTRACTOR SHALL RETAIN THE SERVICES OF SIEMENS TO PROVIDE THE SYSTEM. NO SUBSTITUTIONS ARE PERMITTED.

## BALANCING

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 INCLUDING, OUTSIDE, SUPPLY, EXHAUST, RETURN AIR, SUCTION AND DISCHARGE STATIC PRESSURE AND OPERATING TEMPERATURE DIFFERENCE AIR FLOW PERFORMANCE INCLUDING WATER SIDE ENTERING AND LEAVING PRESSURE DROP.

## ABBREVIATIONS

ABBREVIATION:	DESCRIPTION:
A	AMPERE
AC	AIR CONDITIONING
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AF	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
DI	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
GALL	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
IS COP	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
LPR	LOW PRESSURE STEAM RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LRA	LOCKED ROTOR AMPS
LWT	LEAVING WATER TEMPERATURE
AUXILIARY	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	1,000 BTU/H
MCA	MINIMUM CIRCUIT AMPACITY
MCOB	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
PHRESS	PRESSURE
PSI	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

## 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.

- REPLACE UNIT VENTILATORS THROUGHOUT THE BUILDING WHERE INDICATED. CONNECT ALL UNIT VENTILATORS TO THE CHILLED WATER PIPING SYSTEM. EXISTING CHILLED WATER PIPING IS TO BE RE-USED WHEREVER POSSIBLE.
- PROVIDE AN AIR-COOLED CHILLER COMPLETE WITH PUMPS, CONTROLS, AND APPURTENANCES AT THE NEW WINGS AND CONNECT THE EXISTING CHILLED WATER PIPING. THIS EXISTING CHILLED WATER PIPING WAS ORIGINALLY INSTALLED IN THE BUILDING FOR FUTURE CONNECTION, BUT WAS NOT CONNECTED TO A SOURCE OF CHILLED WATER AT THE TIME OF CONSTRUCTION. TEST THE EXISTING PIPING AS SPECIFIED PRIOR TO FABRICATION.
- PROVIDE AN AIR COOLED CHILLER AT THE SAME LOCATION AS THE EXISTING COOLING TOWER. DEMOLISH THE EXISTING COOLING TOWER AND TWO WATER COOLED CENTRIFUGAL CHILLERS. PROVIDE PUMPS, CONTROLS, PIPING, AND APPURTENANCES.
- REFURBISH THE TWO EXISTING AIR HANDLING UNITS AHU-1 AND AHU-2 ABOVE THE CEILING IN THE ORIGINAL WING. REPLACE THE VAV TERMINALS THROUGHOUT THIS AREA WITH PRESSURE INDEPENDENT, DDC VAV BOXES.
- REPLACE THE AIR HANDLING UNIT AHU-20 AT THE CEILING OF THE CAFETERIA.
- PROVIDE DX COOLING COILS AT THE FIVE EXISTING AIR HANDLING UNITS (AHU-3, 4, 5, 7, & 8) ADJACENT TO THE GYM. EACH COOLING COIL SHALL BE SERVED BY A DEDICATED SPLIT SYSTEM AIR CONDITIONING UNIT LOCATED ON THE ROOF DIRECTLY ABOVE.
- REPLACE THE EXISTING CLIMATE CONTROL SYSTEM WITH A DIRECT DIGITAL BUILDING MANAGEMENT SYSTEM. THE BMS SHALL BE PROVIDED BY SIEMENS TO MATCH THE OTHER BUILDINGS IN THE DISTRICT.

## 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
	CHILLED WATER SUPPLY (CHWS)
	CHILLED WATER RETURN (CHWR)
	CONDENSER WATER RETURN
	CONDENSER WATER SUPPLY
	HOT WATER RETURN
	HOT WATER SUPPLY
	REFRIGERANT
	DRAIN
	MAKE-UP WATER
	VENT
	TEMPERATURE SENSOR/THERMOSTAT
	HUMIDITY SENSOR
	VOLUME DAMPER
	SUPPLY DIFFUSER
	RETURN OR EXHAUST GRILLE

## HVAC DESIGN CRITERIA:

- SITE (BASED ON NEAREST AVAILABLE DATA: ASHRAE HANDBOOK CLIMATIC DESIGN INFORMATION, WESTCHESTER CO, NY):
  - 41.07°N, 73.71°W
  - ELEVATION: 397 FT
  - CLIMATE ZONE SA.
- OUTSIDE DESIGN CONDITIONS (BASED ON NEAREST AVAILABLE DATA: ASHRAE CLIMATIC DESIGN INFORMATION, WESTCHESTER CO, NY):
  - HEATING DB (99.6%): 9.0°F DB
  - COOLING DB/MCWB (1%): 86.5°F DB, 72.1°F WB
- INSIDE DESIGN CONDITIONS (PER NYSED MANUAL OF PLANNING STANDARDS S602-6 B. AND 2015 ASHRAE HANDBOOK CH 7 TABLE 6):
  - DESIGN REQUIREMENTS FOR HVAC SYSTEM NOISE FOR CLASSROOMS, 7-12: RC 25-30.
- ACOUSTICS (PER NYSED MANUAL OF PLANNING STANDARDS, TABLE S304-1):
  - DESIGN REQUIREMENTS FOR HVAC SYSTEM NOISE FOR CLASSROOMS, 7-12: RC 25-30.
- FILTRATION: MERV 13 (PER NYSED MANUAL OF PLANNING STANDARDS).

## ALTERNATES:

INCLUDE IN THE BID A SEPARATE PRICE FOR THE FOLLOWING:

- BASE BID: REUSE THE EXISTING UV'S SPECIFIED FOR REPLACEMENT AS PER ALT. NO. 200. REMOVE EXISTING COIL, FLIP AND CONNECT HEAT AND CHILLER LINES TO PROPER COILS. ALL OTHER EXISTING UV'S TO BE REPLACED WITH NEW.
- ALT. NO. 200: REPLACE EXISTING UV'S IN LOCATION SPECIFIED ON THE PLANS. SEE PLANS FOR LOCATIONS. INCLUDE AN ALLOWANCE TO REPLACE EXISTING HEAT SUPPLY & RETURN PIPING AND INSULATION FOR 20 LINEAR FEET PER EACH UNIT VENTILATOR TO BE REPLACED.
- ALT. NO. 201: REMOVE AND REPLACE CAFETERIA UNIT, AHU-20.
- ALT. NO. 202: REFURBISH EXISTING PLENUM MOUNTED HVAC UNIT AND PROVIDE NEW ACCESS PANELS AND MAINTENANCE PLATFORMS FOR AHU-1 AND AHU-2
- ALT. NO. 203: REFLECT THE ARCHITECTURAL DRAWINGS.
- ALT. NO. 204: REFER THE ARCHITECTURAL DRAWINGS.

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

REC. EXP. DATE: 04-30-24
--------------------------

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> Mechanical/Electrical Engineer	<b>GREENMAN PEDERSEN, INC</b> Structural Engineer
---	--

<b>UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL</b> SED# 50-02-01-06-0-030-016 US PROJECT NO. 1004 COUNTY OF ROCKLAND
---

<b>MISA</b> MICHAEL SHILALE ARCHITECTS, L.L.P. 140 Park Avenue New York, NY 10022 Tel 845-708-9200 www.misa.com
--

Drawing Title <b>MECHANICAL GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS</b>	Drawing No. <b>WGES-M-001</b>
--	----------------------------------

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.

WATER PUMP SCHEDULE																							
UNIT #	SERVICE	LOCATION	TYPE	FLUID	PUMP DATA								MOTOR				BASIS OF DESIGN						
					IMPELLER DIA. (IN)	CAPACITY (GPM)	TOTAL HEAD (FT H2O)	DUTY POINT POWER (HP)	NPSHr (FT H2O)	PART LOAD EFF. (PLEVv)	DUTY POINT EFF.	MAX. WWP (PSIG)	WATER TEMP. (°F)	TYPE	ENCLOSURE TYPE	HP	RPM	V/PHz	SPEED CONTROL	BASE DIMENSIONS (LxW, IN)	OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL #
CHWP-1	CHILLED WATER	OUTDOORS	BASE MOUNTED, END SUCTION	30% PROPYLENE GLYCOL	8.625	320	50	6.13	9.2	70.3	67.5	175	44	NEMA PREMIUM, VFD READY	TEFC	7.5	1800	208/3/60	VARIABLE	34x14	367	BELL & GOSSETT	e-1510 2.5BB
CHWP-2	CHILLED WATER	OUTDOORS	BASE MOUNTED, END SUCTION	30% PROPYLENE GLYCOL	8.625	320	50	6.13	9.2	70.3	67.5	175	44	NEMA PREMIUM, VFD READY	TEFC	7.5	1800	208/3/60	VARIABLE	34x14	367	BELL & GOSSETT	e-1510 2.5BB
CHWP-3	CHILLED WATER	CHILLER ROOM	BASE MOUNTED, END SUCTION	30% PROPYLENE GLYCOL	5.25	320	80	9.12	11.8	70.9	72.4	175	44	NEMA PREMIUM, VFD READY	TEFC	10	1800	208/3/60	VARIABLE	34x14	328	BELL & GOSSETT	e-1510 2.5AC
CHWP-4	CHILLED WATER	CHILLER ROOM	BASE MOUNTED, END SUCTION	30% PROPYLENE GLYCOL	5.25	320	80	9.12	11.8	70.9	72.4	175	44	NEMA PREMIUM, VFD READY	TEFC	10	1800	208/3/60	VARIABLE	34x14	328	BELL & GOSSETT	e-1510 2.5AC

NOTES:  
1. PROVIDE OPERATIONS AND MAINTENANCE MANUALS.  
2. PROVIDE VARIABLE FREQUENCY DRIVE WITH HOA CONTROL.  
3. PROVIDE INTERNALLY SELF-FLUSHING MECHANICAL SEALS.

CONDENSATE DRAIN PIPE SIZING SCHEDULE	
SIZE (IN)	MAXIMUM CONNECTED COOLING CAPACITY (TONS)
3/4	20
1	40
1 1/4	90
1 1/2	125
2	250

NOTES:  
1. SIZE CONDENSATE DRAIN PIPING PER THIS SCHEDULE WHERE NOT OTHERWISE INDICATED IN THE CONTRACT DOCUMENTS.

COOLING COIL SCHEDULE																
TAG	SERVICE	REFRIGERANT	TOTAL COOLING CAPACITY (BTU/H)	SENSIBLE COOLING CAPACITY (BTU/H)	SUPPLY AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	PRESS. DROP (IN WC)	EAT (°F DB)	EAT (°F WB)	LAT (°F DB)	LAT (°F WB)	MAX. FACE VELOCITY (FPM)	MIN. FACE AREA (SF)	ROWS	OVERALL DIMENSIONS (WxH)(IN)	BASIS OF DESIGN
CC-3	AHU-3	R-410A	52,380	36,660	2000	1000	0.5	79.0	67.0	55.0	54.0	400	5.0	4-8	44x35.25	TRANE CSAA SIZE 6, TYPE UF COIL
CC-4	AHU-4	R-410A	115,605	80,900	7000	1360	0.5	75.0	65.0	55.0	54.0	400	17.5	4-8	80x52.75	TRANE CSAA SIZE 21, TYPE UF COIL
CC-5	AHU-5	R-410A	115,605	80,900	7000	1360	0.5	75.0	65.0	55.0	54.0	400	17.5	4-8	80x52.75	TRANE CSAA SIZE 21, TYPE UF COIL
CC-7	AHU-7	R-410A	52,380	36,660	2000	1000	0.5	79.0	67.0	55.0	54.0	400	5.0	4-8	44x35.25	TRANE CSAA SIZE 6, TYPE UF COIL
CC-8	AHU-8	R-410A	52,380	36,660	2000	1000	0.5	79.0	67.0	55.0	54.0	400	5.0	4-8	44x35.25	TRANE CSAA SIZE 6, TYPE UF COIL

NOTES:  
1. THE COILS SHALL BE FACTORY INSTALLED WITHIN A DOUBLE-WALLED, INSULATED HOUSING COMPLETE WITH ACCESS DOORS AND DRAIN PAN.  
2. PROVIDE LINEAR EXPANSION VALVE KITS FOR EACH COIL. THE EXPANSION VALVES SHALL BE A PRODUCT OF THE VRF SYSTEM MANUFACTURER (REFER TO THE SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE).

AIR COOLED WATER CHILLER SCHEDULE		
CHILLER TAG	CH-1 AND CH-2	
LOCATION	OUTDOORS	
DIMENSIONS	LENGTH x WIDTH x HEIGHT (IN) HEIGHT (IN) OPERATING WEIGHT (LBS)	251 x 89 x 94 94 10691
REFRIGERATION CAPACITY (EACH CHILLER)(TONS)	116.81	
COMPRESSORS (EACH MODULE)	QUANTITY CAPACITY CONTROL RLA EACH TEMP. ENT F. TEMP. LVG F. GPM MAX. P.D.-FT. FOULING FACTOR WORKING FLUID	2 VARIABLE 98 54 44 320 11.6 0.0001 30% GLYCOL
EVAPORATOR (TOTAL)	AMBIENT AIR TEMP. °F	95
CONDENSER (EACH MODULE)	QUANTITY FLA EACH FAN TYPE	10 2.5 VARIABLE SPEED
ELECTRICAL	VOLTS/PH/Hz MCA (A) CIRCUIT #1 MOP (A) CIRCUIT #1 MCA (A) CIRCUIT #2 MOP (A) CIRCUIT #2	208/3/60 310.72 500 298.56 500
REFRIGERANT DATA	REFRIGERANT REFRIGERANT CHARGE CKT #1 (LB) REFRIGERANT CHARGE CKT #2 (LB) REFRIGERANT SAFETY CLASS	R-513A 86.6 84.9 A1
A-WEIGHTED SOUND POWER (DBA AT 30 FEET FULL LOAD)	100	
TOTAL SYSTEM EER, FULL LOAD, AHRI (BTU/W)	9.931	
TOTAL SYSTEM EER, IPLV (BTU/W)	16.10	

REMARKS:  
1. PROVIDE OPERATIONS AND MAINTENANCE MANUALS.  
2. PROVIDE MANUFACTURER'S STANDARD FREEZE PROTECTION PACKAGE AND SEPARATE 115V POWER SOURCE  
3. PROVIDE CONVENIENCE OUTLET WITH SEPARATE 115V POWER SOURCE.  
4. THE POWER CONNECTIONS FOR EACH CIRCUIT SHALL BE PROVIDED IN TWO SEPARATE ENCLOSURES.  
5. REFER TO THE CHILLER ACOUSTIC ACCESSORIES SCHEDULE BELOW FOR SOUND ATTENUATION TO BE PROVIDED UNDER THIS CONTRACT.  
6. THE CHILLERS HAVE BEEN PRE-ORDERED (TRANE RTAF130EUAH) BY THE OWNER. INSTALL THE CHILLERS UNDER THIS CONTRACT.

WATER PIPE SIZING SCHEDULE		
SIZE (IN)	MATERIAL	MAXIMUM FLOW (GPM)
3/4	TYPE L COPPER	3.5
1	TYPE L COPPER	7.4
1 1/4	TYPE L COPPER	13.2
1 1/2	TYPE L COPPER	21
2	TYPE L COPPER	44
2 1/2	TYPE L COPPER	79
3	SCHEDULE 40 STEEL	131
4	SCHEDULE 40 STEEL	270
6	SCHEDULE 40 STEEL	360
8	SCHEDULE 40 STEEL	620

NOTES:  
1. SIZE HOT AND CHILLED WATER PIPING PER THIS SCHEDULE WHERE NOT OTHERWISE INDICATED IN THE CONTRACT DOCUMENTS.

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE																
UNIT #	LOCATION	TOTAL COOLING CAPACITY (MBH)	EER	IEER	REFRIGERANT	CONDENSER EA DB °F (COOLING/HEATING)	COMPRESSOR TYPE	ELECTRICAL				UNIT WEIGHT (LBS)	BASIS OF DESIGN			
								VOLTS	PHASE	Hz	MOCp (A)		MCA (A)	MANUFACTURER	MODEL #	
AC-3	GRADE	72,000	11.9	27.2	R410A	95/0	SCROLL	208	3	60	40	24.0	470	MITSUBISHI	PUHY-P72TNU-A	
AC-4	GRADE	240,000	12.2	23.2	R410A	95/0	SCROLL	208	3	60	80	49.0	649	MITSUBISHI	PUHY-P144TNU-A	
AC-5	GRADE	240,000	12.2	23.2	R410A	95/0	SCROLL	208	3	60	80	49.0	649	MITSUBISHI	PUHY-P144TNU-A	
AC-7	GRADE	72,000	11.9	27.2	R410A	95/0	SCROLL	208	3	60	40	24.0	470	MITSUBISHI	PUHY-P72TNU-A	
AC-8	GRADE	72,000	11.9	27.2	R410A	95/0	SCROLL	208	3	60	40	24.0	470	MITSUBISHI	PUHY-P72TNU-A	

NOTES:  
1. PROVIDE DISCONNECT SWITCH.  
2. PROVIDE LINEAR EXPANSION VALVE KIT FOR CONNECTION TO THE COOLING COILS (PAC-LV96AC-1/PAC-LV120AC-1 OR EQUAL).  
3. PROVIDE AHU CONTROLLER (PAC0AH001-1 OR EQUAL).  
4. PROVIDE TWINNING KIT WHERE REQUIRED BY THE MANUFACTURER.  
5. PROVIDE FILTER DRIER KIT (PAC-SFRFC5 OR EQUAL).

CHILLER ACOUSTIC ACCESSORIES					
CHILLER TAG #	COMPRESSOR ACOUSTIC BLANKETS		CHILLER NOISE REDUCTION SYSTEM		
	QUANTITY	BASIS OF DESIGN	BASIS OF DESIGN	DIMENSIONS (LxWxH)(IN)	WEIGHT (LBS)
CH-1	2	BRD HUSH COVER	VERTICAL BY-PASS	242x98	300
CH-2	2	BRD HUSH COVER	NOT APPLICABLE		

NOTES:  
1. THE CHILLERS HAVE BEEN PRE-ORDERED WITHOUT THE ACOUSTIC ACCESSORIES SPECIFIED IN THIS SCHEDULE. COORDINATE WITH THE CHILLER MANUFACTURER AND PROVIDE THE ITEMS LISTED IN THIS SCHEDULE UNDER THIS CONTRACT.

GLYCOL MAKEUP UNIT													
UNIT #	LOCATION	FLOW RATE (GPM)	MAX. PRESS. (PSIG)	TANK SIZE (GAL)	ELECTRICAL				OVERALL DIMENSIONS (LxWxH, IN)	UNIT WEIGHT (LBS)	BASIS OF DESIGN		
					VOLTS	PHASE	Hz	MOP (A)			MCA (A)	MANUFACTURER	MODEL #
MU-1	CHILLER RM	1.4	85	100	115	1	60	15	0.9	33x33x60	900	AXIOM INDUSTRIES	SF-100-PRV-HP-L

NOTES:  
1. PROVIDE A PACKAGED MAKE-UP UNIT WHICH SHALL BE CAPABLE OF MAINTAINING THE SYSTEM FILL PRESSURE AT 30 PSIG. PROVIDE A POLYETHYLENE TANK WITH REMOVABLE LID, STRAINER, ISOLATION VALVES, PUMP, CHECK/BALANCING VALVE, EXPANSION TANK, DISCHARGE PRESSURE GAUGE, STEEL PIPING, LOW LEVEL CUT-OUT, AND CONTROL ARM PANEL WITH INDICATOR LIGHTS IN A NEMA 4 ENCLOSURE.  
2. PROVIDE WITH DUAL PRVS AND CONTROLS CAPABLE OF SUPPLYING TWO SEPARATE SYSTEMS.

CHEMICAL SHOT FEEDER SCHEDULE								
UNIT #	SERVICE	LOCATION	TYPE	SIZE (GAL)	MAX. PRESS. (PSIG)	WEIGHT (LBS)	BASIS OF DESIGN	
							MANUFACTURER	MODEL #
CF-1	CHW	OUTDOORS	VERTICAL BY-PASS	5	300	38	NEPTUNE	DBF-5HP
CF-2	CHW	CHILLER RM	VERTICAL BY-PASS	5	300	38	NEPTUNE	DBF-5HP

EXPANSION TANK SCHEDULE												
UNIT #	LOCATION	SYSTEM	APPROX. SYSTEM VOLUME (GAL)	SYSTEM TEMP. RANGE		INITIAL TANK PRESS (PSIG)	MIN. VOLUME (GAL)	MIN. ACCEPT. ANCE VOLUME (GAL)	PIPE SIZE TO TANK (IN)	UNIT WEIGHT WHEN FULL (LBS)	BASIS OF DESIGN	
				MIN. (°F)	MAX. (°F)						MANUFACTURER	MODEL #
ET-1	OUTDOORS	CHW	2000	40	100	12	50	25	1	700	BELL & GOSSETT	200-L
ET-2	CHILLER RM	CHW	2000	40	100	12	50	25	1	700	BELL & GOSSETT	200-L

NOTES:  
1. PROVIDE VERTICAL ASME BLADDER EXPANSION TANK.

AIR SEPARATOR SCHEDULE									
UNIT #	SERVICE	LOCATION	TYPE	AIR SEPARATOR			OPERATING WEIGHT (LBS)	BASIS OF DESIGN	
				SIZE (IN)	FLOW (GPM)	PRESS. DROP (FT H2O)		MANUFACTURER	MODEL #
AS-1	CHW	BASEMENT	COALESCING AIR & DIRT	6	320	0.81	366	BELL & GOSSETT	CRSN-6F
AS-2	CHW	BASEMENT	COALESCING AIR & DIRT	6	320	0.81	366	BELL & GOSSETT	CRSN-6F

WATER FILTER SCHEDULE									
UNIT #	SERVICE	LOCATION	TYPE	SIZE (IN)	FLOW (GPM)	FILTER MEDIA (MICRON)	BASIS OF DESIGN		
							MANUFACTURER	MODEL #	
WF-1	CHW	OUTDOORS	SIDE STREAM	1	10	5	AXIOM INDUSTRIES	SFP-10	
WF-2	CHW	CHILLER RM	SIDE STREAM	1	10	5	AXIOM INDUSTRIES	SFP-10	

WATER FILTER SCHEDULE NOTES:  
1. PROVIDE WITH 304SS FILTER HOUSING WITH BRASS HEAD, SIGHT GLASS, BALL VALVES, BALANCING VALVE, BRASS DRAIN VALVE, AND BRASS NIPPLES. FILTER MEDIA SHALL BE COTTON WOUND WITH TIN CORE (25 MICRON).  
2. REPLACE THE FILTER MEDIA WITH A NEW 25 MICRON CARTRIDGE AFTER SYSTEM START-UP AND BALANCING. PROVIDE ATTC STOCK OF TWO 25 MICRON AND TWO 5 MICRON FILTERS.

VAV BOX SCHEDULE							
TAG	SERVICE	INLET SIZE	CFM		MAX NC LEVEL	DESIGN BASIS	REMARKS
			MAX	MIN			
V-01	CLASSROOM	12	1520	460	20	VCCF	SEE NOTES
V-02	CLASSROOM	10	1220	365	20	VCCF	SEE NOTES
V-03	CLASSROOM	10	1220	365	20	VCCF	SEE NOTES
V-04	CLASSROOM	10	1220	365	20	VCCF	SEE NOTES
V-05	CLASSROOM	10	1200	360	20	VCCF	SEE NOTES
V-06	CLASSROOM	10	1200	360	20	VCCF	SEE NOTES
V-07	CLASSROOM	10	1200	360	20	VCCF	SEE NOTES
V-08	CLASSROOM	10	1040	315	20	VCCF	SEE NOTES
V-09	CLASSROOM	10	1200	360	20	VCCF	SEE NOTES
V-10	CLASSROOM	10	1340	400	20	VCCF	SEE NOTES
V-11	CLASSROOM	14	2000	600	20	VCCF	SEE NOTES
V-12	CLASSROOM	10	950	285	20	VCCF	SEE NOTES
V-13	CLASSROOM	10	950	285	20	VCCF	SEE NOTES
V-14	CLASSROOM	12	1500	450	20	VCCF	SEE NOTES
V-15	CLASSROOM	10	1140	340	20	VCCF	SEE NOTES
V-16	CLASSROOM	8	400	120	20	VCCF	SEE NOTES
V-21	KITCHEN	14	1990	600	20	VCCF	SEE NOTES
V-21D	FAC ROOM	10	1230	365	20	VCCF	SEE NOTES

NOTES:  
1. PROVIDE CONTROLS CABINET WITH CONTROL TRANSFORMER AND 120V TO CONTROL VOLTAGE.  
2. PROVIDE REMOVABLE FLOW SENSOR.  
3. PROVIDE HANGER BRACKET SUPPORTS. SIDE ACCESS DOOR. FIBER-FREE LINER.

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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
Checked by: PV  
Project No.: 42054  
Scale: NTS  
Date: 09-14-23

MECHANICAL ENGINEER: GREENMAN PEDERSEN, INC. 2 EXECUTIVE DR. SUITE 200, SUDBURY, NY 10961  
STRUCTURAL ENGINEER: GREENMAN PEDERSEN, INC. 2 EXECUTIVE DR. SUITE 200, SUDBURY, NY 10961

UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
145 POND DR. TULSA, OK 74104  
COUNTY OF ROCKLAND

MSA  
MICHAEL SHILALE ARCHITECTS, LLP  
140 Park Avenue New York, NY 10065 Tel 845-708-9200  
www.shilale.com

MECHANICAL SCHEDULES - 1  
Drawing No.: WGES-M-002

**UNIT VENTILATOR SCHEDULE**

UNIT TAG	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	BASE BID: REPLACE THE COILS FOR THE EXISTING UNIT VENTILATOR IN NORTH WING AS INDICATED BELOW. EXISTING UNIT VENTILATOR TO REMAIN. ALL OTHER UNIT VENTILATORS TO BE REPLACED.			ALTERNATE NO. 200 REPLACE UNIT VENTILATORS IN NORTH WING
				COOLING	HEATING		EADB (°F)	EAWB (°F)	LADB (°F)	LAWB (°F)	EWT	LWT	WATER FLOW (GPM)	WATER PRESSURE DROP (FT H <sub>2</sub> O)	MIN TOTAL CAPACITY (BTU/H)	EADB (°F)	LADB (°F)	EWT	LWT	WATER FLOW (GPM)	WATER PRESSURE DROP (FT H <sub>2</sub> O)	REQUIRED TOTAL CAPACITY (BTU/H)	MERV	MCA	MAX FUSE SIZE	V/PH/Hz					HANDING OF EX. COIL	HANDING OF NEW COIL	EX. UNIT VENTILATOR MODEL NUMBER (TRANE)	
UV-101	RM 101	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-102	RM 102	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-103	RM 103	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-104	RM 104	HORIZONTAL	1500	460	460	1500	80.6	69.3	55	54	44	54	8.92	7.0	44,600	52.7	90	180	160	6.05	4.0	60,500	13	12	15	115/160	500	106.25x39	21.25	TRANE HUVC150	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-105	RM 105	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-106	RM 106	VERTICAL	1250	400	400	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	51.8	90	180	160	5.15	4.0	51,500	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-107	RM 107	HORIZONTAL	1500	450	450	1500	80.6	69.2	55	54	44	54	8.92	7.0	44,600	53.1	90	180	160	5.98	4.0	59,800	13	12	15	115/160	500	106.25x39	21.25	TRANE HUVC150	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-108	RM 108	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-109	RM 109	VERTICAL	1250	405	405	1500	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-110	RM 110	HORIZONTAL	1500	415	415	1250	80.4	69.1	55	54	44	54	8.92	7.0	44,600	54.6	90	180	160	5.74	4.0	57,400	13	12	15	115/160	500	106.25x39	21.25	TRANE HUVC150	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-111	RM 111	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-112	RM 112	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-113	RM 113	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-114A	RM 114	VERTICAL	1250	365	365	1250	80.5	69.2	55	54	44	54	7.42	7.0	37,100	53.6	90	180	160	4.91	4.0	49,100	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-114B	RM 114	VERTICAL	1250	365	365	1250	80.5	69.2	55	54	44	54	7.42	7.0	37,100	53.6	90	180	160	4.91	4.0	49,100	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-117A	RM 117	HORIZONTAL	1250	280	280	1250	79.9	68.9	55	54	44	54	7.42	7.0	37,100	57.9	90	180	160	4.34	4.0	43,400	13	12	15	115/160	435	94.25x38	21.25	TRANE HUVC125	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-117B	RM 117	HORIZONTAL	1250	280	280	1250	79.9	68.9	55	54	44	54	7.42	7.0	37,100	57.9	90	180	160	4.34	4.0	43,400	13	12	15	115/160	435	94.25x38	21.25	TRANE HUVC125	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-118	RM 118	HORIZONTAL	750	90	90	750	79.0	68.5	55	54	44	54	4.46	7.0	22,300	64.4	90	180	160	2.07	4.0	20,700	13	12	15	115/160	340	70.25x36	21.25	TRANE HUVC075	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-119	RM 119	HORIZONTAL	750	195	195	750	80.2	69.1	55	54	44	54	4.46	7.0	22,300	55.6	90	180	160	2.78	4.0	27,800	13	12	15	115/160	340	70.25x36	21.25	TRANE HUVC075	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-LL19	RM LL19	VERTICAL	1500	450	450	1250	80.6	69.2	55	54	44	54	8.92	7.0	44,600	53.1	90	180	160	5.98	4.0	59,800	13	8.75	15	115/160	470	105x30	21.25	TRANE VUVE150	REPLACE UNIT VENTILATOR	REPLACE UNIT VENTILATOR	NOT APPLICABLE	NOT APPLICABLE
UV-LL21A	RM LL21	VERTICAL	1500	325	325	1500	79.8	68.9	55	54	44	54	8.92	7.0	44,600	58.4	90	180	160	5.13	4.0	51,300	13	8.75	15	115/160	470	105x30	21.25	TRANE VUVE150	REPLACE UNIT VENTILATOR	REPLACE UNIT VENTILATOR	NOT APPLICABLE	NOT APPLICABLE
UV-LL21B	RM LL21	VERTICAL	1500	325	325	1500	79.8	68.9	55	54	44	54	8.92	7.0	44,600	58.4	90	180	160	5.13	5.0	51,300	14	8.75	15	115/160	470	105x30	21.25	TRANE VUVE150	REPLACE UNIT VENTILATOR	REPLACE UNIT VENTILATOR	NOT APPLICABLE	NOT APPLICABLE
UV-200	RM 200	VERTICAL	750	75	75	750	78.9	68.4	55	54	44	54	4.46	7.0	22,300	65.7	90	180	160	1.97	6.0	19,700	15	4.38	15	115/160	320	69x30	21.25	TRANE VUVE075	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-201	RM 201	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-202	RM 202	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-203	RM 203	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-204	RM 204	HORIZONTAL	1500	460	460	1500	80.6	69.3	55	54	44	54	8.92	7.0	44,600	52.7	90	180	160	6.05	4.0	60,500	13	12	15	115/160	500	106.25x39	21.25	TRANE HUVC150	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-205	RM 205	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-206	RM 206	VERTICAL	1250	400	400	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	51.8	90	180	160	5.15	4.0	51,500	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-207	RM 207	HORIZONTAL	1500	450	450	1500	80.6	69.2	55	54	44	54	8.92	7.0	44,600	53.1	90	180	160	5.98	4.0	59,800	13	12	15	115/160	500	106.25x39	21.25	TRANE HUVC150	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-208	RM 208	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-209	RM 209	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-210	RM 210	HORIZONTAL	1500	450	450	1500	80.6	69.2	55	54	44	54	8.92	7.0	44,600	53.1	90	180	160	5.98	4.0	59,800	13	12	15	115/160	500	106.25x39	21.25	TRANE HUVC150	VIF	VIF	HUV_150	REPLACE UNIT VENTILATOR
UV-211	RM 211	VERTICAL	1250	405	405	1250	80.8	69.3	55	54	44	54	7.42	7.0	37,100	51.6	90	180	160	5.19	4.0	51,900	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-212	RM 212	VERTICAL	1250	390	390	1250	80.7	69.3	55	54	44	54	7.42	7.0	37,100	52.3	90	180	160	5.08	4.0	50,800	13	8.75	15	115/160	450	93x30	21.25	TRANE VUVE125	RH COOLING/LH HEATING	LH COOLING/RH HEATING	VUVB12510G0DAD0000011CG100001510	REPLACE UNIT VENTILATOR
UV-213	RM 213	VERTICAL																																





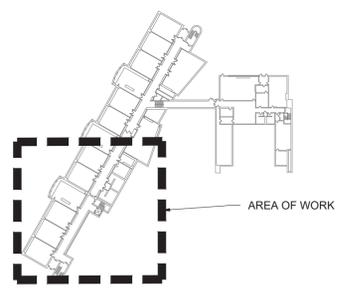


MATCHLINE SEE DRAWING WGES-M-062

**KEYED NOTES:**

- ① BASE BID: UNIT VENTILATOR TO REMAIN. REMOVE THE FOUR-PIPE COIL ONLY.  
ALT NO. 200: DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB125). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ② BASE BID: EXISTING UNIT VENTILATOR TO REMAIN.  
ALT NO. 200: DEMOLISH HORIZONTAL UNIT VENTILATOR ABOVE CEILING (TRANE MODEL HUVB150). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ③ FINNED TUBE RADIATOR TO REMAIN
- ④ DEMOLISH 1/2" AND 7/8" REFRIGERANT PIPING.
- ⑤ 1 1/4" CHWS & R UP THROUGH FLOOR TO UNIT VENTILATOR ON SECOND FLOOR.
- ⑥ 2" CHWS & R DN TO CRAWLSPACE.
- ⑦ PERFORM A HYDROSTATIC TEST ON THE EXISTING CHILLED WATER PIPING AT THE CRAWLSPACE AND SUBMIT FOR APPROVAL PRIOR TO FABRICATION OR INSTALLATION OF THE CHILLED WATER PIPING IN THIS WING. UPON COMPLETION OF THE WORK, PERFORM TESTING AND BALANCING OF THE COMPLETED SYSTEM AS PER THE SPECIFICATIONS.
- ⑧ EXISTING RECESSED CABINET HEATER TO REMAIN.

**1 LOWER LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"



**2 LOWER LEVEL KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

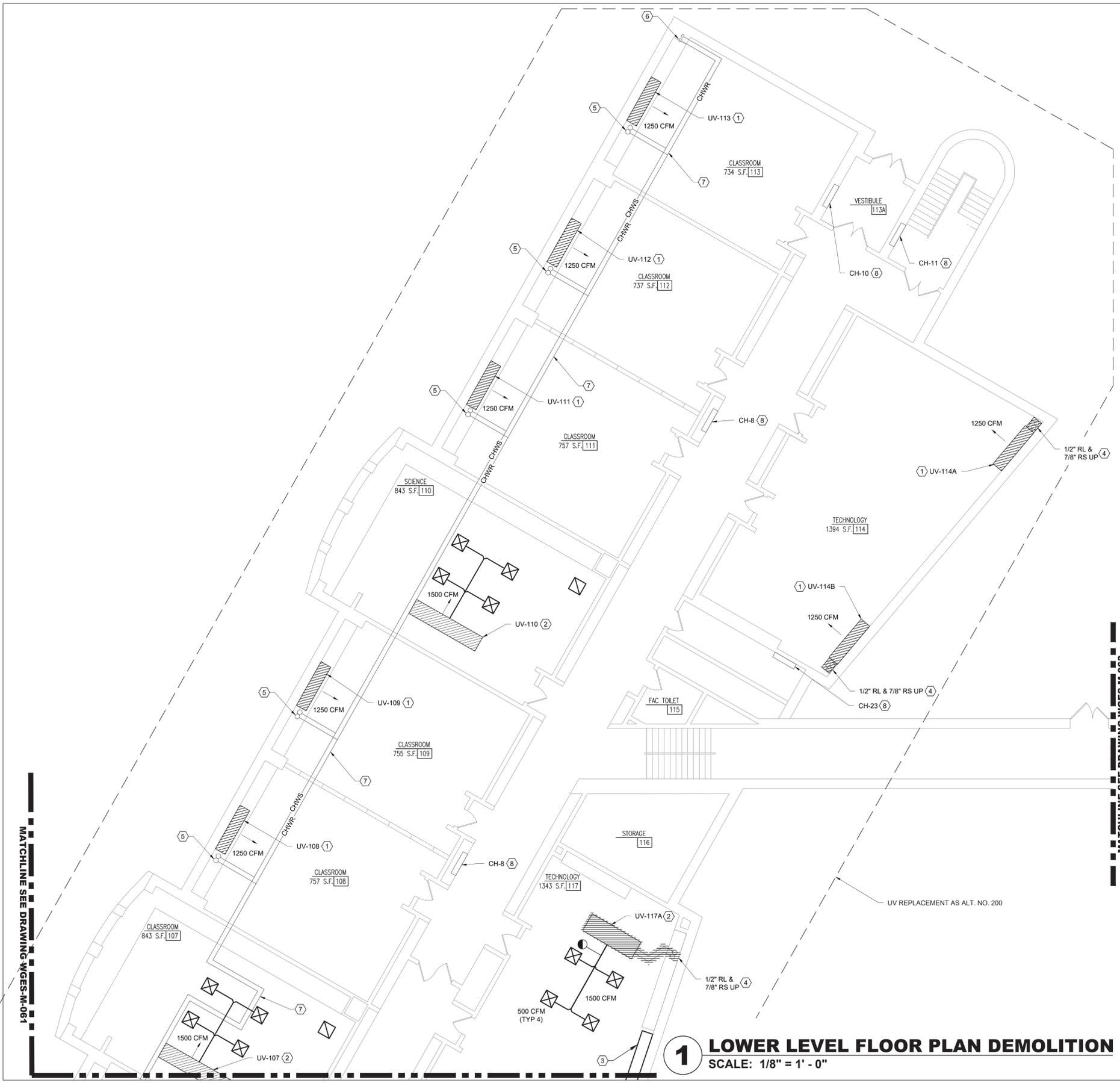
Drawn by	MEP	PV	42054
Checked by			
Project No.			
Scale	AS NOTED		
Date	09-14-23		

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 SUDBURY, NY 10861	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 SUDBURY, NY 10861
Mechanical Structural Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 PINE ST. TOWN, NY 10864  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10022 Tel 845-708-9200  
www.msaarch.com

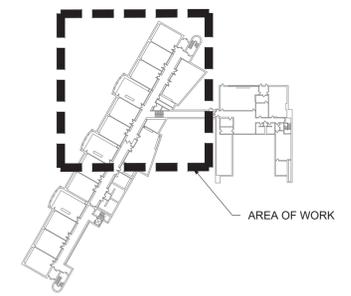
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL LOWER LEVEL DEMOLITION - 1**  
Drawing No.  
**WGES-M-061**



**1 LOWER LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"

**KEYED NOTES:**

- ① BASE BID: UNIT VENTILATOR TO REMAIN. REMOVE THE FOUR-PIPE COIL ONLY.  
ALT NO. 200: DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB125). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ② BASE BID: EXISTING UNIT VENTILATOR TO REMAIN.  
ALT NO. 200: DEMOLISH HORIZONTAL UNIT VENTILATOR ABOVE CEILING (TRANE MODEL HUVB150). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ③ FINNED TUBE RADIATOR TO REMAIN.
- ④ DEMOLISH 1/2" AND 7/8" REFRIGERANT PIPING.
- ⑤ 1 1/4" CHWS & R UP THROUGH FLOOR TO UNIT VENTILATOR ON SECOND FLOOR.
- ⑥ 2" CHWS & R DN TO CRAWLSPACE.
- ⑦ PERFORM A HYDROSTATIC TEST ON THE EXISTING CHILLED WATER PIPING AT THE CRAWLSPACE AND SUBMIT FOR APPROVAL PRIOR TO FABRICATION OR INSTALLATION OF THE CHILLED WATER PIPING IN THIS WING. UPON COMPLETION OF THE WORK, PERFORM TESTING AND BALANCING OF THE COMPLETED SYSTEM AS PER THE SPECIFICATIONS.
- ⑧ EXISTING RECESSED CABINET HEATER TO REMAIN.



**2 LOWER LEVEL KEY PLAN**  
SCALE: NONE

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

REC. EXP. DATE: 04-30-24

Drawn by	MEP	PV	42054
Checked by			
Project No.			
Scale			AS NOTED
Date			09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 STURZENEGGER, NY 10981	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 STURZENEGGER, NY 10981
Mechanical Structural Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 PINE ST  
TIBOLA, NY 10984  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New City, NY 10956 Tel 845-708-9200  
www.msaarch.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL LOWER LEVEL DEMOLITION - 2**  
Drawing No.  
**WGES-M-062**

MATCHLINE SEE DRAWING WGES-M-061

MATCHLINE SEE DRAWING WGES-M-063







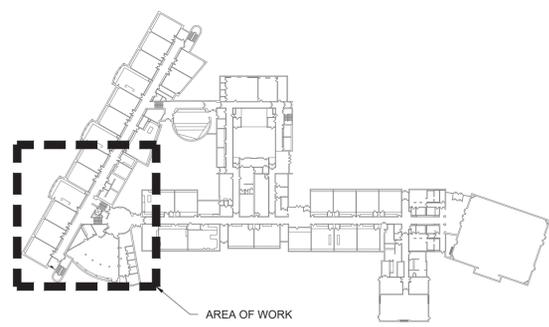
MATCHLINE SEE DRAWING WGES-M-065

**KEYED NOTES:**

- ① BASE BID: UNIT VENTILATOR TO REMAIN. REMOVE THE FOUR-PIPE COIL ONLY.  
ALT NO. 200: DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB125). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ② BASE BID: EXISTING UNIT VENTILATOR TO REMAIN.  
ALT NO. 200: DEMOLISH HORIZONTAL UNIT VENTILATOR ABOVE CEILING (TRANE MODEL HUVB150). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ③ DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB075). DEMOLISH HW PIPING BACK TO THE MAIN. TEMPORARILY CAP THE PIPING AND OA INTAKE.
- ④ DEMOLISH TWO SETS OF 1/2" AND 7/8" REFRIGERANT PIPING.
- ⑤ RECESSED CABINET HEATER TO REMAIN.
- ⑥ FINNED TUBE RADIATOR TO REMAIN.

MATCHLINE SEE DRAWING WGES-M-067

**1 MAIN LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	AS NOTED
Date	09-14-23

**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
STURBRIDGE, NY 10981

Mechanical Electrical Engineer:  
Structural Engineer:

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 PINE ST. TULSA, OK 74104  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10056 Tel 845-708-0200  
www.msaarch.com

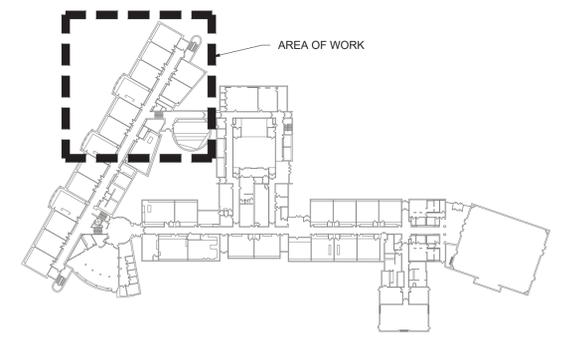
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title: **MECHANICAL MAIN LEVEL DEMOLITION - 1**  
Drawing No.: **WGES-M-064**



**1 MAIN LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/16" = 1' - 0"

**KEYED NOTES:**

- ① BASE BID: UNIT VENTILATOR TO REMAIN. REMOVE THE FOUR-PIPE COIL ONLY.
- ALT NO. 200: DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB125). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ② BASE BID: EXISTING UNIT VENTILATOR TO REMAIN.
- ALT NO. 200: DEMOLISH HORIZONTAL UNIT VENTILATOR ABOVE CEILING (TRANE MODEL HUVB150). DISCONNECT AND TEMPORARILY CAP HOT WATER PIPING. TEMPORARILY COVER OA INTAKE.
- ③ DEMOLISH CABINET HEATER. DISCONNECT HW PIPING. TEMPORARILY CAP THE PIPING AND OA INTAKE.
- ④ DEMOLISH 2 SETS OF 1/2" AND 7/8" REFRIGERANT PIPING.
- ⑤ RECESSED CABINET HEATER TO REMAIN.
- ⑥ FINNED TUBE RADIATOR TO REMAIN.



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
 Checked by: PV  
 Project No.: 42054  
 Scale: AS NOTED  
 Date: 09-14-23

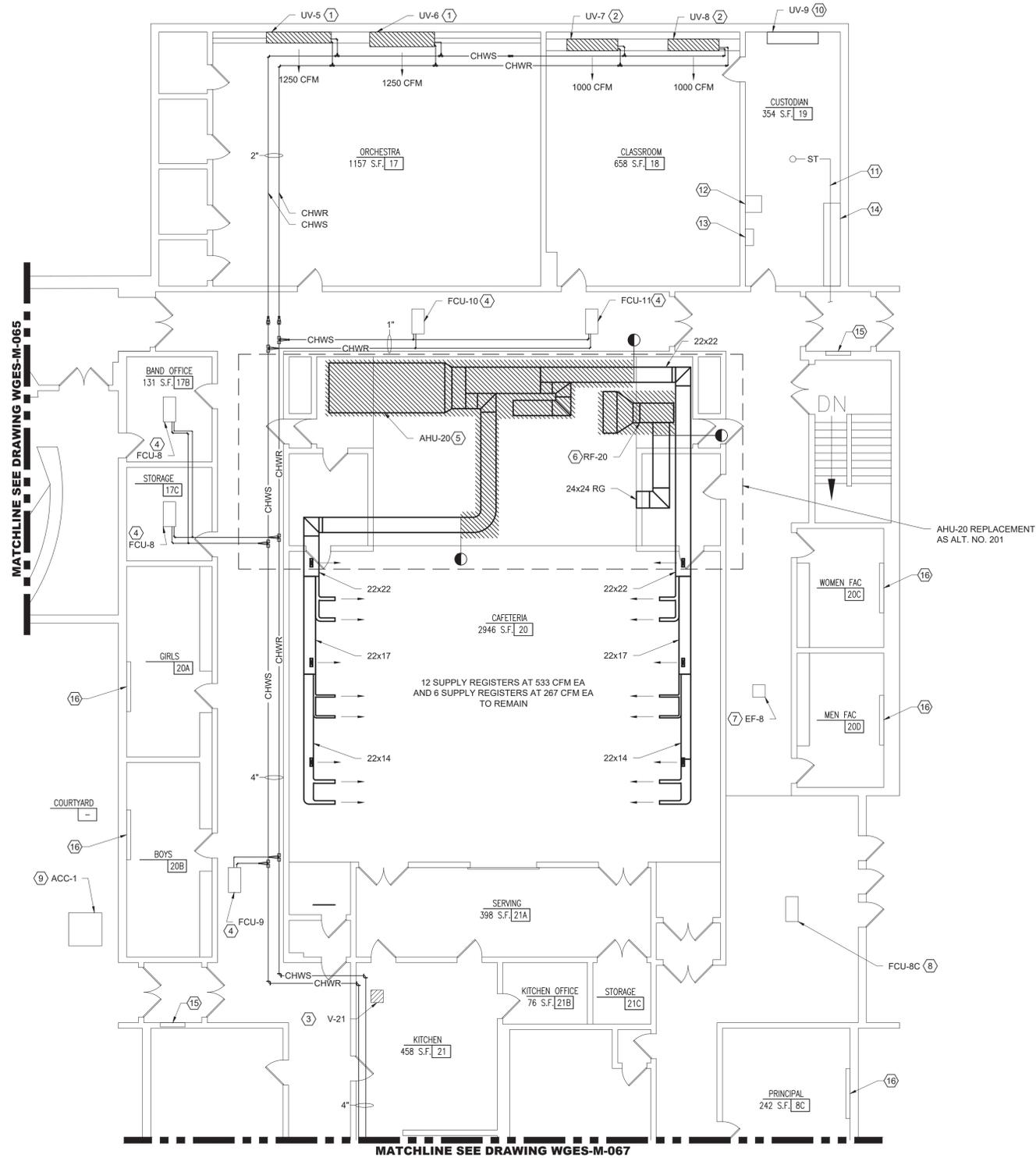
**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10961  
 Mechanical/Electrical Engineer

**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10961  
 Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
 SED# 50-02-01-06-0-030-016  
 145 POND DR  
 TIRRELL, NY 10984  
 COUNTY OF ROCKLAND

**MSA**  
**MICHAEL SHILALE ARCHITECTS, L.L.P.**  
 140 Park Avenue New City, NY 10956 Tel 845-708-0200  
 www.msaarch.com

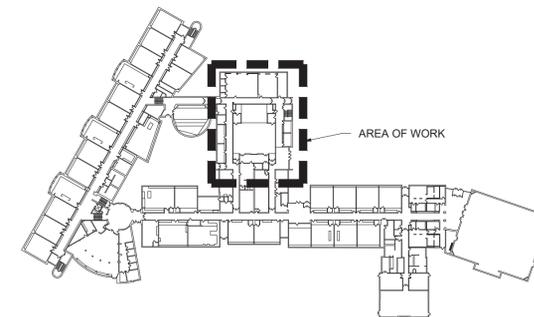
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
 Drawing Title: **MECHANICAL MAIN LEVEL DEMOLITION - 2**  
 Drawing No.: **WGES-M-065**



**1 MAIN LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"

**KEYED NOTES:**

- ① DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB125).
- ② DEMOLISH VERTICAL UNIT VENTILATOR (TRANE MODEL VUVB100).
- ③ DEMOLISH VAV BOX ABOVE THE CEILING (TRANE MODEL VCCD).
- ④ HORIZONTAL FAN COIL UNIT ABOVE THE CEILING TO REMAIN.
- ⑤ BASE BID: EXISTING CAFETERIA AIR HANDLING UNIT AHU-20 TO REMAIN.  
ALT. NO. 201: CAFETERIA AIR HANDLING UNIT AT CEILING. DEMOLISH CONTROLS ONLY UNDER BASE BID, AND DEMOLISH ENTIRE UNIT UNDER ALTERNATE NO. 201.
- ⑥ BASE BID: EXISTING RETURN FAN TO REMAIN.  
ALT. NO. 201: AUDITORIUM RETURN FAN. DEMOLISH CONTROLS ONLY UNDER BASE BID, AND DEMOLISH ENTIRE UNIT UNDER ALTERNATE NO. 201.
- ⑦ TOILET EXHAUST FAN ABOVE THE CEILING TO REMAIN.
- ⑧ FAN COIL UNIT ABOVE THE CEILING TO REMAIN.
- ⑨ SPLIT SYSTEM AC UNIT ACC-1 INTERLOCKED WITH THE BAND ROOM AHU-1 TO REMAIN (INTERNATIONAL COMFORT MODEL CAS120HDA0A00AA, 10 TONS COOLING).
- ⑩ VERTICAL UNIT VENTILATOR TO REMAIN.
- ⑪ 4" STORM PIPE AT CEILING TO REMAIN.
- ⑫ DEMOLISH PRIMARY OPERATOR'S TERMINAL FOR THE BMS.
- ⑬ FUEL OIL TANK GAUGING AND LEAK DETECTION SYSTEM PANEL TO REMAIN (ONMTEC PROTEUS).
- ⑭ ELECTRICAL SWITCHGEAR TO REMAIN.
- ⑮ RECESSED CONVECTOR TO REMAIN.
- ⑯ FINNED TUBE RADIATOR TO REMAIN.



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

Drawn by	MEP	PV	42054
Checked by			
Project No.	42054		
Scale	AS NOTED		
Date	09-14-23		

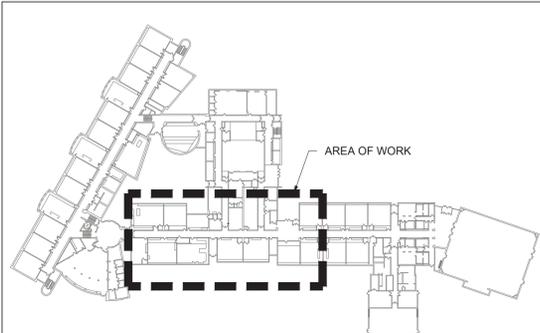
<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861
Mechanical Electrical Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
140 PARK AVENUE NEW CITY, NY 10858 TEL 845-708-5000  
www.univent.com  
COUNTY OF ROCKLAND  
THERESA, NY 10984



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.

Drawing Title  
**MECHANICAL MAIN LEVEL DEMOLITION - 3**  
Drawing No.  
**WGES-M-066**



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE

**KEYED NOTES:**

- ① REFURBISH AIR HANDLING UNIT, AHU-1, ABOVE THE CEILING IN THE CORRIDOR (ALT. NO. 202).
- ② REFURBISH EXHAUST FAN, EF-1, ABOVE THE CEILING IN THE CORRIDOR (ALT. NO. 202).
- ③ DEMOLISH THE VAV BOX ABOVE THE CEILING (TRANE MODEL VCCD).
- ④ FAN COIL UNIT ABOVE THE CEILING TO REMAIN.
- ⑤ AIR COOLED CONDENSING UNIT TO REMAIN.
- ⑥ BOILER TO REMAIN (WEIL MCLAIN MODEL 1894).
- ⑦ HOT WATER PUMP TO REMAIN.
- ⑧ 4" 3-WAY CONTROL VALVE WITH PNEUMATIC ACTUATOR TO REMAIN.
- ⑨ EXISTING FINNED TUBE HEATING ELEMENT RECESSED WITHIN WOODEN CASEWORK TO REMAIN.
- ⑩ EXISTING FINNED TUBE RADIATOR TO REMAIN.

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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
 Checked by: PV  
 Project No.: 42054  
 Scale: AS NOTED  
 Date: 09-14-23

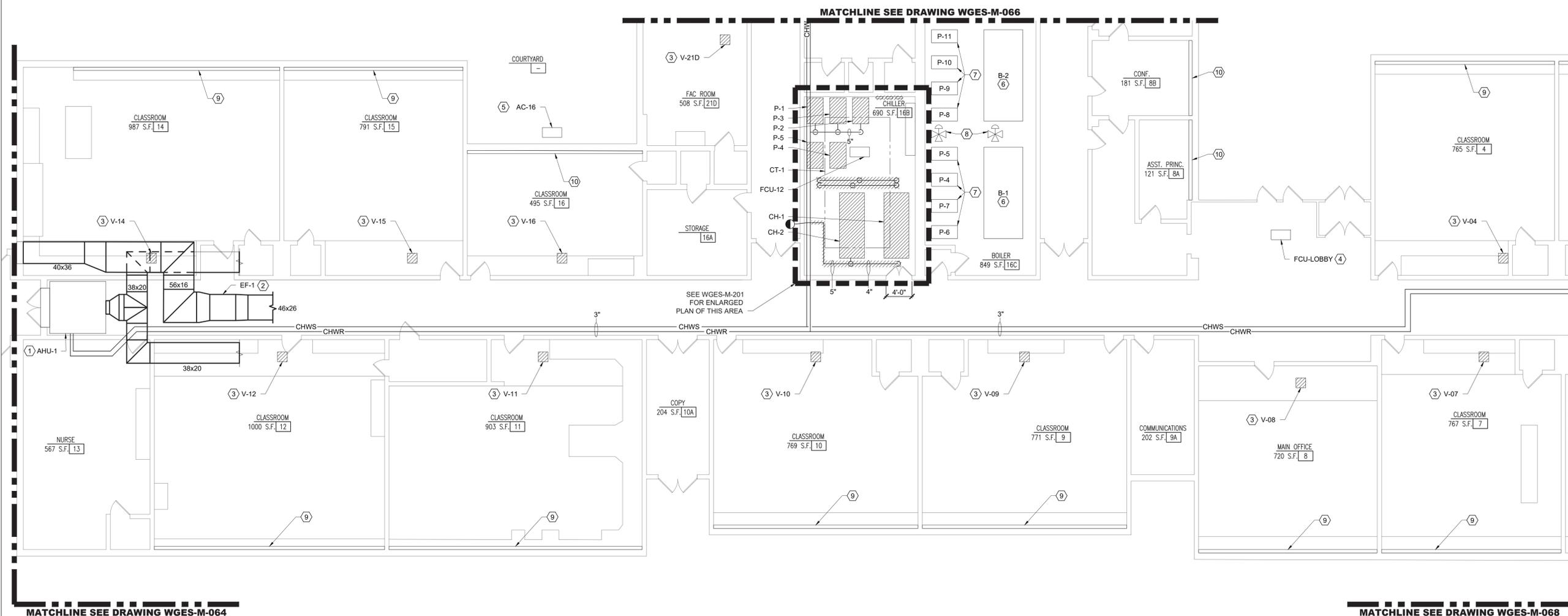
**GREENMAN PEDERSEN, INC.**  
 Mechanical Electrical Engineer  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10061

**GREENMAN PEDERSEN, INC.**  
 Structural Engineer  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10061

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
 SED# 50-02-01-06-0-030-016  
 105 POND DR  
 TIRRELL, NY 10984  
 COUNTY OF ROCKLAND

**MSA**  
**MICHAEL SHILALE ARCHITECTS, L.L.P.**  
 140 Park Avenue New York, NY 10022 Tel 845-708-0200  
 www.msaarch.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
 Drawing Title: **MECHANICAL MAIN LEVEL DEMOLITION - 4**  
 Drawing No.: **WGES-M-067**



**1 MAIN LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"





MATCHLINE SEE DRAWING WGES-M-067

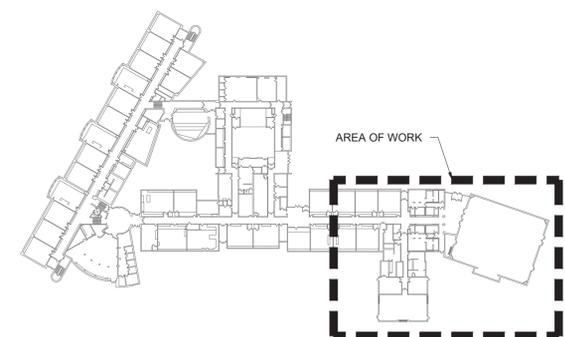
**1 MAIN LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"

**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE



**KEYED NOTES:**

- ① REFURBISH AIR HANDLING UNIT, AHU-2, ABOVE THE CEILING IN THE CORRIDOR (ALT. NO. 202).
- ② REFURBISH EXHAUST FAN, EF-2 ABOVE THE CEILING IN THE CORRIDOR (ALT. NO. 202).
- ③ DEMOLISH THE VAV BOX ABOVE THE CEILING (TRANE MODEL VCCD).
- ④ AIR HANDLING UNIT (MCQUAY MODEL CAH012FDAC, 15 TON) TO REMAIN.
- ⑤ DEMOLISH VERTICAL UNIT VENTILATOR.
- ⑥ FINNED TUBE HEATING ELEMENT RECESSED WITHIN WOODEN CASEWORK TO REMAIN.
- ⑦ FINNED TUBE RADIATOR TO REMAIN.
- ⑧ UNIT HEATER TO REMAIN.



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

REC. EXP. DATE: 04-30-24

Drawn by	Checked by	Project No.	Scale	Date
		42054		09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUFFERN, NY 10901	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUFFERN, NY 10901
Mechanical Structural Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 PINE ST. TROY, NY 10984  
COUNTY OF ROCKLAND



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title: **MECHANICAL MAIN LEVEL DEMOLITION - 5**  
Drawing No.: **WGES-M-068**



**KEYED NOTES:**

- ① AIR HANDLING UNIT (MCQUAY MODEL LHD) TO REMAIN.
- ② DEMOLISH SECTION OF SUPPLY DUCT AND TEMPORARILY CAP OPENINGS.

**1 UPPER LEVEL FLOOR PLAN DEMOLITION**  
SCALE: 1/8" = 1' - 0"

**2 UPPER LEVEL KEY PLAN**  
SCALE: NONE



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.

Drawing Title  
**MECHANICAL UPPER LEVEL DEMOLITION**

Drawing No.  
**WGES-M-069**



**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
TOWN OF TOWNSEND, NY 10984  
COUNTY OF ROCKLAND

Mechanical Electrical Engineer:

**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SUDBURY, NY 10961

Structural Engineer:

**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SUDBURY, NY 10961

Drawn by: MEP  
Checked by: PV  
Project No.: 42054  
Scale: AS NOTED  
Date: 09-14-23

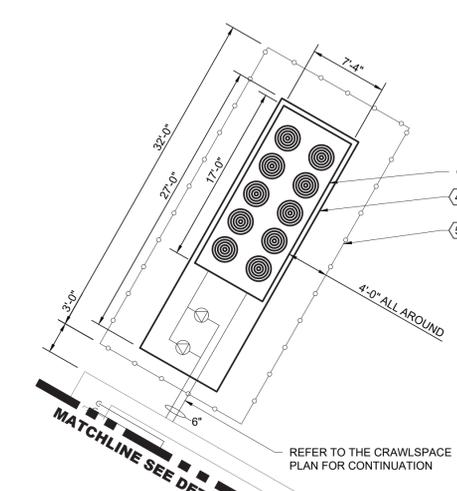
REC. EXP. DATE: 04-30-24

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



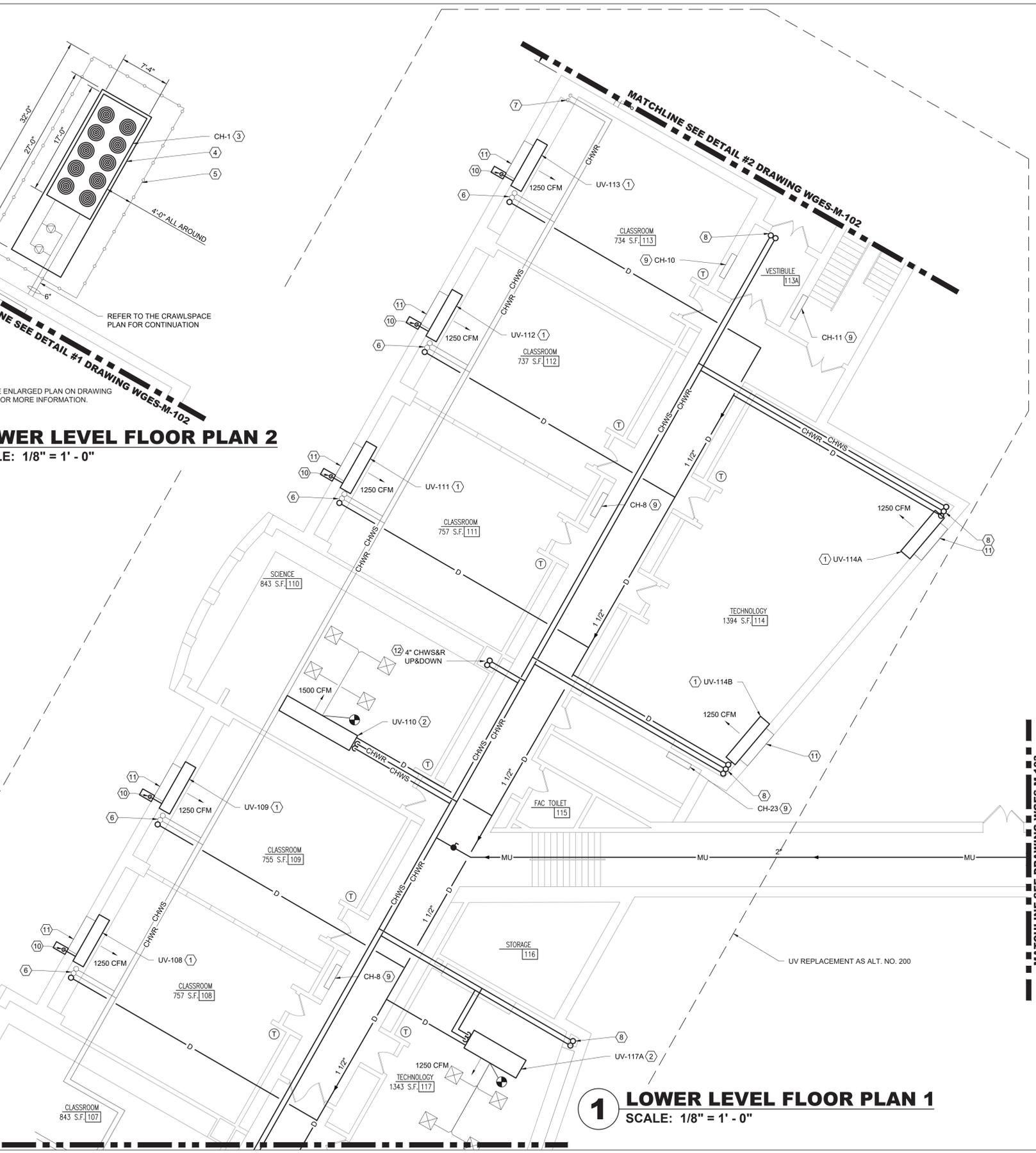






NOTES:  
1. REFER TO THE ENLARGED PLAN ON DRAWING WGES-M-201 FOR MORE INFORMATION.

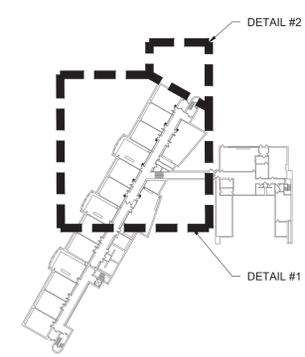
**2 LOWER LEVEL FLOOR PLAN 2**  
SCALE: 1/8" = 1' - 0"



**1 LOWER LEVEL FLOOR PLAN 1**  
SCALE: 1/8" = 1' - 0"

**KEYED NOTES:**

- ① BASE BID: RETROFIT THE EXISTING UNIT VENTILATOR BY PROVIDING A FOUR PIPE COIL AS SPECIFIED IN THE UNIT VENTILATOR SCHEDULE ON M003.  
ALT NO. 200: VERTICAL UNIT VENTILATOR. CONNECT D, CHW, AND HW PIPING.
- ② BASE BID: PROVIDE CHILLED WATER PIPING AS SHOWN ON THE PLAN AND CONNECT TO THE EXISTING UNIT VENTILATOR.  
ALT NO. 200: HORIZONTAL UNIT VENTILATOR ABOVE CEILING. CONNECT CD, CHW, AND HW PIPING.
- ③ AIR COOLED CHILLER (CH-1) SUPPORTED ON DUNNAGE AT GRADE.
- ④ NEW CONCRETE PAD ON GRADE, SEE STRUCTURAL.
- ⑤ CHAIN LINK FENCE ENCLOSURE AT CHILLER BY GC. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
- ⑥ EX. 1 1/4" CHWS & R UP THROUGH FLOOR TO UNIT VENTILATOR ON SECOND FLOOR.
- ⑦ EX. 2" CHWS & R DN TO CRAWLSPACE.
- ⑧ 1 1/4" CHWS & R UP THROUGH FLOOR TO UNIT VENTILATOR ON SECOND FLOOR.
- ⑨ EXISTING RECESSED CABINET HEATER. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑩ 3/4" CONDENSATE DRAIN TO SPLASH BLOCK AT GRADE.
- ⑪ CONNECT TO EXISTING OA LOUVER.
- ⑫ CUT AND PATCH THE EXISTING CMU SHAFT TO INSTALL THE PIPE RISER.



**3 LOWER LEVEL KEY PLAN**  
SCALE: NONE

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

REC. EXP. DATE: 04-30-24

Drawn by	MEP	PV	42054
Checked by			
Project No.			
Scale			AS NOTED
Date			09-14-23

Mechanical Structural Engineer:	GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201
	GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201

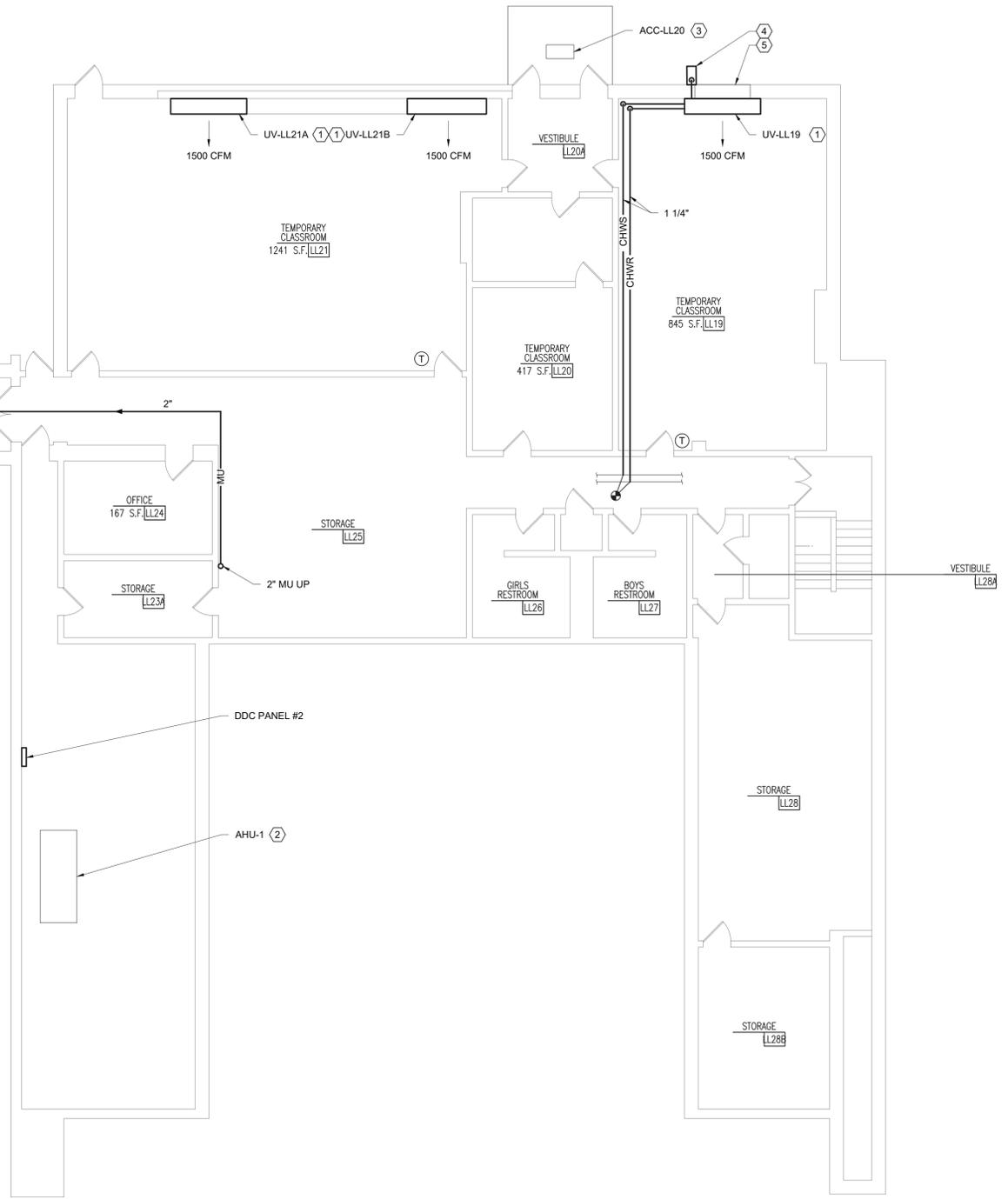
UNIVENT REPLACEMENT  
AT  
WILLOW GROVE  
ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
145 PRINCE OF  
WILHELM ST.  
TROY, NY 12064  
COUNTY OF ROCKLAND



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL LOWER  
LEVEL INSTALLATION  
PLAN - 2**  
Drawing No.  
**WGES-M-102**



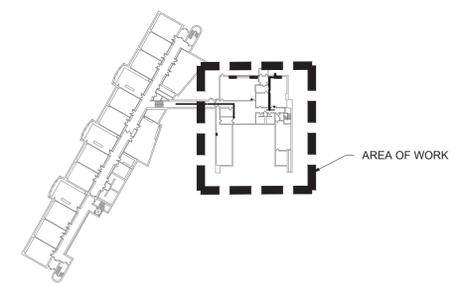
MATCHLINE SEE DRAWING WGES-M-102



**KEYED NOTES:**

- ① VERTICAL UNIT VENTILATOR. CONNECT TO D, CHW, AND HW PIPING AND OA INTAKE LOUVER.
- ② EXISTING BAND ROOM AHU-1 TO BE INTEGRATED WITH THE BMS.
- ③ EXISTING ACC-1 ON AWNING ABOVE DOOR TO REMAIN.
- ④ 3/4" CONDENSATE DRAIN TERMINATES AT SPLASH BLOCK AT GRADE.
- ⑤ CONNECT TO THE EXISTING OA INTAKE LOUVER.

**1 LOWER LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/8" = 1' - 0"



**2 LOWER LEVEL KEY PLAN**  
SCALE: NONE



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

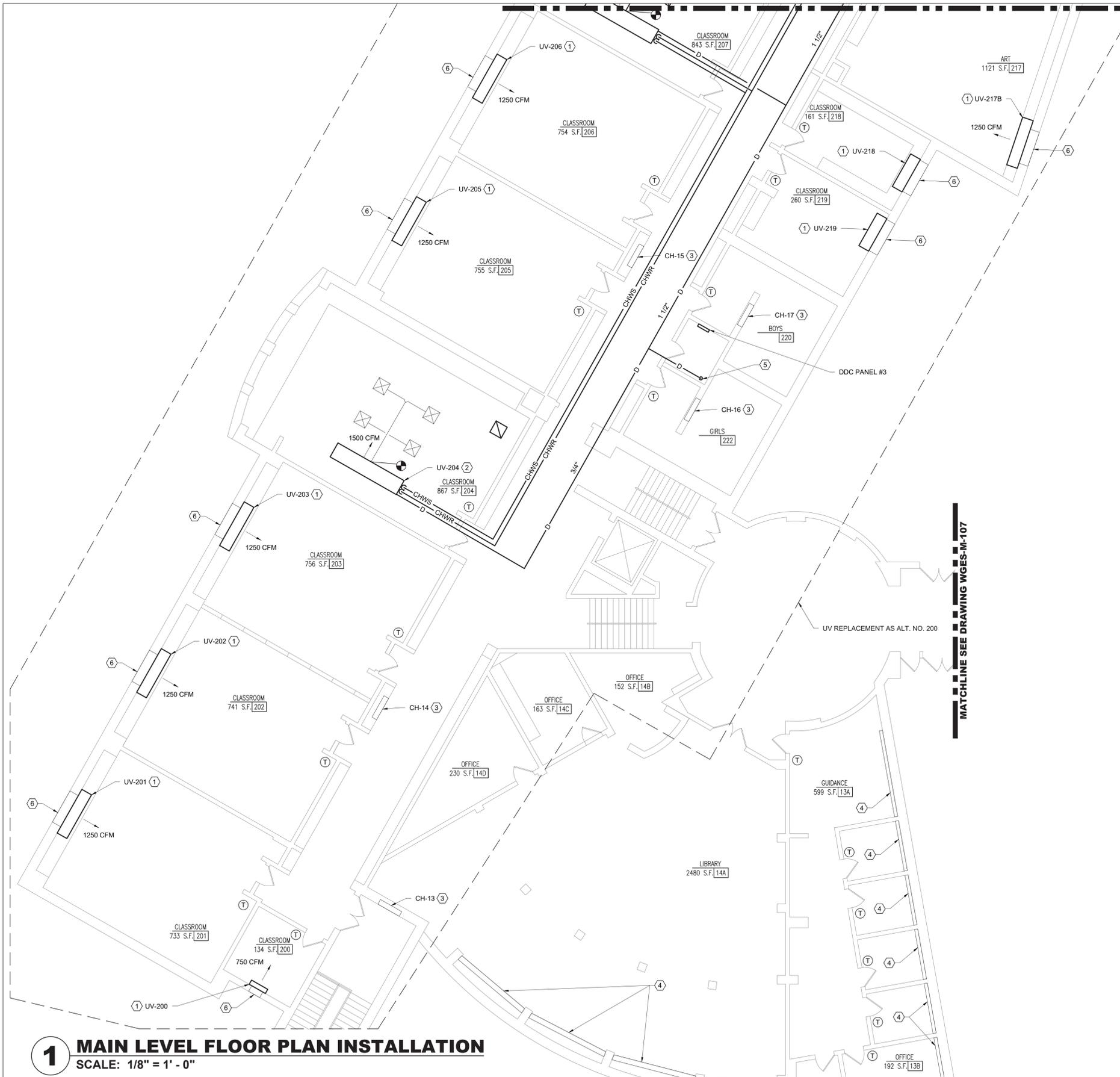
Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	AS-NOTED
Date	09-14-23
REC. EXP. DATE: 04-30-24	

Mechanical Electrical Engineer:	GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201
	GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201
Structural Engineer:	

UNIVENT REPLACEMENT  
AT  
WILLOW GROVE  
ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
COUNTY OF ROCKLAND  
TOWN OF TOWN OF  
TOWN OF



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL LOWER  
LEVEL INSTALLATION  
PLAN - 3**  
Drawing No.  
**WGES-M-103**



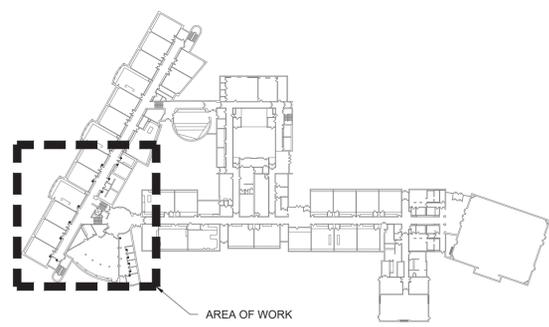
MATCHLINE SEE DRAWING WGES-M-105

**KEYED NOTES:**

- ① BASE BID: RETROFIT THE EXISTING UNIT VENTILATOR BY PROVIDING A FOUR PIPE COIL AS SPECIFIED IN THE UNIT VENTILATOR SCHEDULE ON M003.  
ALT NO. 200: VERTICAL UNIT VENTILATOR. CONNECT D, CHW, AND HW PIPING.
- ② BASE BID: PROVIDE CHILLED WATER PIPING AS SHOWN ON THE PLAN AND CONNECT TO THE EXISTING UNIT VENTILATOR.  
ALT NO. 200: HORIZONTAL UNIT VENTILATOR ABOVE CEILING. CONNECT CD, CHW, AND HW PIPING.
- ③ EXISTING RECESSED CABINET HEATER. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ④ EXISTING FINNED TUBE RADIATOR. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑤ TERMINATE 1 1/2" CONDENSATE DRAIN AT THE EXISTING SERVICE SINK.
- ⑥ CONNECT TO THE EXISTING OA INTAKE LOUVER.

MATCHLINE SEE DRAWING WGES-M-107

**1 MAIN LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/8" = 1' - 0"



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE

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

REC. EXP. DATE: 04-30-24

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	AS NOTED
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 STURBRIDGE, NY 10981	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 STURBRIDGE, NY 10981
Mechanical Electrical Engineer:	Structural Engineer:

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 PINE ST. TOWN, NY 10984  
COUNTY OF ROCKLAND



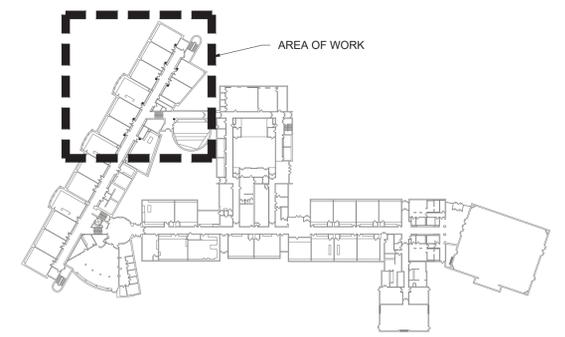
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title: **MECHANICAL MAIN LEVEL INSTALLATION PLAN - 1**  
Drawing No.: **WGES-M-104**



**1 MAIN LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/8" = 1' - 0"

**KEYED NOTES:**

- ① BASE BID: RETROFIT THE EXISTING UNIT VENTILATOR BY PROVIDING A FOUR PIPE COIL AS SPECIFIED IN THE UNIT VENTILATOR SCHEDULE ON M003.
- ALT NO. 200: VERTICAL UNIT VENTILATOR. CONNECT D, CHW, AND HW PIPING.
- ② BASE BID: PROVIDE CHILLED WATER PIPING AS SHOWN ON THE PLAN AND CONNECT TO THE EXISTING UNIT VENTILATOR.
- ALT NO. 200: HORIZONTAL UNIT VENTILATOR ABOVE CEILING. CONNECT CD, CHW, AND HW PIPING.
- ③ VERTICAL FAN COIL UNIT. CONNECT D, CHW, AND HW PIPING.
- ④ EXISTING RECESSED CABINET HEATER. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑤ EXISTING FINNED TUBE RADIATOR. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑥ CONNECT TO THE EXISTING OA INTAKE LOUVER.
- ⑦ CUT AND PATCH THE EXISTING CMU SHAFT TO INSTALL THE PIPE RISER.



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE



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

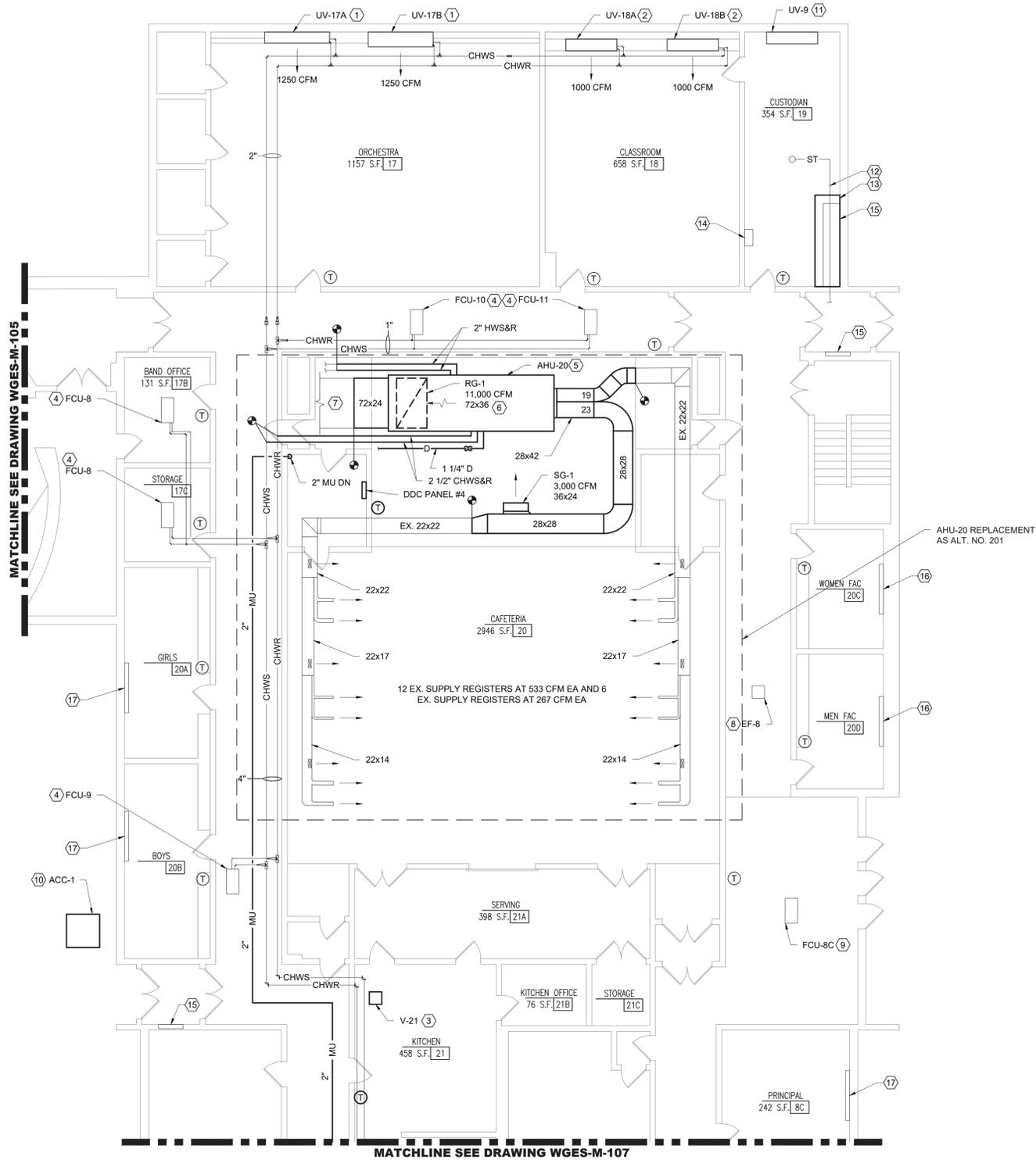
Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	AS NOTED
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUFFERN, NY 10981	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUFFERN, NY 10981
Mechanical Electrical Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
140 PARK AVENUE NEW CITY, NY 10958 TEL 845-708-0200  
www.univent.com  
TOWN OF TOWNSEND, NY 10984  
COUNTY OF ROCKLAND



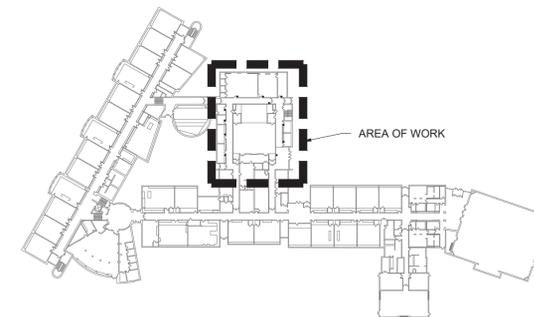
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL MAIN LEVEL INSTALLATION PLAN - 2**  
Drawing No.  
**WGES-M-105**



**1 MAIN LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/8" = 1' - 0"

**KEYED NOTES:**

- ① VERTICAL UNIT VENTILATOR (1250 CFM). CONNECT D, CHW, AND HW PIPING. CONNECT TO EXISTING OA INTAKE LOUVER.
- ② VERTICAL UNIT VENTILATOR (1000 CFM). CONNECT D, CHW, AND HW PIPING. CONNECT TO EXISTING OA INTAKE LOUVER.
- ③ VAV BOX ABOVE THE CEILING.
- ④ EX. HORIZONTAL FAN COIL UNIT ABOVE THE CEILING. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ⑤ BASE BID: INTEGRATE THE EXISTING AHU-20 AND RETURN FAN INTO THE BMS.  
ALT. NO. 201: CAFETERIA AIR HANDLING UNIT (AHU-20) AT CEILING. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS. CONNECT D, CHW, AND HW PIPING. REPLACE CONTROLS ONLY UNDER THE BASE BID AND REPLACE THE ENTIRE UNIT UNDER ALTERNATE NO. 201.
- ⑥ RETURN GRILL AT BOTTOM OF AHU.
- ⑦ CONNECT TO THE EXISTING OA DUCT IN THE ROOM ABOVE.
- ⑧ EX. TOILET EXHAUST FAN ABOVE THE CEILING. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ⑨ EX. FAN COIL UNIT ABOVE THE CEILING. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ⑩ SPLIT SYSTEM AC UNIT ACC-1 INTERLOCKED WITH THE BAND ROOM AHU-1. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS (INTERNATIONAL COMFORT MODEL CAS120HDA0A00AA, 10 TONS COOLING).
- ⑪ EXISTING VERTICAL UNIT VENTILATOR PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑫ EXISTING 4" STORM PIPE AT CEILING.
- ⑬ PROVIDE A DRIP PAN BELOW THE EXISTING STORM PIPE THAT RUNS ABOVE THE SWITCHGEAR. THE DRIP PAN SHALL BE AT LEAST 12" LARGER THAN THE FOOTPRINT OF THE SWITCHGEAR IN ALL DIRECTIONS. PROVIDE 22 GAUGE GALVANIZED PAN WITH 2" HIGH SIDES AND A 3/4" COPPER DRAIN TERMINATING 6" AFF.
- ⑭ EXISTING FUEL OIL TANK GAUGING AND LEAK DETECTION SYSTEM TO BE INTERGRATED WITH THE BMS (ONMTEC PROTEUS).
- ⑮ EXISTING ELECTRICAL SWITCHGEAR. REFER TO THE ELECTRICAL DRAWINGS.
- ⑯ EXISTING RECESSED CONVECTOR. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑰ EXISTING FINNED TUBE RADIATOR. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

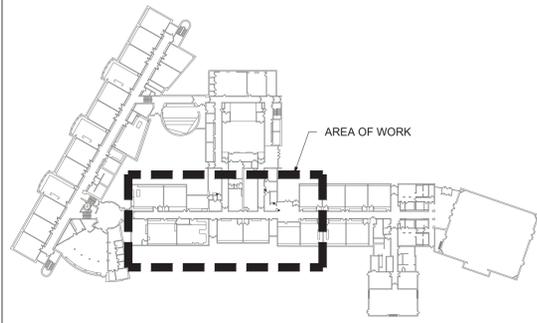
Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	AS NOTED
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861
Mechanical Electrical Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
140 PARK AVENUE NEW CITY, NY 10956 TEL 845-708-5000  
www.univent.com  
TOWN OF SUDBURY, NY 10864  
COUNTY OF ROCKLAND



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title: **MECHANICAL MAIN LEVEL INSTALLATION PLAN - 3**  
Drawing No.: **WGES-M-106**



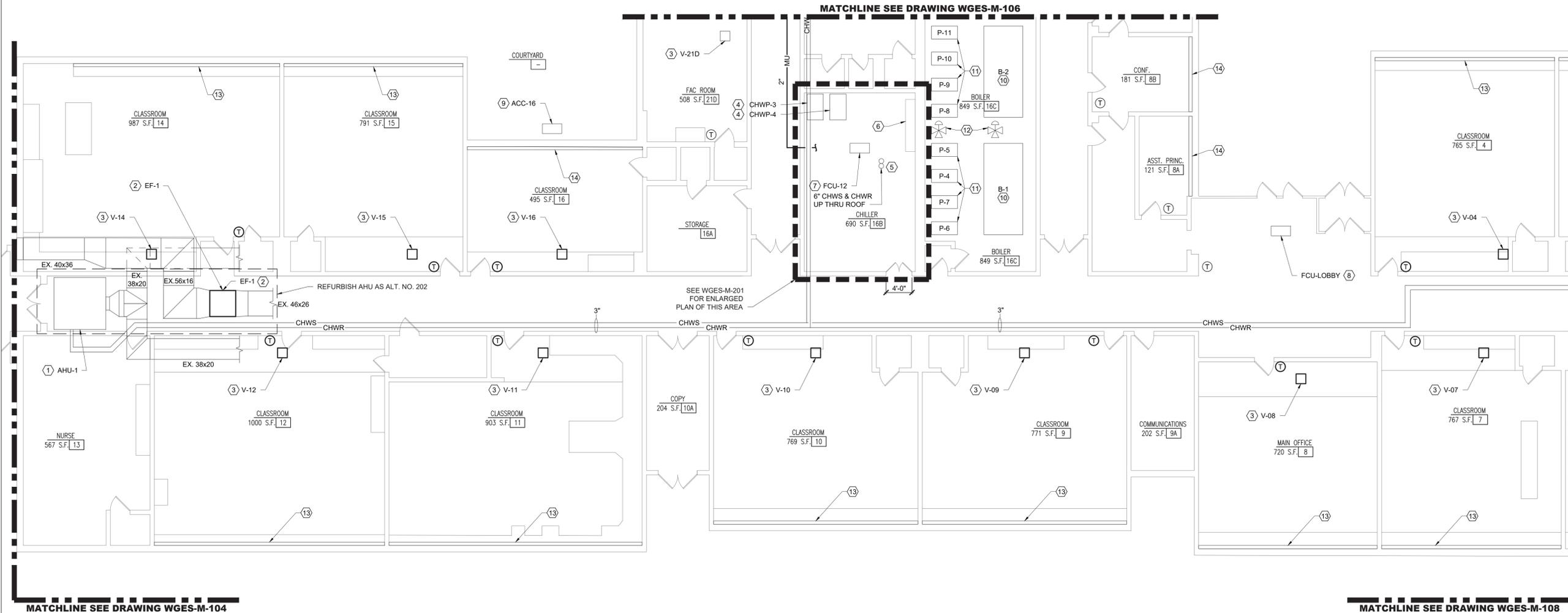
**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE

**KEYED NOTES:**

- ① BASE BID: INTEGRATE THE EXISTING AIR HANDLING UNIT INTO THE BMS.  
ALT NO. 202: EX. AIR HANDLING UNIT, AHU-1, ABOVE THE CEILING IN THE CORRIDOR TO BE REFURBISHED.  
- THE WORK INCLUDES:
  - PROVIDE DIRECT DIGITAL CONTROLS. REFER TO THE CONTROL DIAGRAMS.
  - REPLACE OA, EA, AND RA DAMPERS.
  - REPLACE FAN SHAFT BEARINGS.
  - REMOVE THE INLET VANE DAMPERS
  - REPLACE THE EX. 15 HP MOTOR WITH A 15 HP NEMA PREMIUM VFD READY MOTOR.
  - REPLACE V-BELTS AND FAN AND MOTOR SHEAVES.
- ② BASE BID: INTEGRATE THE EXISTING EXHAUST FAN INTO THE BMS.  
ALT NO. 202: EX. EXHAUST FAN, EF-1, ABOVE THE CEILING IN THE CORRIDOR TO BE REFURBISHED.  
- THE WORK INCLUDES:
  - PROVIDE DIRECT DIGITAL CONTROLS. REFER TO THE CONTROL DIAGRAMS.
  - REPLACE THE FAN SHAFT BEARINGS.
  - REPLACE THE EX. 3 HP MOTOR WITH A 3 HP NEMA PREMIUM, VFD READY MOTOR.
  - REPLACE THE V-BELTS AND FAN AND MOTOR SHEAVES.
- ③ VAV BOX ABOVE THE CEILING.
- ④ BASE-MOUNTED, END-SUCTION CHILLED WATER PUMPS INCLUDING PIPING, CONTROLS, AND APPURTENANCES.
- ⑤ 6" CHWS AND CHWR PIPES UP THRU ROOF.
- ⑥ EXISTING ELECTRICAL EQUIPMENT. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ⑦ EX. FAN COIL UNIT AT THE CEILING. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.

**KEYED NOTES (CONTINUED):**

- ⑧ EX. FAN COIL UNIT ABOVE THE CEILING. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ⑨ EXISTING AIR COOLED CONDENSING UNIT TO REMAIN.
- ⑩ EXISTING BOILER. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. (WEIL MCLAIN MODEL 1894).
- ⑪ EXISTING HOT WATER PUMPS. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑫ EXISTING 4" 3-WAY CONTROL VALVE. PROVIDE AN ELECTRONIC ACTUATOR AND DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑬ EXISTING FINNED TUBE HEATING ELEMENT RECESSED WITHIN WOODEN CASEWORK. PROVIDE AND ELECTRONIC ACTUATOR AND DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑭ EXISTING FINNED TUBE RADIATOR. PROVIDE AND ELECTRONIC ACTUATOR AND DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.



**1 MAIN LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/8" = 1' - 0"

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

REC. EXP. DATE: 04-30-24

Drawn by	MEP	PV	42054
Checked by			
Project No.			AS NOTED
Scale			09-14-23
Date			

**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SUFFERN, NY 10981

Mechanical Electrical Engineer

**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SUFFERN, NY 10981

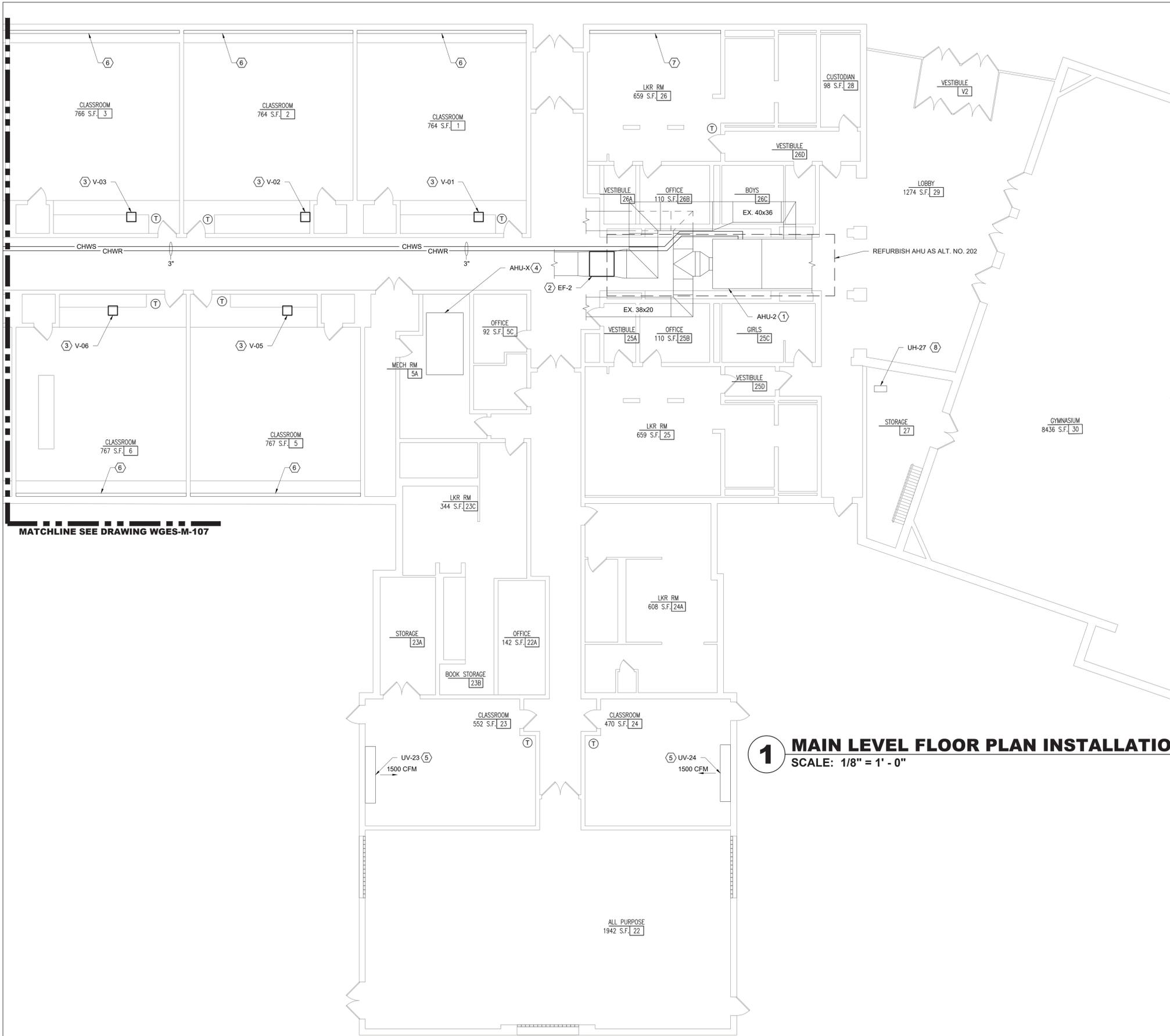
Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 PINE ST. 3RD FLOOR  
TIBOLA, NY 10984  
COUNTY OF ROCKLAND

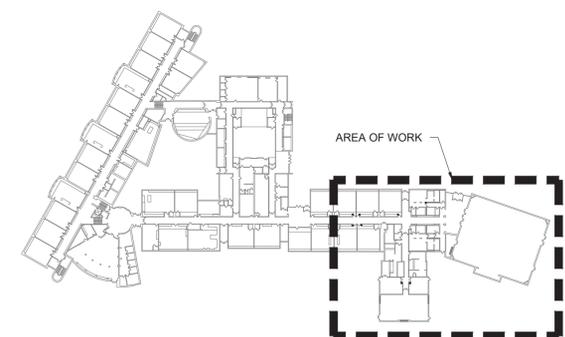
**HSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10056 Tel 845-708-5000  
www.hsaarch.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL MAIN LEVEL INSTALLATION PLAN - 4**  
Drawing No.  
**WGES-M-107**





**1 MAIN LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/8" = 1' - 0"



**2 MAIN LEVEL KEY PLAN**  
SCALE: NONE

**KEYED NOTES:**

- ① BASE BID: INTEGRATE THE EXISTING AIR HANDLING UNIT INTO THE BMS.  
ALT. NO. 202: EX. AIR HANDLING UNIT, AHU-2, ABOVE THE CEILING IN THE CORRIDOR TO BE REFURBISHED.  
- THIS WORK INCLUDES
  - PROVIDE DIRECT DIGITAL CONTROLS. REFER TO THE CONTROL DIAGRAM.
  - REPLACE OA, EA, AND RA DAMPERS.
  - REPLACE FAN SHAFT BEARINGS.
  - REMOVE THE INLET VANE DAMPERS.
  - REPLACE THE EX. 15 HP MOTOR WITH A 15 HP NEMA PREMIUM, VFD READY MOTOR.
  - REPLACE V-BELTS AND FAN AND MOTOR SHEAVES.
- ② BASE BID: INTEGRATE THE EXISTING EXHAUST FAN INTO THE BMS.  
ALT. NO. 202: EX. EXHAUST FAN, EF-2 ABOVE THE CEILING IN THE CORRIDOR TO BE REFURBISHED.  
- THIS WORK INCLUDES
  - PROVIDE DIRECT DIGITAL CONTROLS. REFER TO THE CONTROL DIAGRAMS.
  - REPLACE THE FAN SHAFT BEARINGS.
  - REPLACE THE EX. 3 HP MOTOR WITH A 3 HP NEMA PREMIUM, VFD READY MOTOR.
  - REPLACE THE V-BELTS AND FAN AND MOTOR SHEAVES.
- ③ VAV BOX ABOVE THE CEILING.
- ④ EX. AIR HANDLING UNIT. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ⑤ VERTICAL UNIT VENTILATOR. CONNECT D, CHW, AND HW PIPING. CONNECT TO THE EXISTING OA INTAKE LOUVER.
- ⑥ EXISTING FINNED TUBE HEATING ELEMENT RECESSED WITHIN WOODEN CASEWORK. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑦ EXISTING FINNED TUBE RADIATOR. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.
- ⑧ EXISTING UNIT HEATER. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS.

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

REC. EXP. DATE: 04-30-24  
09-14-23

Drawn by	MEP	PV
Checked by		
Project No.	42054	
Scale	AS NOTED	
Date	09-14-23	

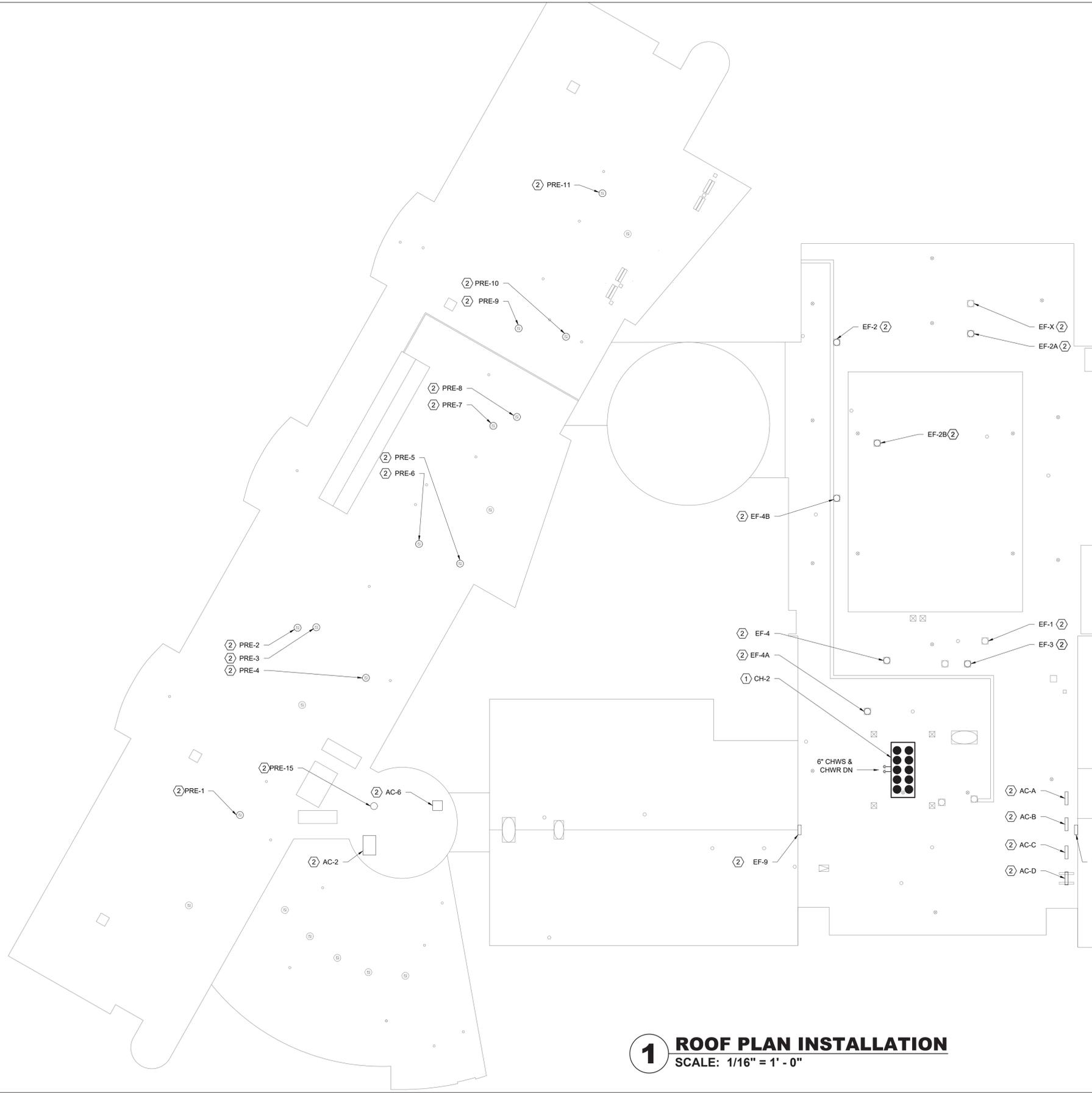
<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10864	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10864
Mechanical Structural Engineer	Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 ROUTE 9B  
TIBOLA, NY 10984  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10022 Tel 845-708-5000  
www.msaarch.com

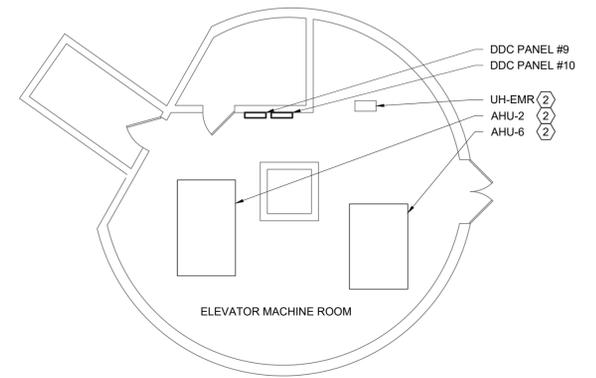
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL MAIN LEVEL INSTALLATION PLAN - 5**  
Drawing No.  
**WGES-M-108**



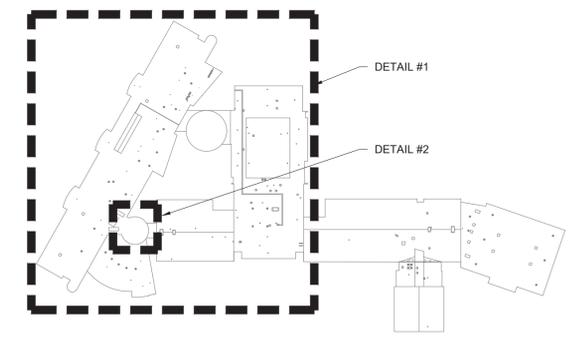


**1 ROOF PLAN INSTALLATION**  
SCALE: 1/16" = 1' - 0"

- KEYED NOTES:**
- ① AIR-COOLED CHILLER ON THE ROOF. PROVIDE STEEL DUNNAGE TO SUIT THE FOOTPRINT OF THE CHILLER. REFER TO THE STRUCTURAL DRAWINGS FOR DETAILS.
  - ② EXISTING MECHANICAL EQUIPMENT. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.



**2 ELEVATOR MACHINE ROOM PLAN**  
SCALE: 1/8" = 1' - 0"



**3 ROOF KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
Checked by: PV  
Project No.: 42054  
Scale: AS NOTED  
Date: 09-14-23

**GREENMAN PEDERSEN, INC.**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
STURZENEGGER, NY 10981  
Mechanical Electrical Engineer

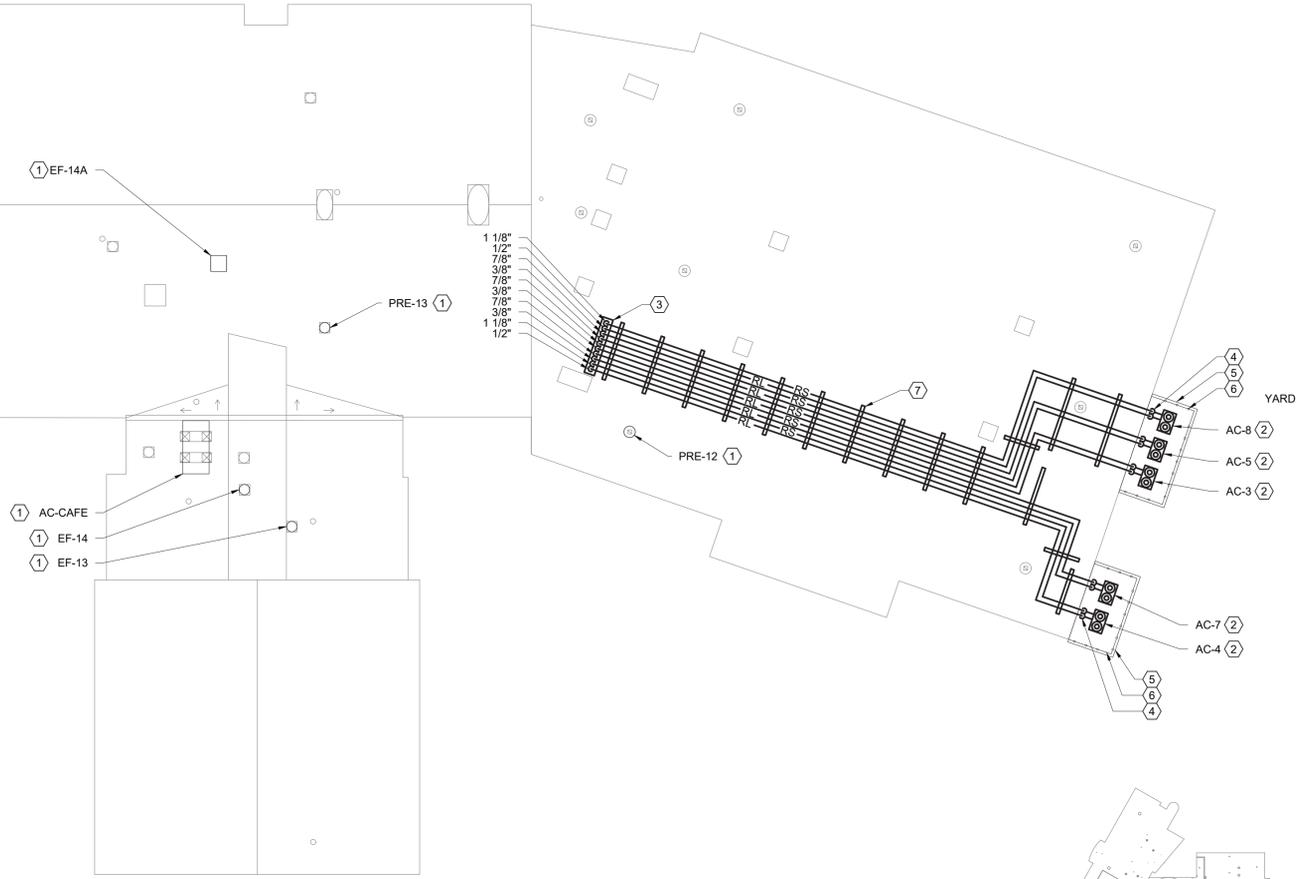
**GREENMAN PEDERSEN, INC.**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
STURZENEGGER, NY 10981  
Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
U.S. OFFICE OF THERMAL ENERGY STORAGE  
THERMAL ENERGY STORAGE  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10058 Tel 845-708-5000  
www.msaarch.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title: **MECHANICAL ROOF INSTALLATION PLAN - 1**  
Drawing No.: **WGES-M-110**

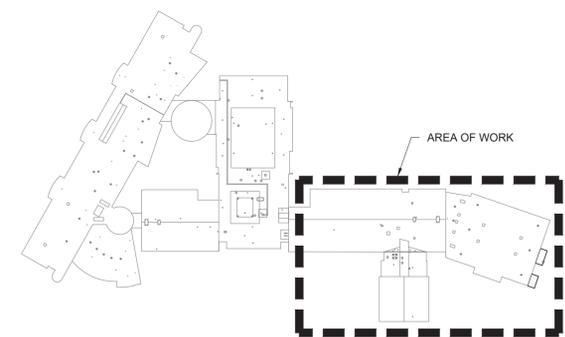
MATCHLINE SEE DRAWING WGES-M-110



**1 ROOF LEVEL FLOOR PLAN INSTALLATION**  
SCALE: 1/16" = 1' - 0"

**KEYED NOTES:**

- ① EXISTING MECHANICAL EQUIPMENT. PROVIDE DIRECT DIGITAL CONTROLS INTEGRATED WITH THE BMS. REFER TO THE CONTROL DIAGRAMS FOR MORE DETAILS.
- ② PROVIDE SPLIT SYSTEM AIR CONDITIONING UNITS AS SHOWN.
- ③ PROVIDE ROOF CURB WITH PIPE PORTAL WHERE REFRIGERANT PIPING RUNS DOWN THROUGH THE ROOF. PROVIDE WATERTIGHT PENETRATION COMPATIBLE WITH THE EXISTING ROOFING SYSTEM. SEE DRAWING WGES-M-109 FOR CONTINUATION.
- ④ PROVIDE THREE (3) SETS 3/8" RL AND 7/8" RS AND TWO (2) SETS 1/2" RL AND 1-1/8" RS. INSTALL WITHIN LINESET COVER ALONG THE WALL AT 10'-0" AFFX. PAINT THE LINESET COVERS TO MATCH THE WALL IN A COLOR TO BE SELECTED BY THE OWNER.
- ⑤ PROVIDE CONCRETE PAD AT GRADE TO SUPPORT AC UNITS. VERIFY THE ACTUAL DIMENSIONS AGAINST THE MANUFACTURER'S RECOMMENDED CLEARANCES.
- ⑥ CHAIN LINK FENCE ENCLOSURE BY GC. VERIFY THE ACTUAL DIMENSIONS AGAINST THE MANUFACTURER'S RECOMMENDED CLEARANCES.
- ⑦ PROVIDE REFRIGERANT PIPING ALONG ROOF WITH CURB SUPPORTS SPACED AT 8'-0" O.C. MAXIMUM. SUPPORTS SHALL BE COMPATIBLE WITH THE EXISTING ROOFING SYSTEM.



**2 ROOF KEY PLAN**  
SCALE: NONE



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL ROOF  
INSTALLATION PLAN - 2**

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10056 Tel 845-798-0200  
www.msaarch.com

**UNIVENT REPLACEMENT  
AT  
WILLOW GROVE  
ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
145 POND RD  
TIBOLA, NY 10984  
COUNTY OF ROCKLAND

**GREENMAN  
PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SUDBURY, NY 10961  
Mechanical  
Structural  
Engineer

Drawn by MEP  
Checked by PV  
Project No. 42054  
Scale AS NOTED  
Date 09-14-23

REC. EXP. DATE: 04-30-24

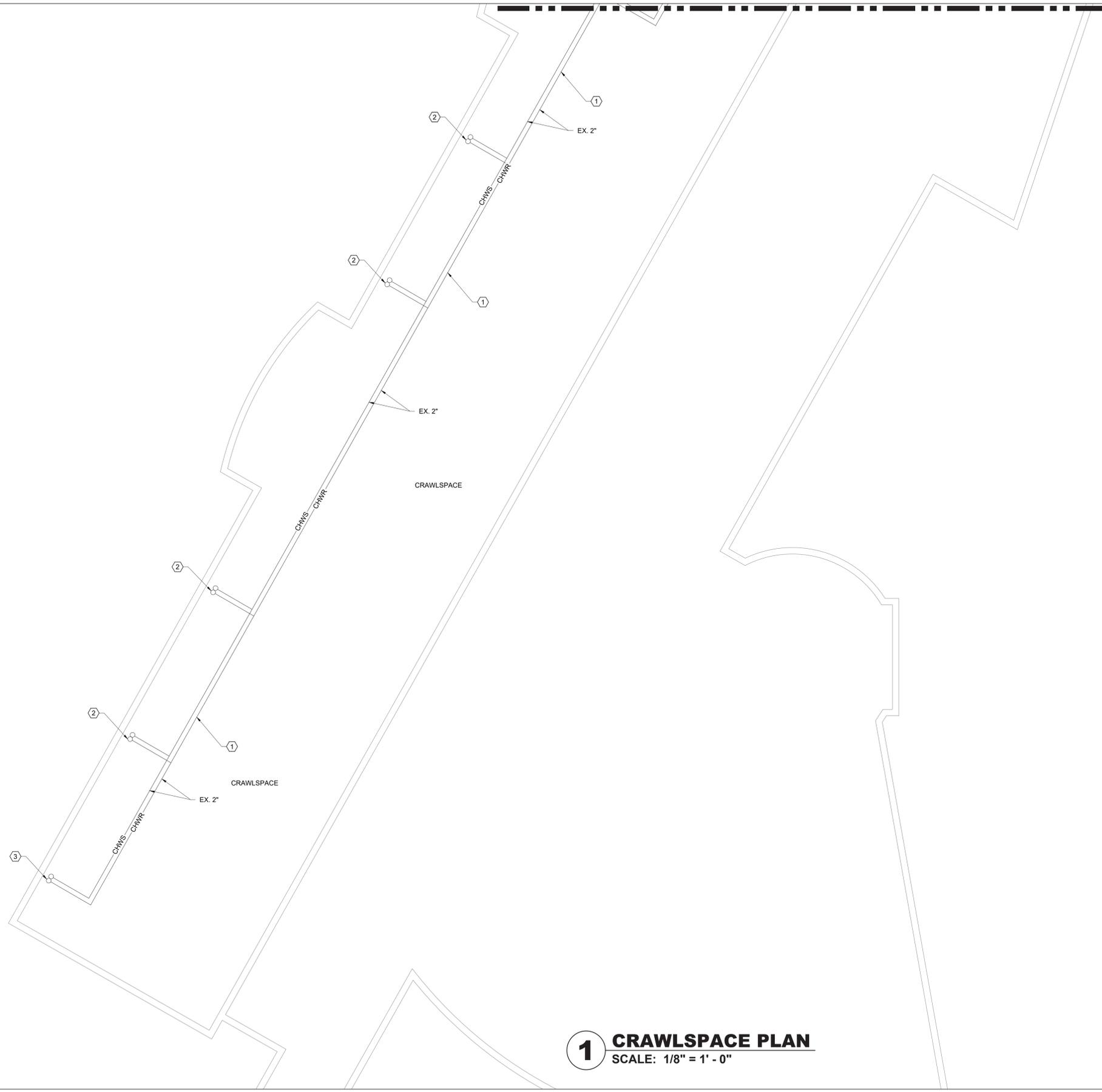
No.	Date	Revisions
3	09-14-23	BIDDING DOCUMENTS
2	06-09-23	SED ADDENDUM #1
1	12-28-22	BIDDING DOCUMENTS

Drawing No.  
**WGES-M-111**

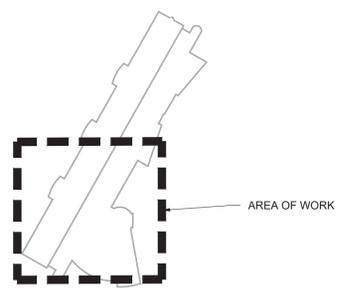
MATCHLINE SEE DRAWING WGES-M-113

**KEYED NOTES:**

- ① PERFORM A HYDROSTATIC TEST ON THE EXISTING CHILLED WATER PIPING AT THE CRAWLSPACE AND SUBMIT FOR APPROVAL PRIOR TO FABRICATION OR INSTALLATION OF THE CHILLED WATER PIPING IN THIS WING. UPON COMPLETION OF THE WORK, PERFORM TESTING AND BALANCING OF THE COMPLETED SYSTEM AS PER THE SPECIFICATIONS.
- ② EX. 1 1/4" CHWS & R UP THROUGH FLOOR TO UNIT VENTILATOR ON FIRST FLOOR.
- ③ EX. 2" CHWS & R UP TO 2ND FLOOR UNIT VENTILATORS.



**1 CRAWLSPACE PLAN**  
SCALE: 1/8" = 1' - 0"



**2 CRAWLSPACE KEY PLAN**  
SCALE: NONE



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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
 Checked by: PV  
 Project No.: 42054  
 Scale: AS NOTED  
 Date: 09-14-23

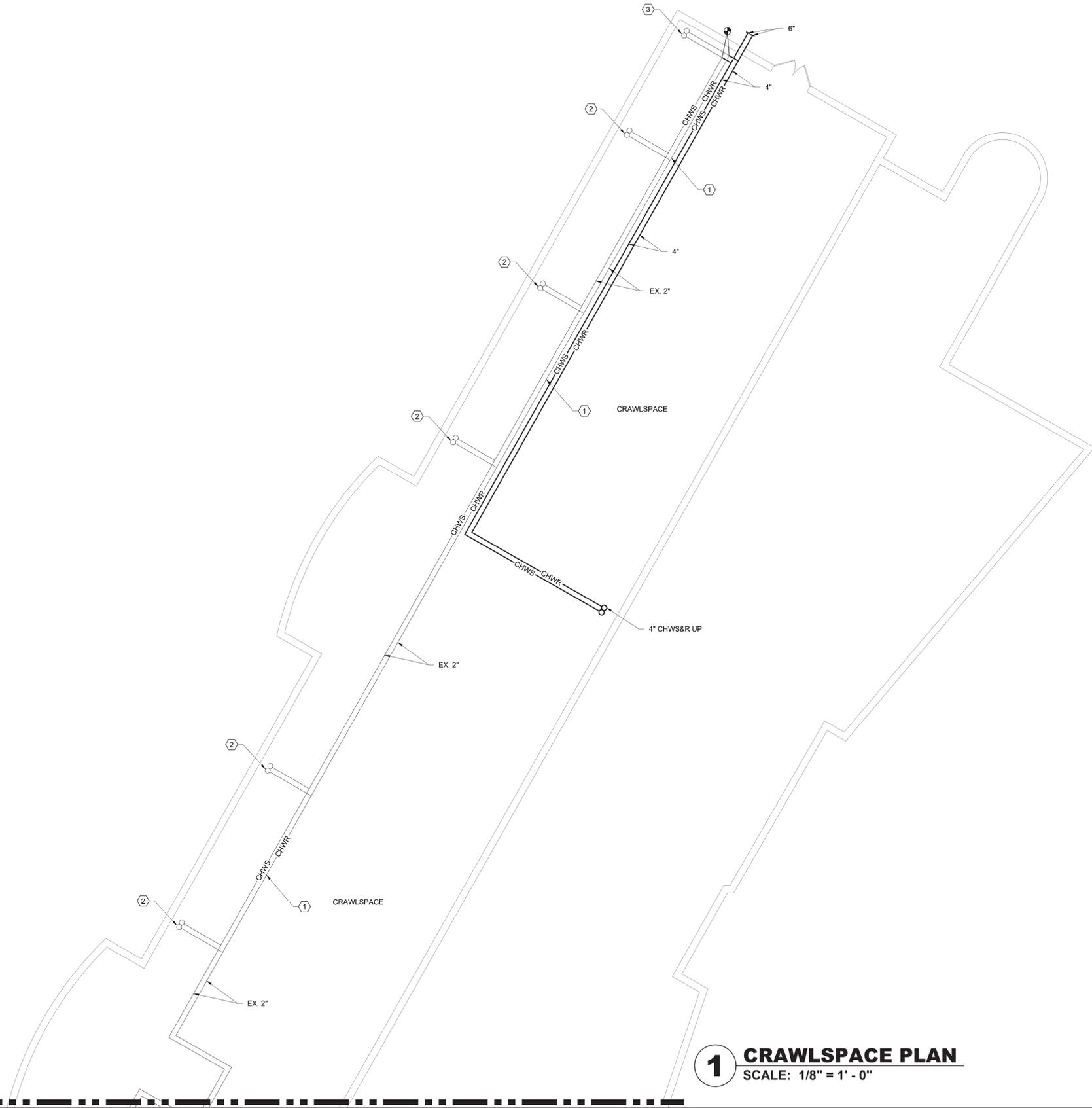
**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10901  
 Mechanical Electrical Engineer:  
**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10901  
 Structural Engineer:

UNIVENT REPLACEMENT  
 AT  
 WILLOW GROVE  
 ELEMENTARY SCHOOL  
 SED# 50-02-01-06-0-030-016  
 TOWN OF TOWNSEND, NY 10984  
 COUNTY OF ROCKLAND

**MSA**  
 MICHAEL SHILALE ARCHITECTS, L.L.P.  
 140 Park Avenue New York, NY 10056 Tel 845-798-9200  
 www.msaarch.com

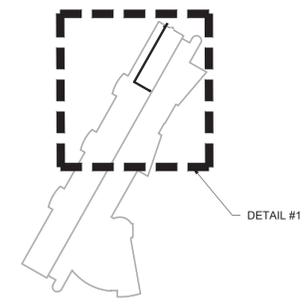
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
 Drawing Title:  
**MECHANICAL CRAWLSPACE INSTALLATION PLAN - 1**  
 Drawing No.:  
**WGES-M-112**

MATCHLINE SEE DRAWING WGES-M-112



**1 CRAWLSPACE PLAN**  
SCALE: 1/8" = 1' - 0"

- KEYED NOTES:**
- ① PERFORM A HYDROSTATIC TEST ON THE EXISTING CHILLED WATER PIPING AT THE CRAWLSPACE AND SUBMIT FOR APPROVAL PRIOR TO FABRICATION OR INSTALLATION OF THE CHILLED WATER PIPING IN THIS WING. UPON COMPLETION OF THE WORK, PERFORM TESTING AND BALANCING OF THE COMPLETED SYSTEM AS PER THE SPECIFICATIONS.
  - ② EX. 1 1/4" CHWS & R UP THROUGH FLOOR TO UNIT VENTILATOR ON FIRST FLOOR.
  - ③ EX. 2" CHWS & R UP TO 2ND FLOOR UNIT VENTILATORS.



**2 CRAWLSPACE KEY PLAN**  
SCALE: NONE



© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.

Drawing Title  
**MECHANICAL CRAWLSPACE INSTALLATION PLAN - 2**

Drawing No.  
**WGES-M-113**

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
SED# 50-02-01-06-0-030-016  
140 PARK AVENUE NEW YORK, NY 10016 TEL 845-798-9200  
TOWN OF TOWNSEND, NY 10984  
COUNTY OF ROCKLAND



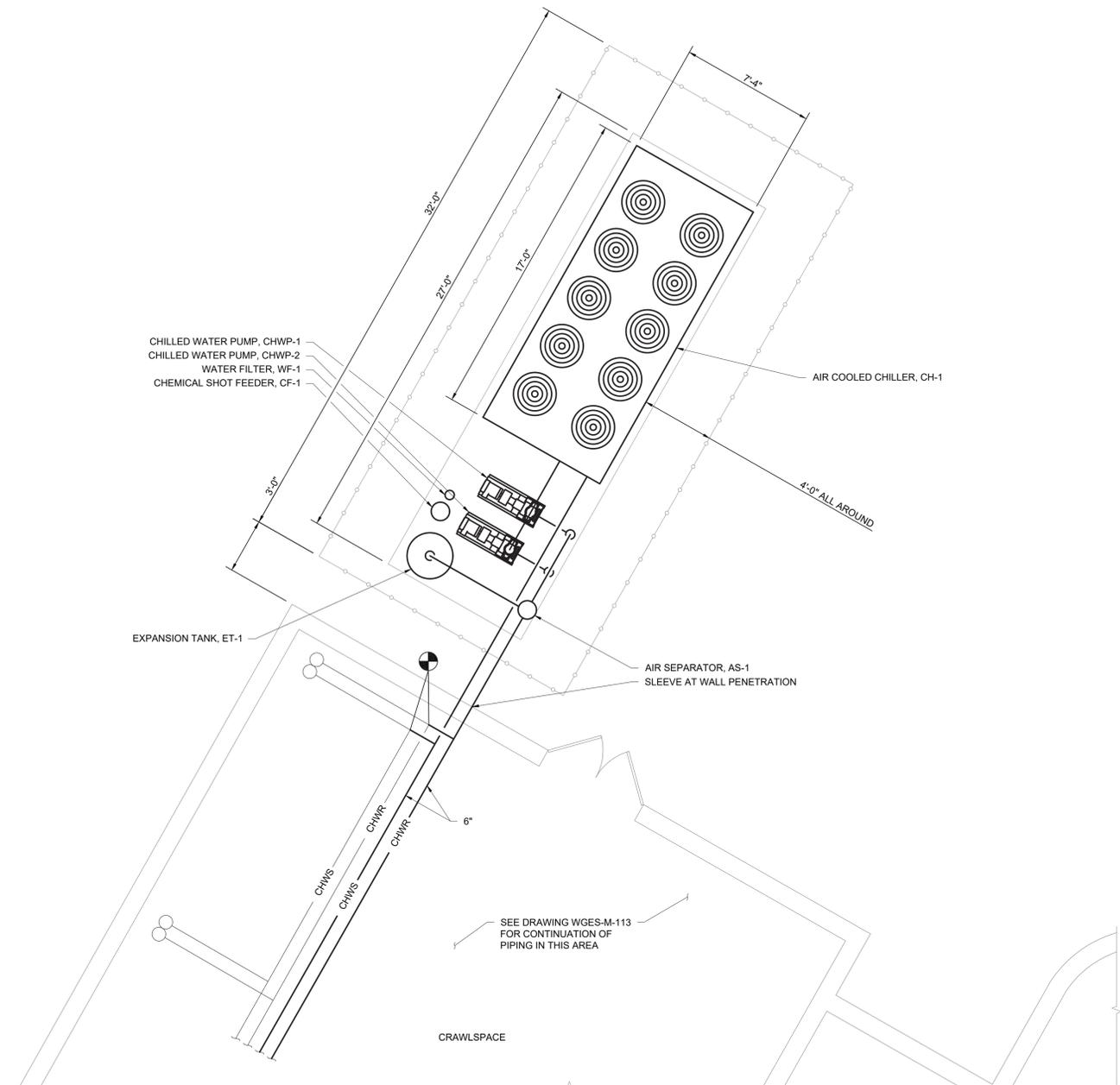
Mechanical Electrical Engineer:  
**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD SUITE 200 SUDBURY, NY 10901

Structural Engineer:  
**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD SUITE 200 SUDBURY, NY 10901

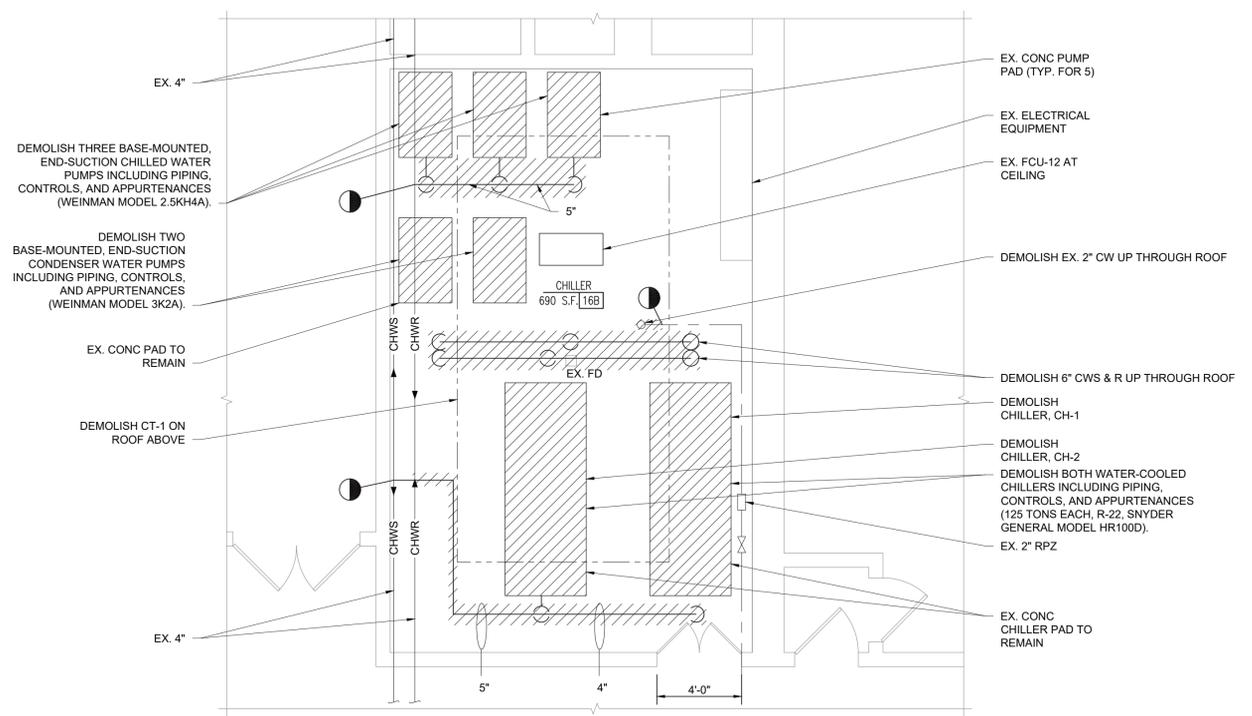
Drawn by: MEP  
Checked by: PV  
Project No.: 42054  
Scale: AS NOTED  
Date: 09-14-23

REC. EXP. DATE: 04-30-24

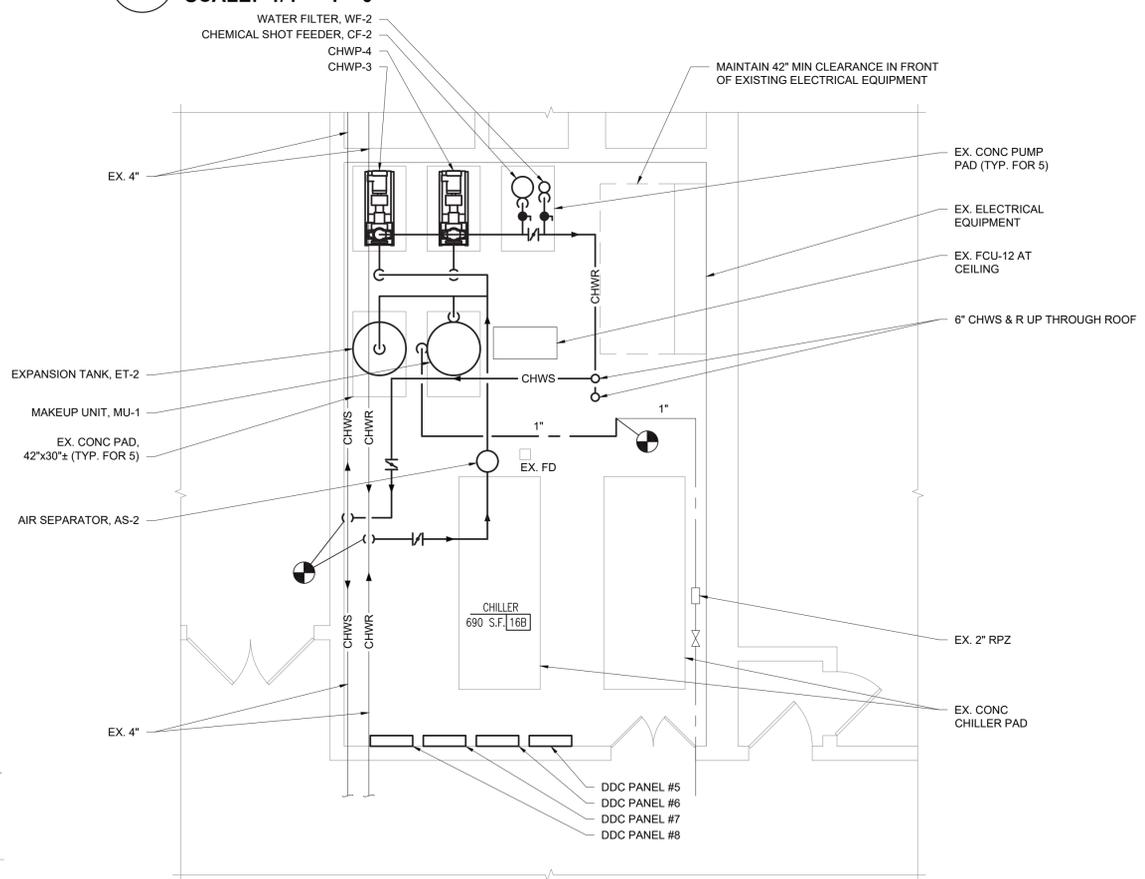
No.	Date	Revisions
3	09-14-23	BIDDING DOCUMENTS
2	06-09-23	SED ADDENDUM # 1
1	12-28-22	BIDDING DOCUMENTS



**1 CHILLER ROOM ENLARGED PLAN**  
SCALE: 1/4" = 1' - 0"



**2 CHILLER ROOM ENLARGED PLAN DEMOLITION**  
SCALE: 1/4" = 1' - 0"



**3 CHILLER ROOM ENLARGED PLAN - INSTALLATION**  
SCALE: 1/4" = 1' - 0"

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

REC. EXP. DATE: 04-30-24

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	AS NOTED
Date	09-14-23

**GREENMAN PEDERSEN, INC**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SUDBURY, NY 10861

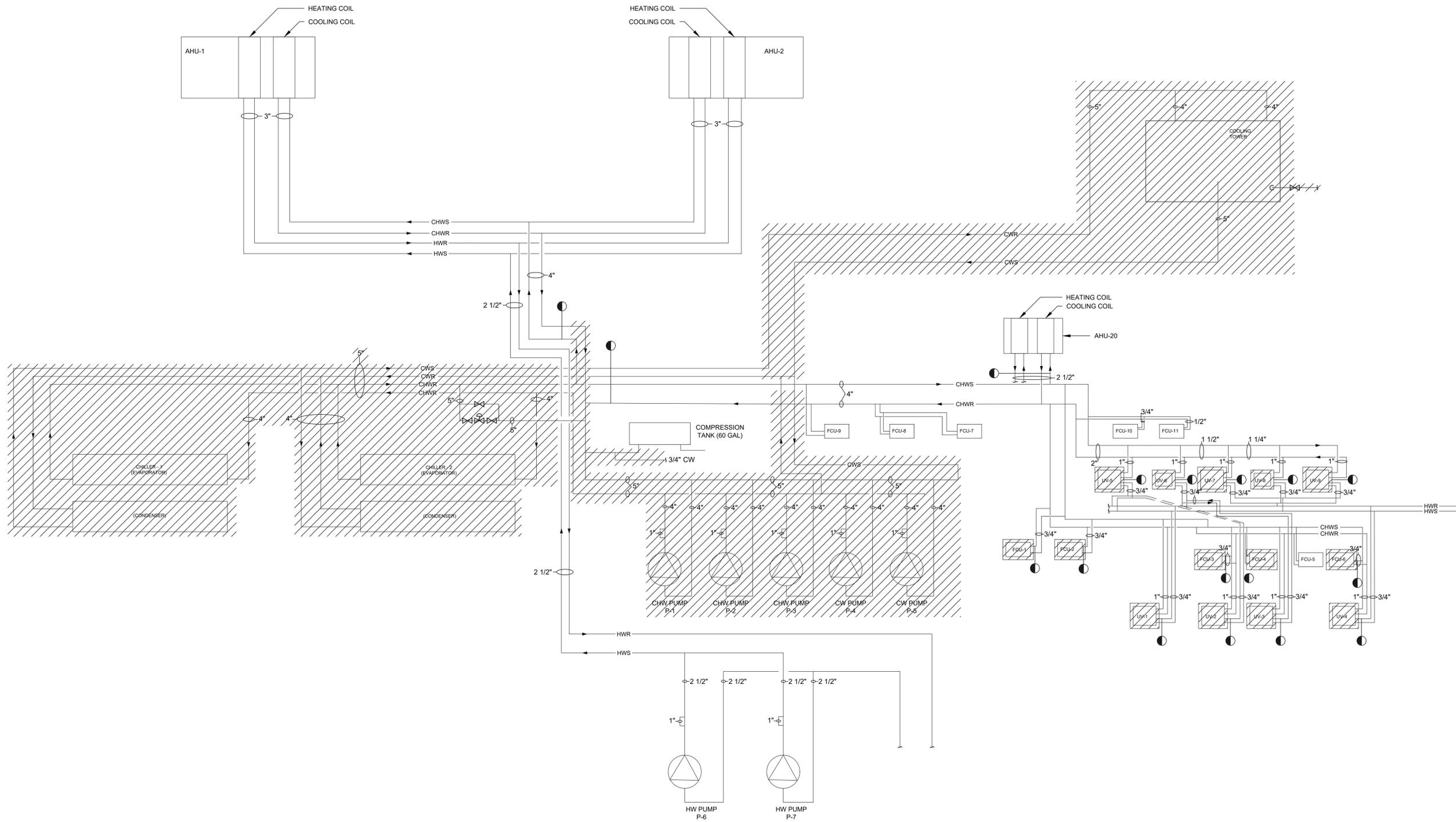
Mechanical Electrical Engineer:  
Structural Engineer:

UNIVENT REPLACEMENT AT  
WILLOW GROVE  
ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
145 PINE ST  
TERRILL, NY 10984  
COUNTY OF ROCKLAND

**HSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New York, NY 10056 Tel 845-798-9200  
www.hsaarch.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title: **MECHANICAL ENLARGED INSTALLATION PLANS**  
Drawing No.: **WGES-M-201**





**1 CHILLED WATER SYSTEM PIPING DIAGRAM - ORIGINAL BUILDING - DEMOLITION**  
 SCALE: N.T.S.

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

REC. EXP. DATE: 04-30-24

Drawn by NY  
 Checked by MIP  
 Project No. 42054  
 Scale NTS  
 Date 09-14-23

**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10961  
 Mechanical Electrical Engineer

**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10961  
 Structural Engineer

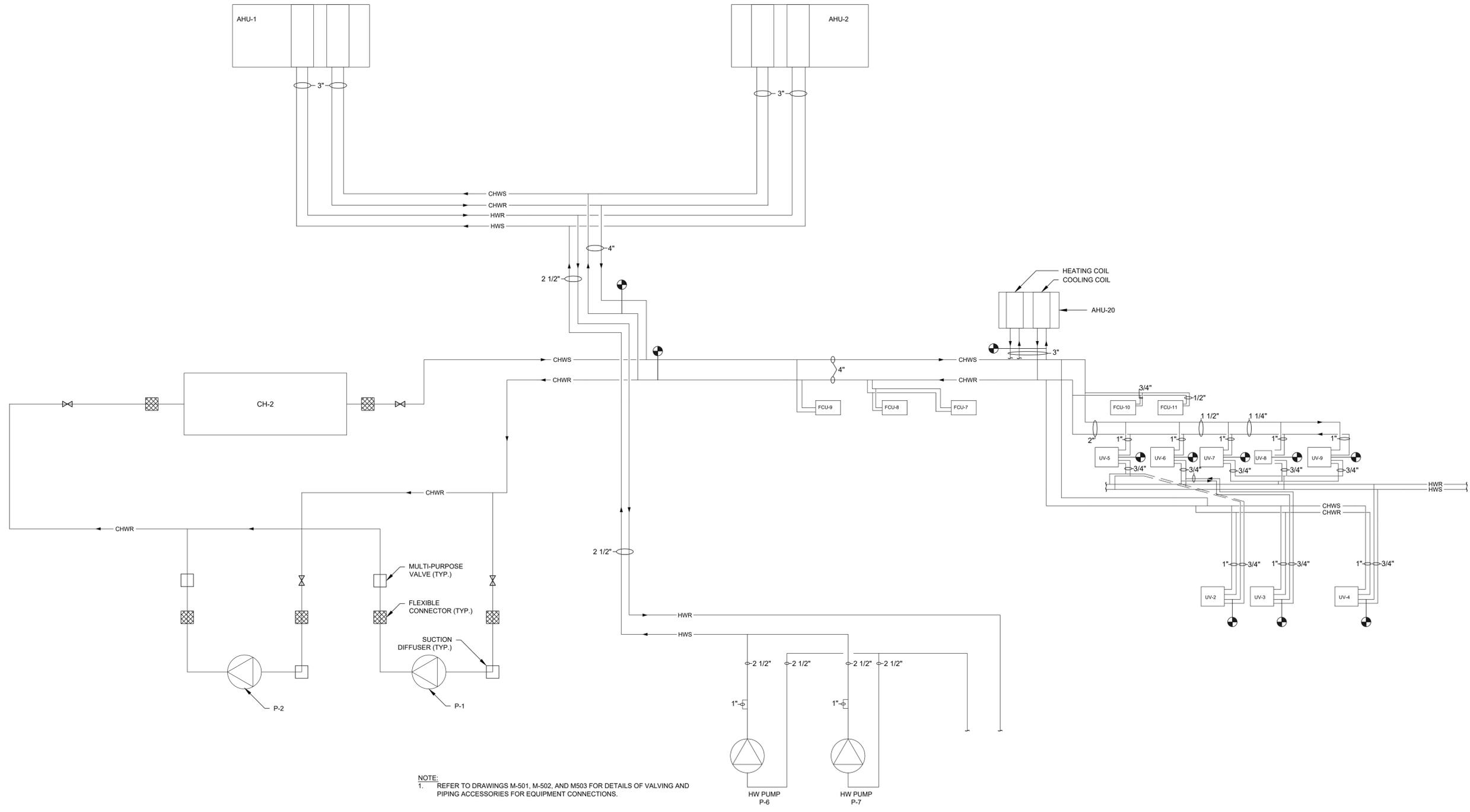
**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
 SED# 50-02-01-06-0-030-016  
 COUNTY OF ROCKLAND  
 145 PINE ST  
 TIBOLA, NY 10984

**MSA**  
**MICHAEL SHILALE ARCHITECTS, L.L.P.**  
 140 Park Avenue New City, NY 10956 Tel 845-708-9200  
 www.msaarch.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.

Drawing Title  
**HVAC PIPING DIAGRAM - DEMOLITION**

Drawing No.  
**WGES-M-301**



NOTE:  
 1. REFER TO DRAWINGS M-501, M-502, AND M503 FOR DETAILS OF VALVING AND PIPING ACCESSORIES FOR EQUIPMENT CONNECTIONS.

**1 CHILLED WATER SYSTEM PIPING DIAGRAM - ORIGINAL BUILDING - INSTALLATION**  
 SCALE: N.T.S.

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

REC. EXP. DATE: 04-30-24

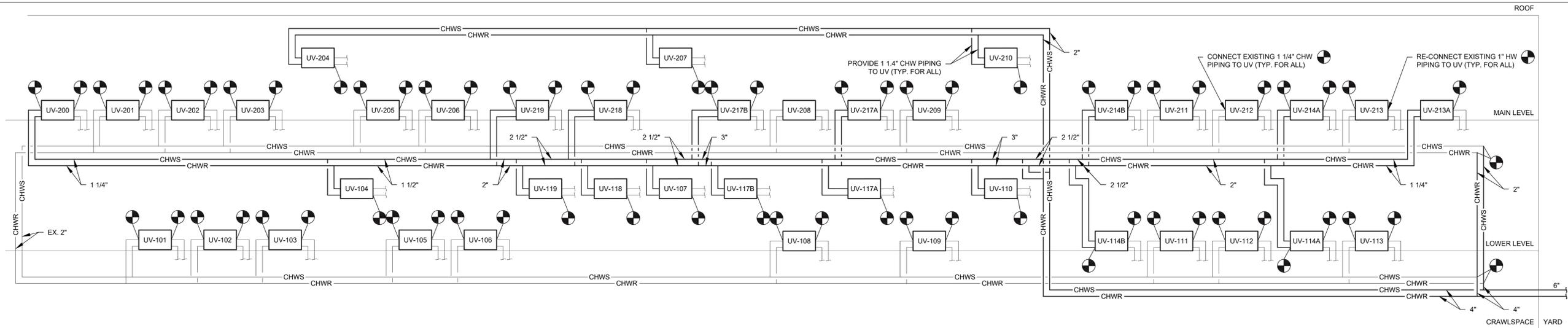
Drawn by	NY
Checked by	MP
Project No.	42054
Scale	NTS
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201 Mechanical Electrical Engineer	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201 Structural Engineer
---	--

UNIVENT REPLACEMENT AT  
 WILLOW GROVE  
 ELEMENTARY SCHOOL  
 SED# 50-02-01-06-0-030-016  
 145 POND RD  
 TIERMUN, NY 10984  
 COUNTY OF ROCKLAND

**MSA**  
 MICHAEL SHILALE ARCHITECTS, LLP  
 140 Park Avenue New City, NY 10956 Tel 845-708-9200  
 www.shilale.com

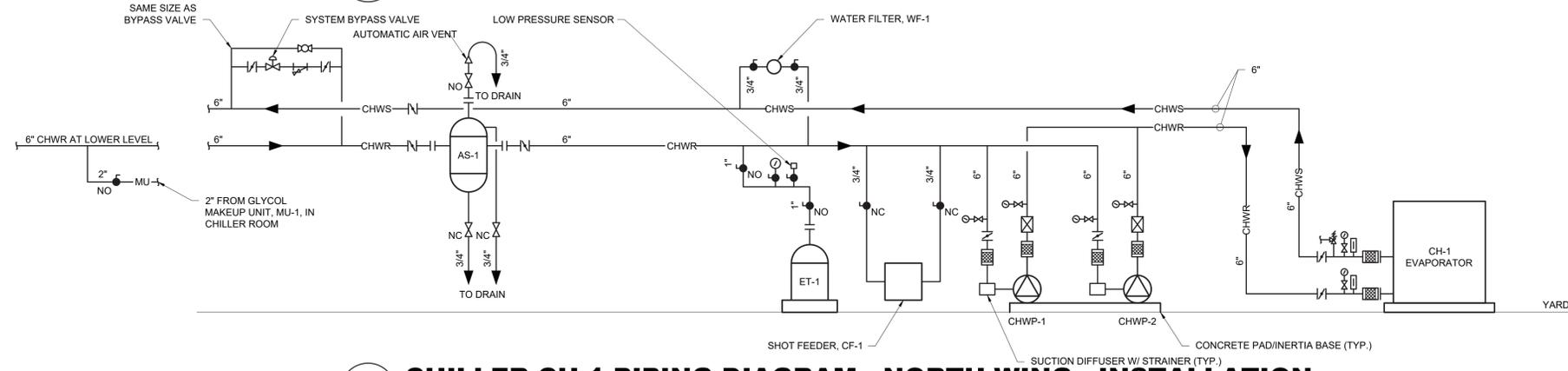
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
 Drawing Title  
**HVAC PIPING DIAGRAM - INSTALLATION**  
 Drawing No.  
**WGES-M-302**



- NOTES:
- CONDENSATE DRAIN AND SOME HOT WATER PIPING ARE NOT SHOWN FOR CLARITY. REFER TO THE PLANS FOR THE COMPLETE LAYOUT.
  - THE MINIMUM SIZE FOR CHILLED WATER PIPING IS 1 1/4". REFER TO THE PIPE SIZING SCHEDULES FOR ALL OTHER SIZES NOT SPECIFICALLY SHOWN HERE. VERIFY IN FIELD ALL SIZES FOR EXISTING PIPING PRIOR TO FABRICATION.
  - FOR VALVES AND ACCESSORIES AT UNIT VENTILATORS, SEE DETAILS ON M-503.

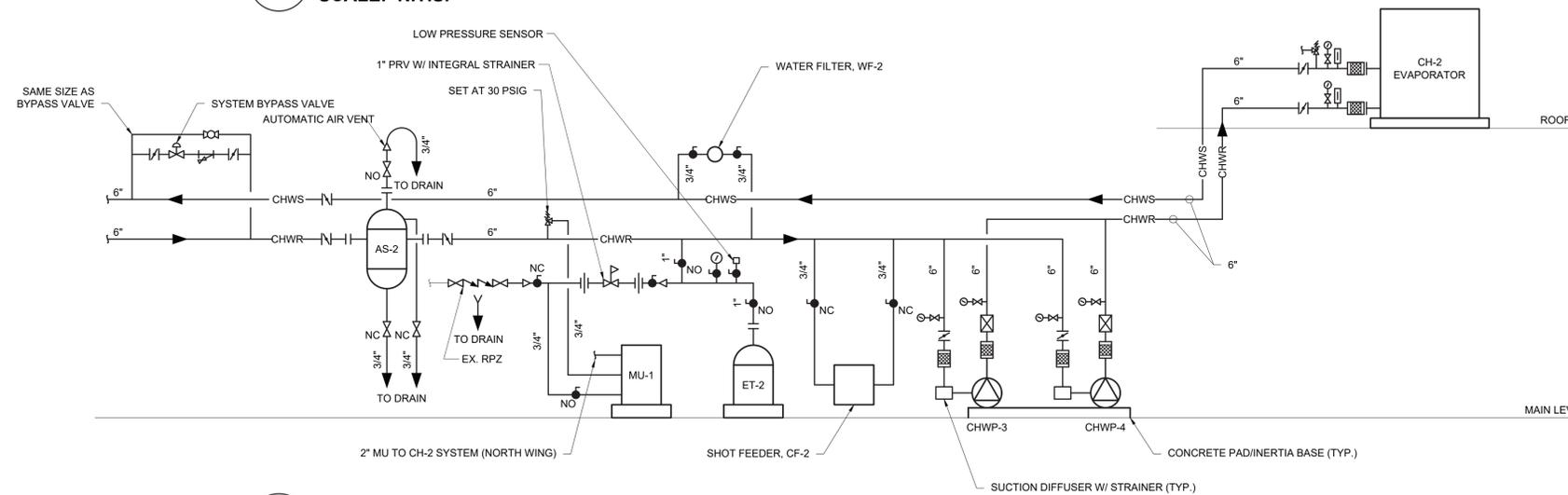
## 1 CHILLED WATER SYSTEM PIPING DIAGRAM - NORTH WING - INSTALLATION

SCALE: N.T.S.



## 2 CHILLER CH-1 PIPING DIAGRAM - NORTH WING - INSTALLATION

SCALE: N.T.S.



## 3 CHILLER CH-2 PIPING DIAGRAM - INSTALLATION

SCALE: N.T.S.

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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
 Checked by: PV  
 Project No.: 42054  
 Scale: NTS  
 Date: 09-14-23

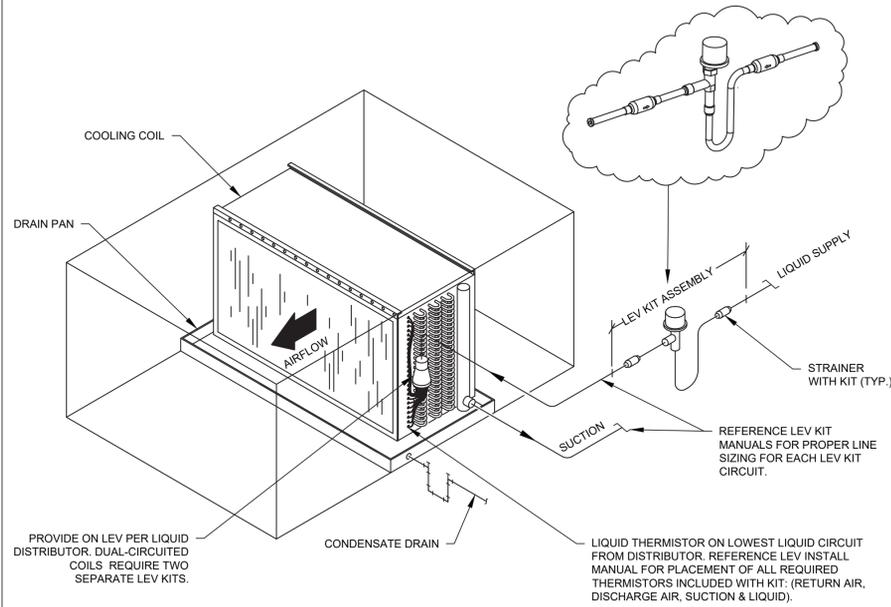
**GREENMAN PEDERSEN, INC.**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10961  
 Mechanical Electrical Engineer

**GREENMAN PEDERSEN, INC.**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10961  
 Structural Engineer

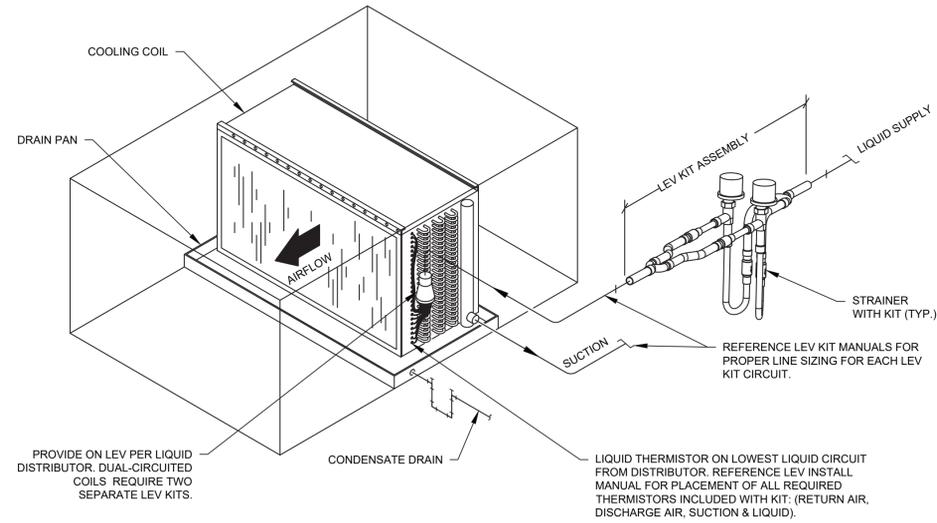
UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL  
 SED# 50-02-01-06-0-030-016  
 145 POND DR. TIBOLA, NY 10984  
 COUNTY OF ROCKLAND

**MSA**  
 MICHAEL SHILALE ARCHITECTS, LLP  
 140 Park Avenue New City, NY 10956 Tel 845-708-9200  
 www.shilale.com

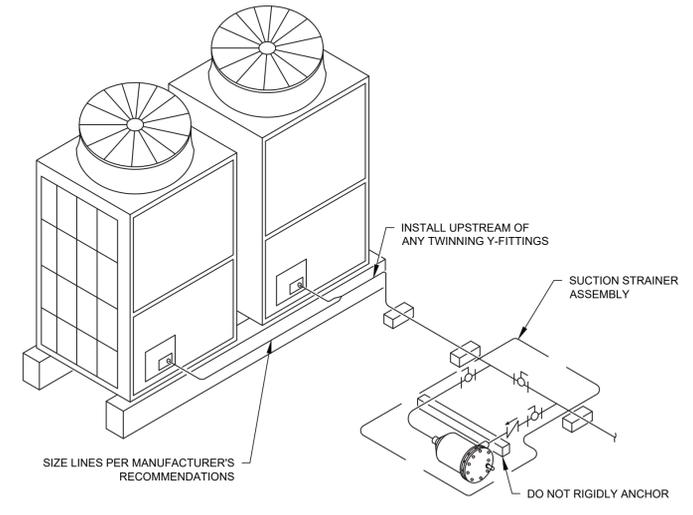
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
 Drawing Title: CHILLER PIPING DIAGRAMS  
 Drawing No.: **WGES-M-303**



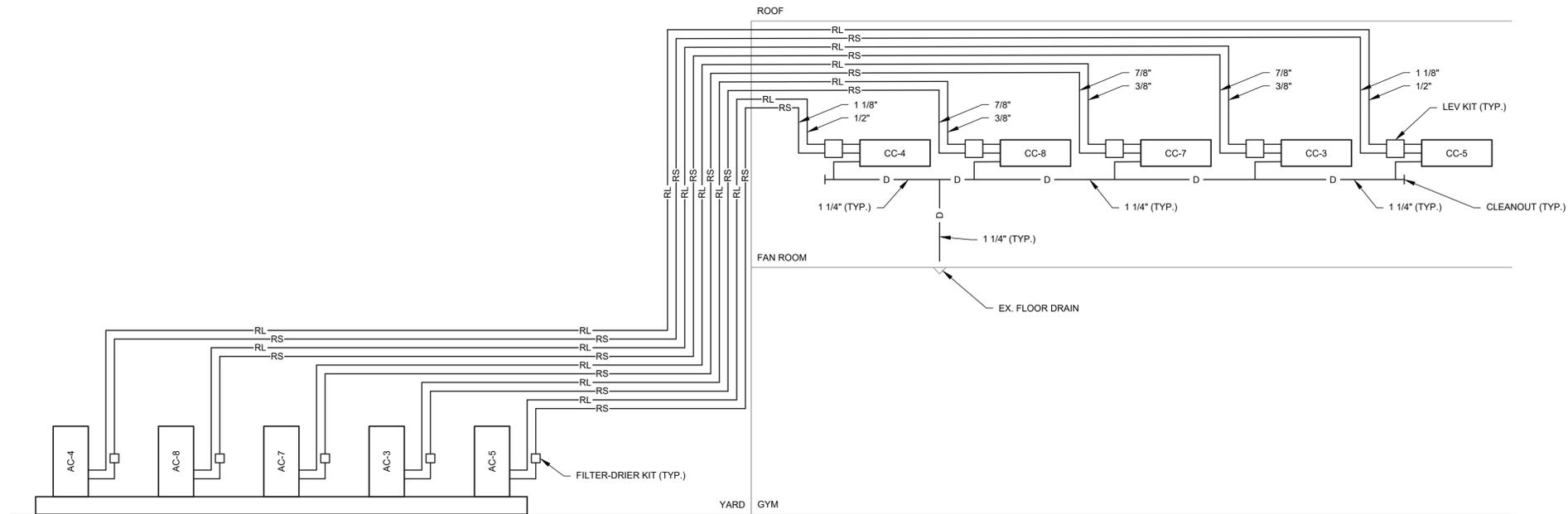
**2 DX COOLING COIL PIPING - CC-3, CC-7, AND CC-8**  
SCALE: N.T.S.



**3 DX COOLING COIL PIPING - CC-4 & CC-5**  
SCALE: N.T.S.



**4 PIPING AT AC-3, AC-4, AC-5, AC-7, & AC-8**  
SCALE: N.T.S.



- NOTE:
- 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.
  - 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.

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

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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
Checked by: PV  
Project No.: 42054  
Scale: NTS  
Date: 09-14-23

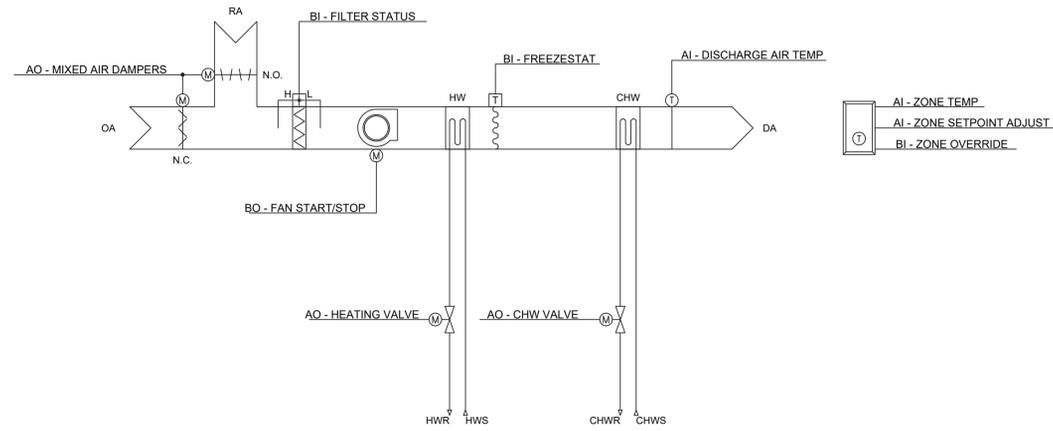
**GREENMAN PEDERSEN, INC.**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SYRACUSE, NY 13201  
Mechanical Electrical Engineer

**GREENMAN PEDERSEN, INC.**  
2 EXECUTIVE BOULEVARD  
SUITE 200  
SYRACUSE, NY 13201  
Structural Engineer

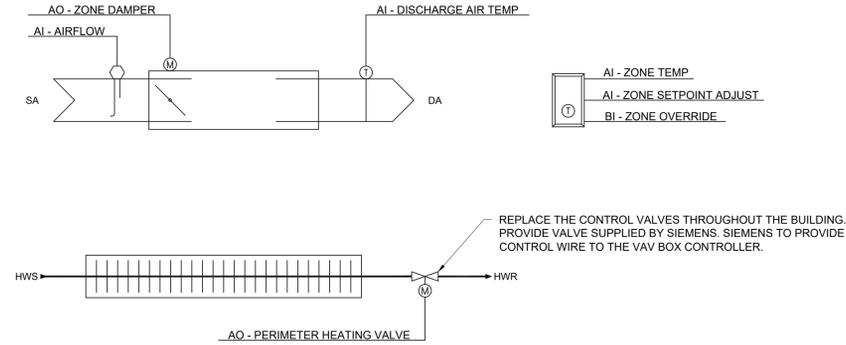
UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
145 BRIDGE ST. TROY, NY 12084  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, LLP  
140 Park Avenue New City, NY 10956 Tel 845-708-9200  
www.shilale.com

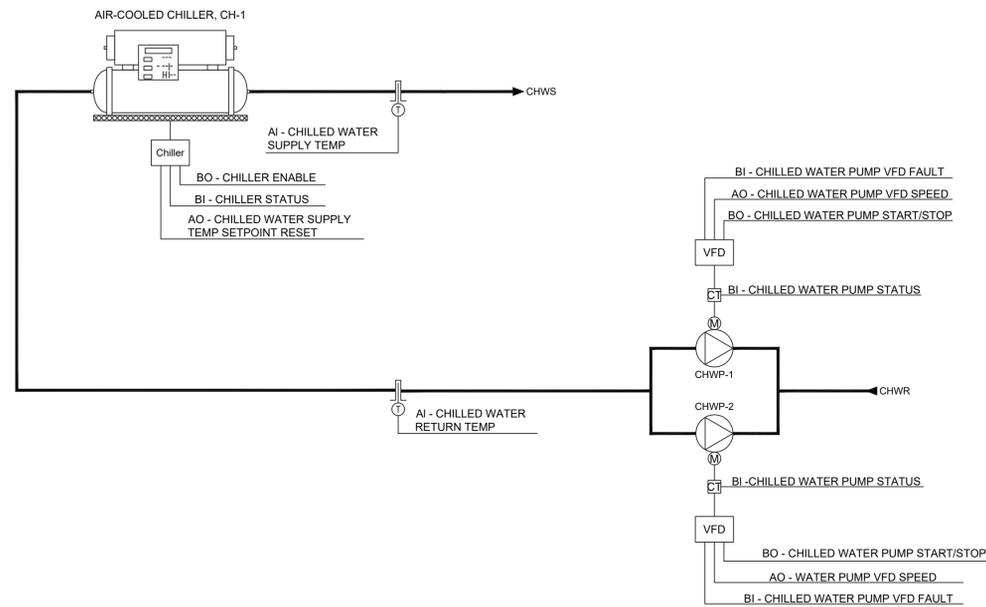
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.  
Drawing Title: REFRIGERANT PIPING DIAGRAMS  
Drawing No.: **WGEM-M-304**



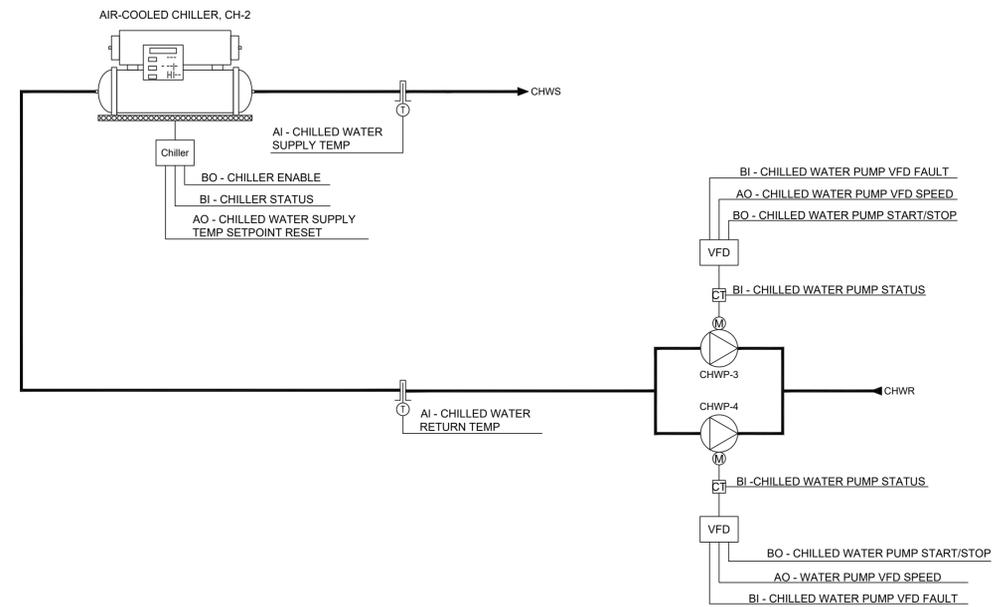
**1 UNIT VENTILATOR CONTROL DIAGRAM**  
SCALE: NONE



**2 VAV TERMINAL CONTROL DIAGRAM**  
SCALE: NONE



**3 CHILLER CONTROL DIAGRAM (CH-1)**  
SCALE: NONE



**4 CHILLER CONTROL DIAGRAM (CH-2)**  
SCALE: NONE

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

REC. EXP. DATE: 04-30-24

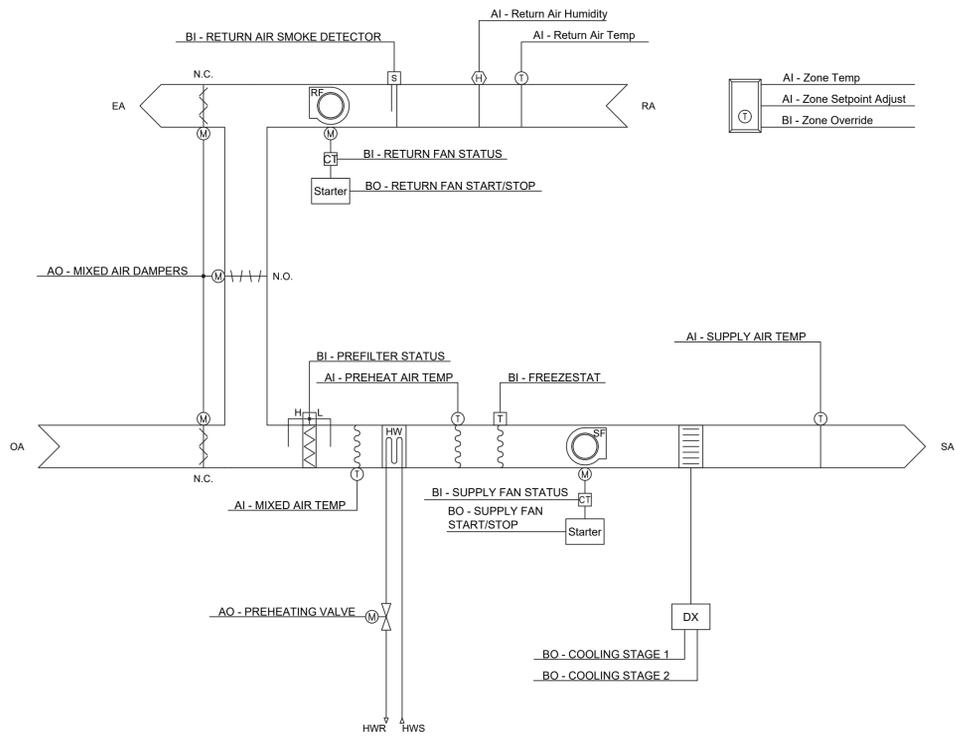
Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23

Mechanical Electrical Engineer:	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201
Structural Engineer:	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 200 SYRACUSE, NY 13201

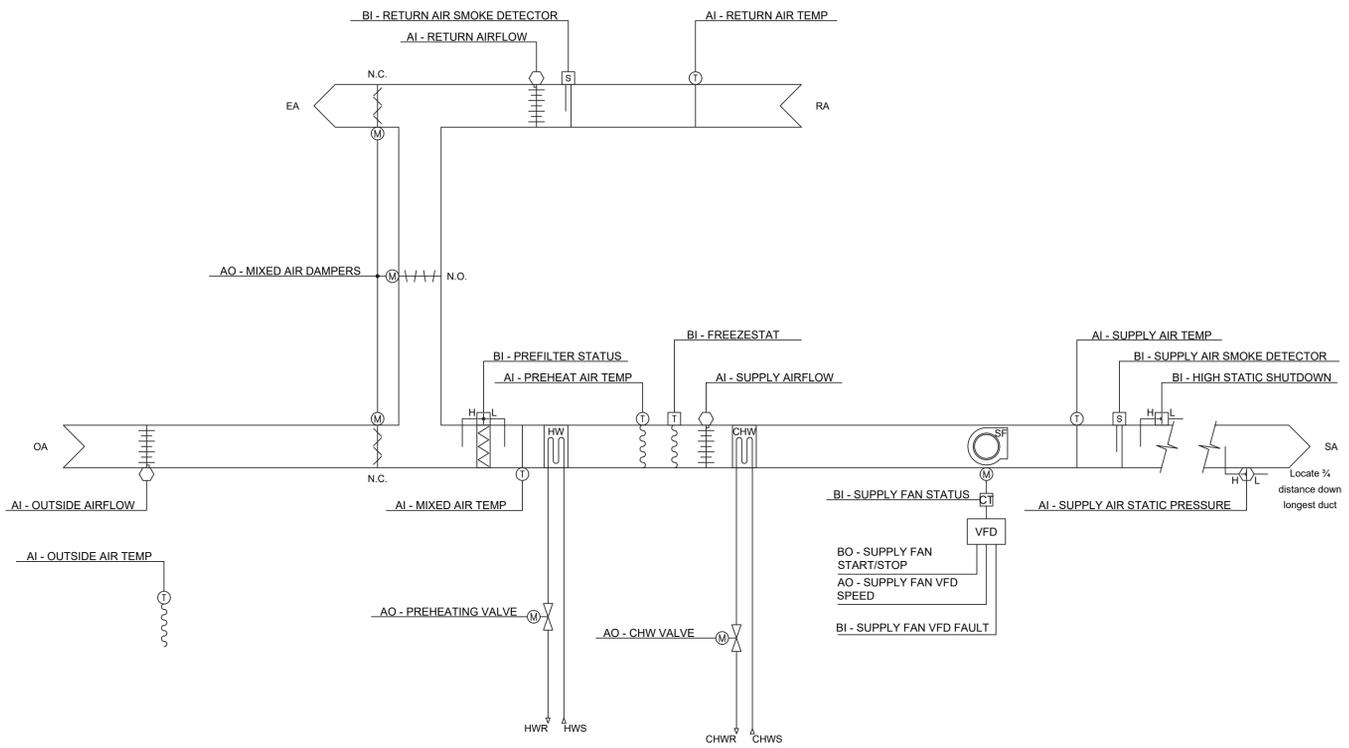
UNIVENT REPLACEMENT  
AT  
WILLOW GROVE  
ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
140 PARK AVENUE NEW CITY, NY 10956  
TEL 845-708-9200  
WWW.GSA.COM  
TOWN OF  
TOWN OF  
COUNTY OF ROCKLAND



© COPYRIGHT, MICHAEL SHILAIE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title  
**CONTROL DIAGRAMS - 1**  
Drawing No.  
**WGES-M-401**



**1 AIR HANDLING UNIT CONTROL DIAGRAM - DX COOLING**  
SCALE: NONE



**2 AIR HANDLING UNIT CONTROL DIAGRAM - CHW COOLING**  
SCALE: NONE

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

REC. EXP. DATE: 04-30-24

Drawn by: MEP  
 Checked by: PV  
 Project No.: 42054  
 Scale: NTS  
 Date: 09-14-23

**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10864  
 Mechanical Electrical Engineer

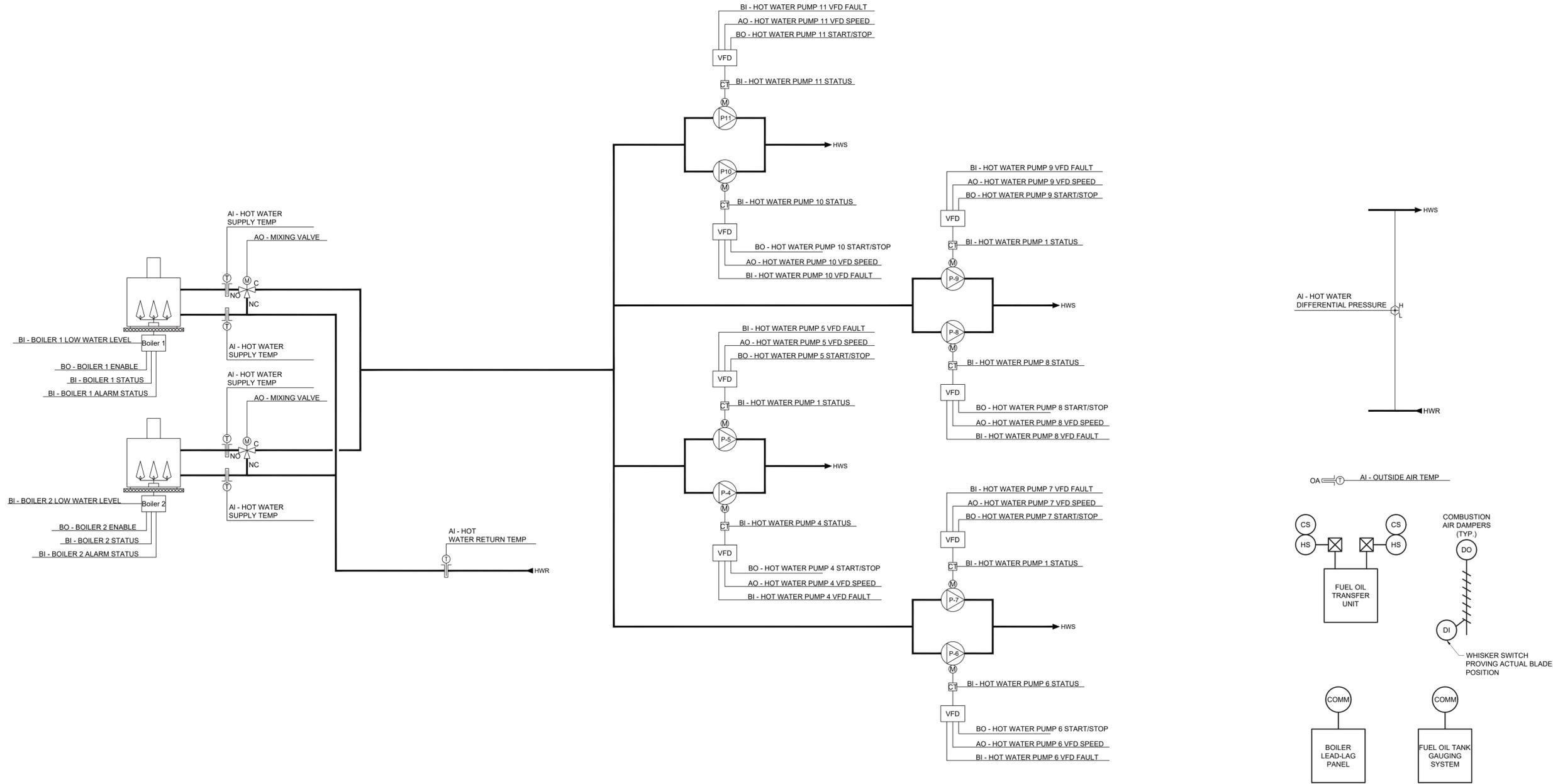
**GREENMAN PEDERSEN, INC**  
 2 EXECUTIVE BOULEVARD  
 SUITE 200  
 SUDBURY, NY 10864  
 Structural Engineer

**UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL**  
 SED# 50-02-01-06-0-030-016  
 140 Park Avenue New City, NY 10956 Tel 845-708-9200  
 www.univent.com  
 COUNTY OF ROCKLAND

**MSA**  
 MICHAEL SHILALE ARCHITECTS, LLP  
 140 Park Avenue New City, NY 10956 Tel 845-708-9200  
 www.shilale.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
 Drawing Title: **CONTROL DIAGRAMS - 2**

Drawing No.: **WGES-M-402**



**1 HOT WATER BOILER SYSTEM CONTROL SCHEMATIC**  
SCALE: NTS

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

REC. EXP. DATE: 04-30-24

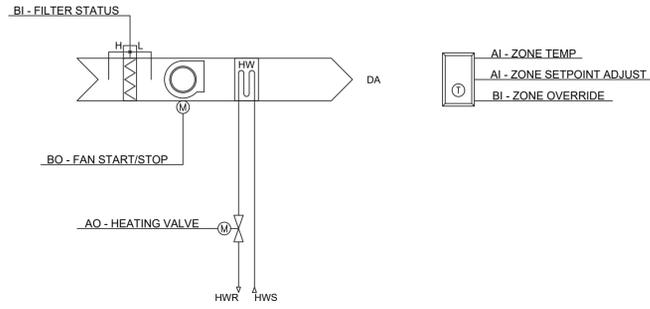
Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861
Mechanical Electrical Engineer	Structural Engineer

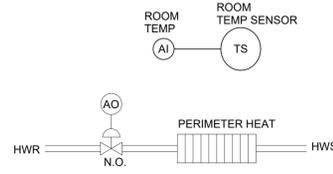
UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
COUNTY OF ROCKLAND  
145 POND RD  
TIBOLA, NY 10984



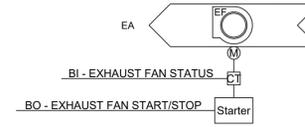
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.
Drawing Title <b>CONTROL DIAGRAMS - 3</b>
Drawing No. <b>WGES-M-403</b>



**1 CABINET HEATER CONTROL DIAGRAM**  
SCALE: NONE



**2 RADIATOR CONTROL DIAGRAM**  
SCALE: NONE

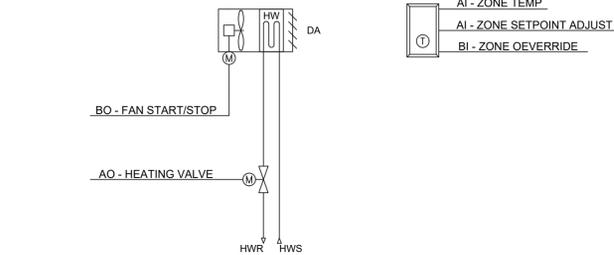


**3 EXHAUST FAN CONTROL DIAGRAM**  
SCALE: NONE

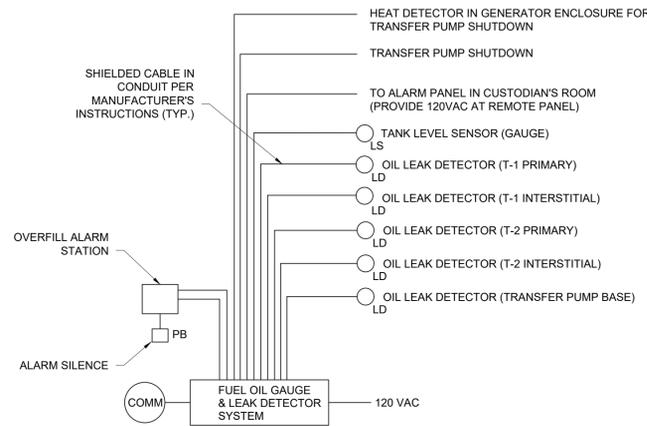
THE FOLLOWING LIST IS PROVIDED FOR REFERENCE ONLY TO INDICATE WHICH MAJOR EQUIPMENT IS CONTROLLED BY EACH PANEL, AND MAY NOT BE A COMPLETE LIST OF ALL EQUIPMENT. DEVICES NOT SPECIFICALLY LISTED HERE SUCH AS UNIT VENTILATORS, RADIATORS, FAN COIL UNITS, CABINET HEATERS, UNIT HEATERS, EXHAUST FANS, AIR CONDITIONING UNITS, AND OTHER EQUIPMENT SHALL BE CONNECTED TO THE NEAREST PANELS.

1. DDC PANEL #1
  - 1.1. CH-1
  - 1.2. CHWP-1
  - 1.3. CHWP-2
  - 1.4. CABINET HEATERS
  - 1.5. UNIT VENTILATORS
2. DDC PANEL #2
  - 2.1. AHU-1
3. DDC PANEL #3
  - 3.1. CABINET HEATERS
  - 3.2. UNIT VENTILATORS
4. DDC PANEL #4
  - 4.1. AHU-20
  - 4.2. FAN COIL UNITS
  - 4.3. UNIT VENTILATORS
5. DDC PANEL #5
  - 5.1. AHU-1
  - 5.2. EF-1
  - 5.3. VAV TERMINALS
  - 5.4. RADIATORS
6. DDC PANEL #6
  - 6.1. CH-2
  - 6.2. CHWP-3
  - 6.3. CHWP-4
7. DDC PANEL #7
  - 7.1. BOILER ROOM EQUIPMENT
8. DDC PANEL #8
  - 8.1. AHU-2
  - 8.2. EF-2
  - 8.3. AHU-CAFE
  - 8.4. VAV TERMINALS
  - 8.5. RADIATORS
9. DDC PANEL #9
  - 9.1. AHU-2
10. DDC PANEL #10
  - 10.1. AHU-6
11. DDC PANEL #11
  - 11.1. AHU-3
  - 11.2. AC-3
12. DDC PANEL #12
  - 12.1. AHU-4
  - 12.2. AC-4
13. DDC PANEL #13
  - 13.1. AHU-5
  - 13.2. AC-5
14. DDC PANEL #14
  - 14.1. AHU-7
  - 14.2. AC-7
15. DDC PANEL #15
  - 15.1. AHU-8
  - 15.2. AC-8

**6 DDC CONTROL PANEL DESIGNATIONS**  
SCALE: NONE

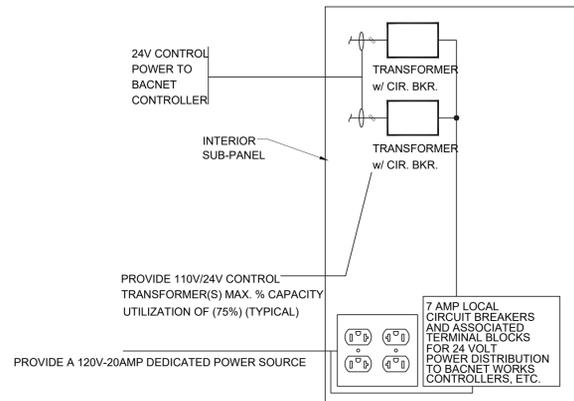


**4 UNIT HEATER CONTROL DIAGRAM**  
SCALE: NONE



NOTE:  
1. VERIFY CABLE SIZES AND QUANTITIES WITH EQUIPMENT MANUFACTURERS.

**5 FUEL OIL TANK GAUGING SYSTEM**  
SCALE: NONE



- 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.

**7 DDC CONTROL PANEL INSTALLATION**  
SCALE: NONE

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

REC. EXP. DATE: 04-30-24

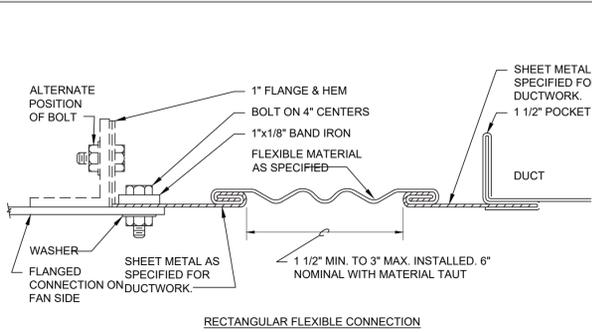
Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10864	<b>GREENMAN PEDERSEN, INC</b> 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10864
Mechanical Structural Engineer	Structural Engineer

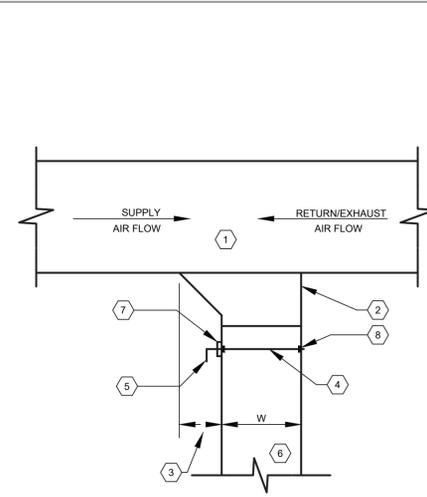
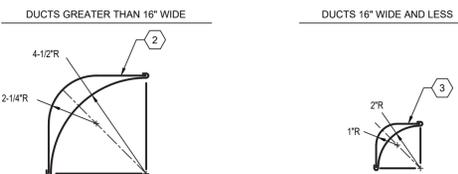
UNIVENT REPLACEMENT  
AT  
WILLOW GROVE  
ELEMENTARY SCHOOL  
SED# 50-02-01-06-0-030-016  
145 POND DR  
TIBOLA, NY 10984  
COUNTY OF ROCKLAND

**MSA**  
MICHAEL SHILALE ARCHITECTS, LLP  
140 Park Avenue New City, NY 10956 Tel 845-708-9200  
www.shilale.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED. Drawing Title <b>CONTROL DIAGRAMS -</b> <b>4</b>	Drawing No. <b>WGES-M-404</b>
---	----------------------------------



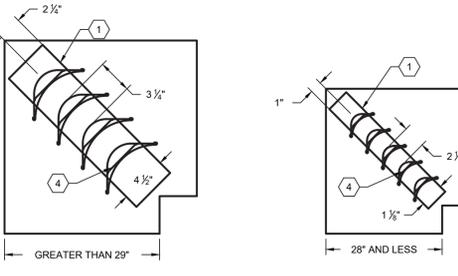
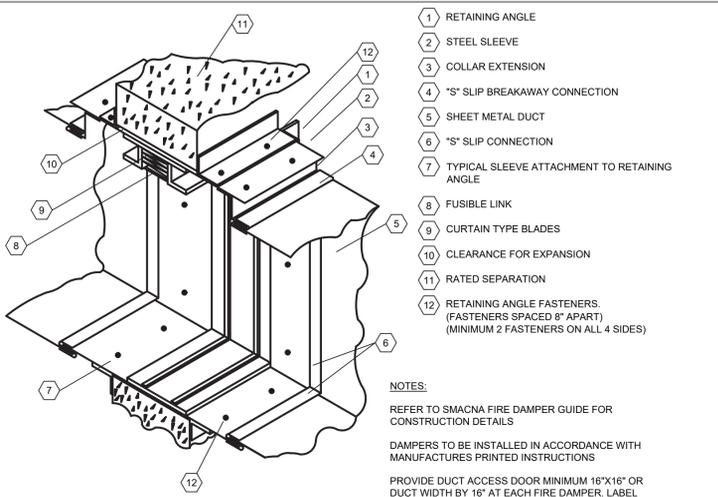
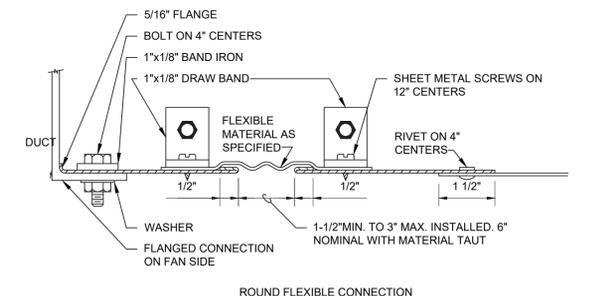
- 1 22 GA VANE RUNNER BOLTED, SCREWED OR WELDED TO DUCT
- 2 LARGE DOUBLE VANE, MIN 24 GA, 72" MAX UNSUPPORTED VANE LENGTH
- 3 SMALL DOUBLE VANE, MIN 26 GA, 48" MAX UNSUPPORTED VANE LENGTH
- 4 TURNING VANE MOUNTED ON EACH TAB OF RUNNER. EVERY RUNNER TAB MUST RECEIVE A TURNING VANE.



- 1 RECTANGULAR MAIN DUCT
- 2 45 DEG. TAKEOFF
- 3 1/4 W. 5" MINIMUM
- 4 VOLUME DAMPER
- 5 LOCKING QUADRANT
- 6 RECTANGULAR BRANCH DUCT
- 7 PROVIDE HAT CHANNEL ON INSULATED DUCTWORK
- 8 BEARING (TYP.)

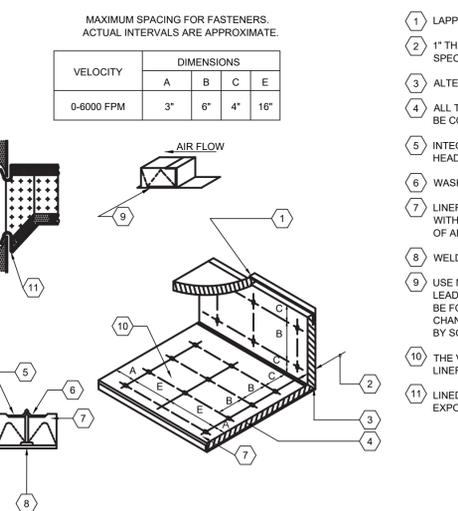
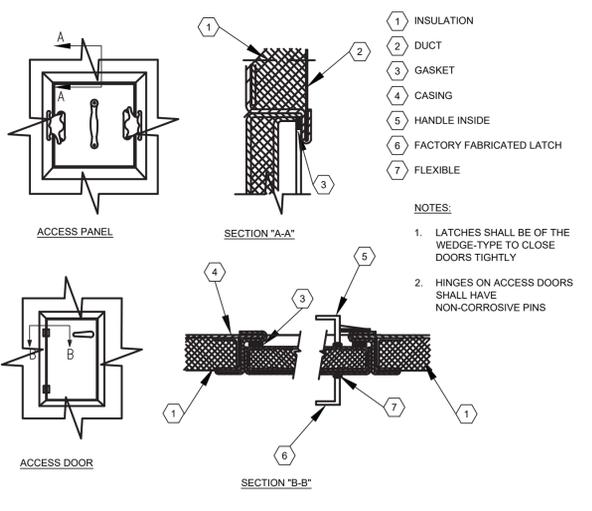
**GENERAL NOTES:**  
 SINGLE-BLADE DAMPER SHAFT SHALL BE CONTINUOUS.  
 CONTRACTOR FABRICATED DAMPERS ARE NOT ACCEPTABLE ABOVE 11" IN HEIGHT.  
 SINGLE BLADE DAMPERS ARE NOT ACCEPTABLE FOR DUCTS OVER 11" IN HEIGHT. USE MANUFACTURED OPPOSED BLADE DAMPERS.  
 PROVIDE BEARINGS AT BOTH ENDS OF DAMPER BLADES WITH GASKETS AT DUCT PENETRATIONS

### 3 RECTANGULAR DUCT TAP SCALE: NTS



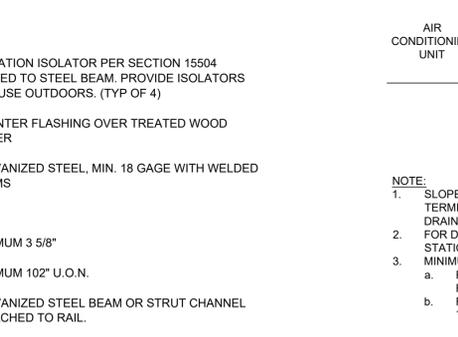
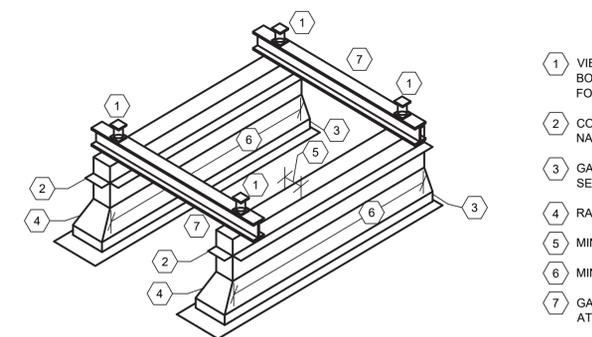
### 1 DUCT FLEXIBLE CONNECTION SCALE: NTS

### 2 SQUARE DUCT ELBOW SCALE: NTS



### 5 DUCT ACCESS DOOR SCALE: NTS

### 6 DUCT LINER INSTALLATION SCALE: NTS

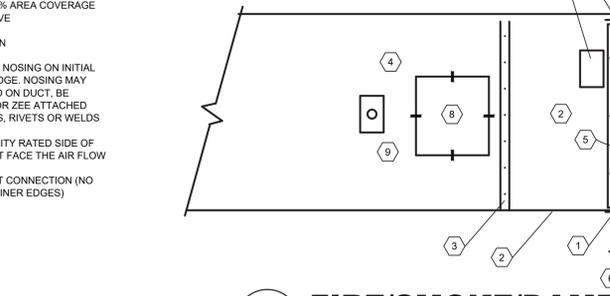


### 9 ROOFTOP EQUIPMENT MOUNTING DETAIL SCALE: NTS

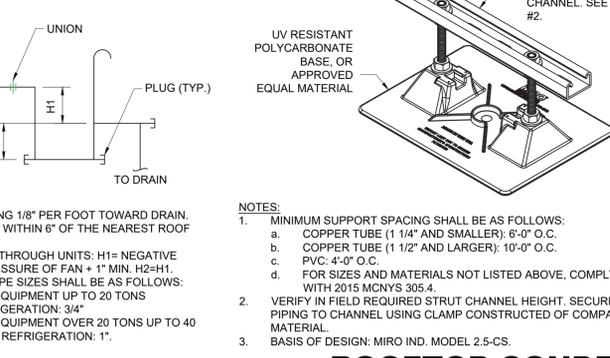
### 10 CONDENSATE DRAIN TRAP SCALE: NTS

### 4 DUCT AT WALL PENETRATION SCALE: NTS

- 1 RETAINING ANGLE SECURED WITH SCREWS TO SLEEVE AND RATED PARTITION.
- 2 INTEGRAL STEEL SLEEVE, LENGTH COORDINATED WITH PARTITION DEPTH
- 3 BREAK AWAY CONNECTION SECURED WITH SCREWS
- 4 SHEET METAL DUCTWORK
- 5 FIRE/SMOKE DAMPER WITH FUSIBLE LINK & DAMPER LINKAGE
- 6 CLEARANCE FOR EXPANSION
- 7 RATED SEPARATION
- 8 ACCESS DOOR TO ACCESS FIRE DAMPER & SMOKE DETECTOR SAMPLING TUBE (PROVIDE ADDITIONAL DOOR IF NECESSARY)
- 9 SMOKE DETECTOR W/SAMPLING TUBE. MC TO INSTALL ASSEMBLY
- 10 DAMPER ACTUATOR MOUNTED ON OUTSIDE OF DUCT



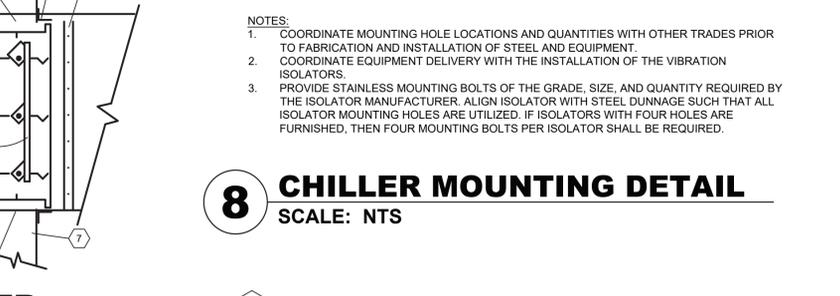
### 7 FIRE/SMOKE/DAMPER SCALE: NTS



### 11 ROOFTOP CONDENSATE PIPE SUPPORT SCALE: NTS

### 8 CHILLER MOUNTING DETAIL SCALE: NTS

- 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



### 12 ROOFTOP PIPE PENETRATION SCALE: NTS

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

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23
REC. EXP. DATE: 04-30-24	

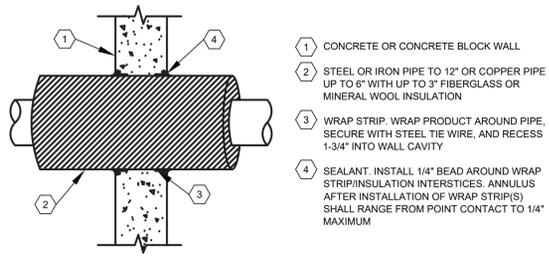
GREENMAN PEDERSEN, INC Mechanical Electrical Engineer	GREENMAN PEDERSEN, INC Structural Engineer
--	---

UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY  
 SED# 50-02 SCH 001-0-030-016  
 COUNTY OF ROCKLAND

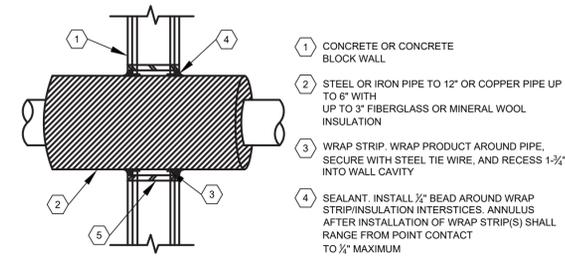
MSA  
 MICHAEL SHILALE ARCHITECTS, LLP  
 140 Park Avenue New York, NY 10066 Tel 845-708-9200  
 www.shilale.com

Mechanical Details  
 Drawing No. WGEM-M-501

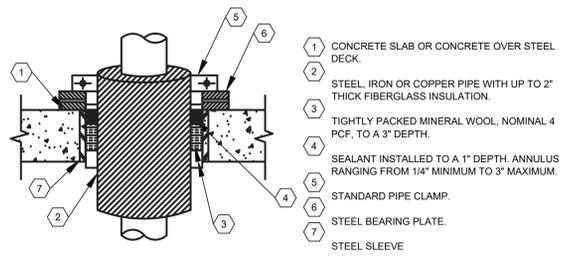
© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.



- 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



- 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 1/2" BEAD AROUND WRAP STRIP/INSULATION INTERSTICES. ANNULUS AFTER INSTALLATION OF WRAP STRIP(S) SHALL RANGE FROM POINT CONTACT TO 1/2" MAXIMUM
- 5 STEEL SLEEVE

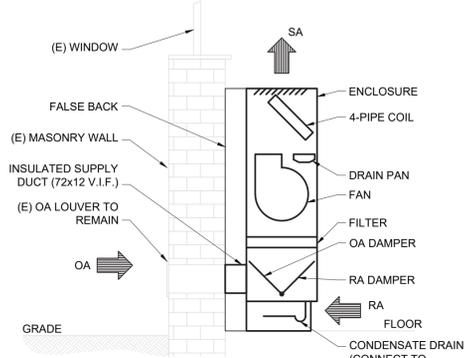


- 1 CONCRETE SLAB OR CONCRETE OVER STEEL DECK
- 2 STEEL, IRON OR COPPER PIPE WITH UP TO 2" THICK FIBERGLASS INSULATION
- 3 TIGHTLY PACKED MINERAL WOOL, NOMINAL 4 PCF, TO A 3" DEPTH
- 4 SEALANT INSTALLED TO A 1" DEPTH. ANNULUS RANGING FROM 1/4" MINIMUM TO 3" MAXIMUM
- 5 STANDARD PIPE CLAMP
- 6 STEEL BEARING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

**1 PIPE THRU MASONRY WALL**  
SCALE: N.T.S.

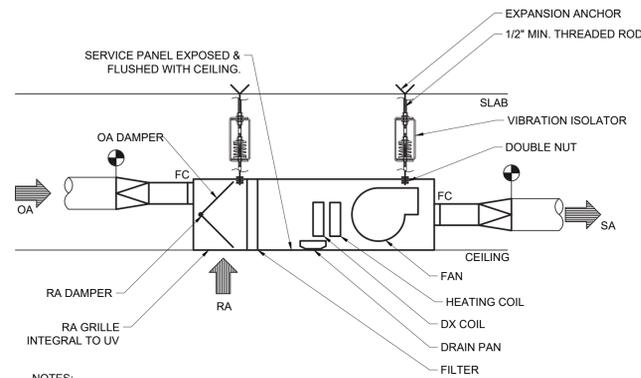
**2 PIPE THRU GWB WALL**  
SCALE: N.T.S.

**3 PIPE THRU FLOOR**  
SCALE: N.T.S.



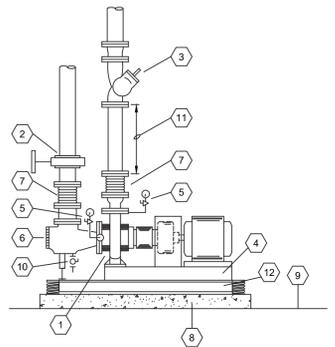
- NOTES:
- DEMOLITION: REMOVE THE EXISTING UNIT VENTILATOR WHERE SHOWN ON THE PLANS. THE EXISTING OUTSIDE AIR LOUVER AND WALL SLEEVE SHALL REMAIN.
  - CONSTRUCTION: PROVIDE THE UNIT VENTILATOR IN THE SAME LOCATION AS EXISTING WHERE SHOWN ON THE PLANS. CONNECT THE OUTSIDE AIR DUCT TO THE EXISTING OUTSIDE 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.

**4 VERTICAL UNIT VENTILATOR**  
SCALE: N.T.S.



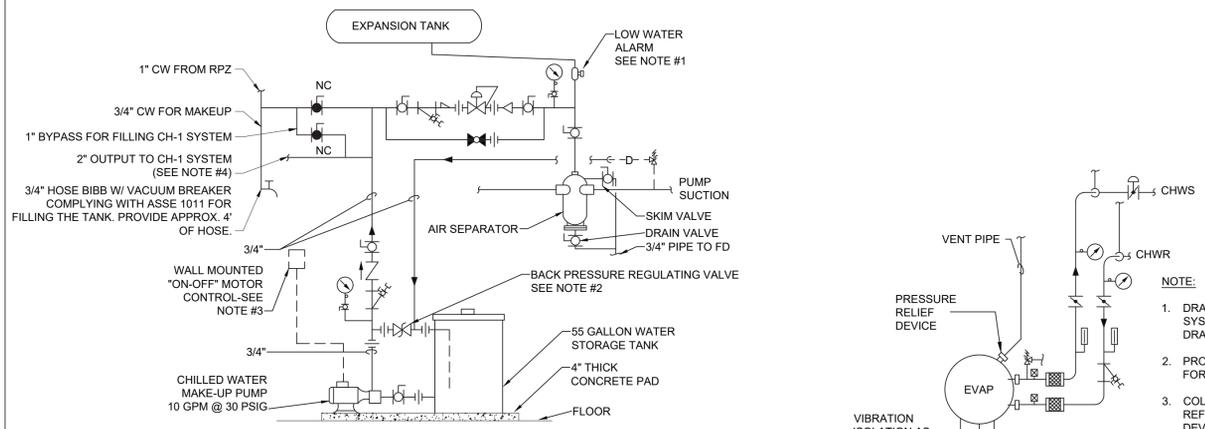
- NOTES:
- REFER TO THE UNIT VENTILATOR SCHEDULE ON FES-M-503 FOR FURTHER INFORMATION.

**5 HORIZONTAL UNIT VENTILATOR**  
SCALE: N.T.S.



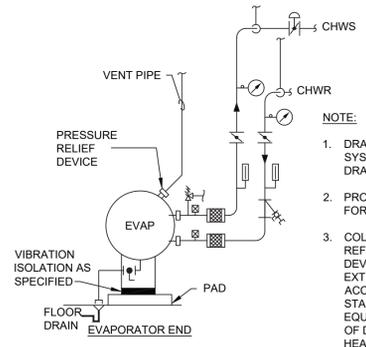
- 1 BASE MOUNTED PUMP
- 2 BUTTERFLY VALVE
- 3 TRIPLE DUTY VALVE
- 4 INFILL PUMP BASE WITH CONCRETE
- 5 PRESSURE GAUGE WITH NEEDLE VALVE
- 6 SUCTION DIFFUSER AND BASE LEG
- 7 FLEXIBLE CONNECTOR
- 8 6" CONCRETE BASE
- 9 FINISHED FLOOR
- 10 1" BALL VALVE
- 11 DISTANCE AS REQUIRED BY MFR.
- 12 CONCRETE FILLED INERTIA BASE (CHWP-3 & CHWP-4 ONLY).

**6 CHILLED WATER PUMP PIPING**  
SCALE: N.T.S.



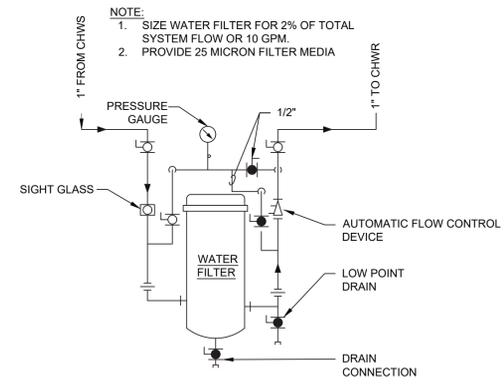
- NOTES:
- PROVIDE LOW WATER LEVEL ALARM. RELIEF VALVE DRAIN SHALL RETURN TO TANK AS SHOWN ON THIS DETAIL.
  - SET REGULATING VALVE TO MAINTAIN MAKE-UP PRESSURE AT 15 PSIG ABOVE HIGHEST SYSTEM PRV SETTING.
  - OPERATE PUMP MANUALLY AS REQUIRED TO FILL.
  - PROVIDE A GLYCOL MAKEUP UNIT WITH TWO SEPARATE PRV'S CAPABLE OF FEEDING TWO SEPARATE SYSTEMS.

**7 GLYCOL MAEKUP UNIT PIPING**  
SCALE: N.T.S.



- NOTE:
- DRAIN ALL LOW POINTS OF SYSTEMS TO NEAREST FLOOR DRAIN.
  - PROVIDE MARINE WATER BOXES FOR EVAPORATOR.
  - COLLECT VENT PIPES FROM ALL REFRIGERANT PRESSURE RELIEF DEVICES AND EXTEND TO EXTERIOR OF BUILDING IN ACCORDANCE WITH ASHRAE STANDARD 15. HEADER SIZE TO EQUAL OR EXCEED TOTAL AREA OF DEVICES CONNECTED TO THE HEADER.

**8 CHILLER PIPING CONNECTIONS**  
SCALE: N.T.S.



- NOTE:
- SIZE WATER FILTER FOR 2% OF TOTAL SYSTEM FLOW OR 10 GPM.
  - PROVIDE 25 MICRON FILTER MEDIA

**9 WATER FILTER PIPING**  
SCALE: N.T.S.

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

REC. EXP. DATE: 04-30-24

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23

<b>GREENMAN PEDERSEN, INC</b> Mechanical/Electrical Engineer 2 EXECUTIVE BOULEVARD SUITE 200 SUDBURY, NY 10901	<b>GREENMAN PEDERSEN, INC</b> Structural Engineer 2 EXECUTIVE BOULEVARD SUITE 200 SUDBURY, NY 10901
--	---

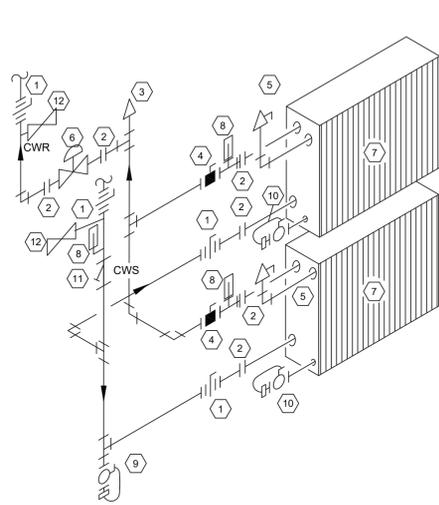
UNIVENT REPLACEMENT AT WILLOW GROVE ELEMENTARY  
 SED# 50-02 SCH 0010-030-016  
 COUNTY OF ROCKLAND



**MECHANICAL DETAILS**  
- 2

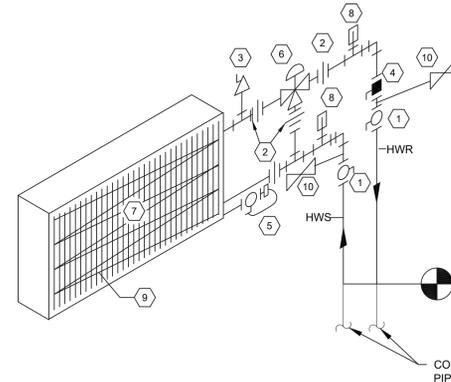
Drawing No. **WGES-M-502**

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS. ALL RIGHTS RESERVED.



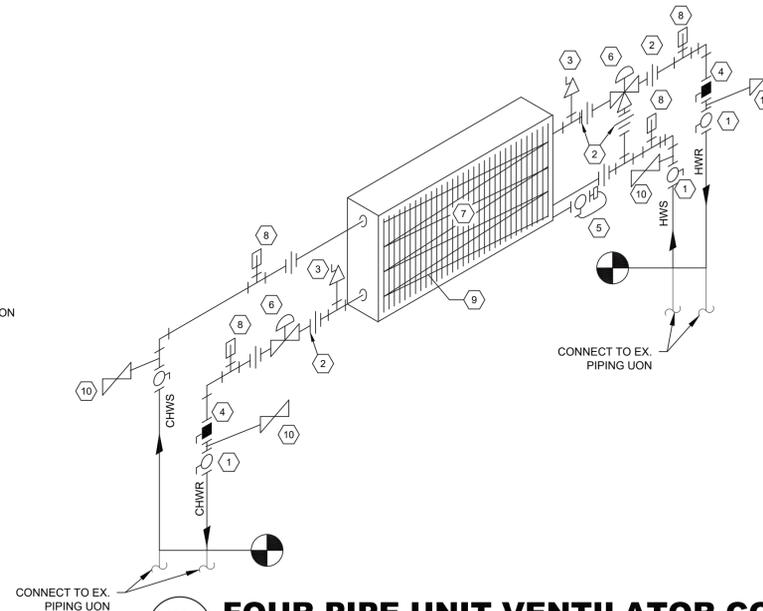
- 1 BUTTERFLY OR BALL VALVE (SEE SPECIFICATION)
- 2 FLANGE
- 3 MANUAL AIR VENT
- 4 CALIBRATED BALANCING VALVE
- 5 MANUAL COIL AIR VENT
- 6 TWO-WAY CONTROL VALVE (ELECTRIC OR PNEUMATIC AS SPECIFIED)
- 7 COOLING COIL
- 8 THERMOMETER
- 9 DRAIN VALVE
- 10 COIL DRAIN VALVE
- 11 STRAINER
- 12 GATE VALVE WITH HOSE CONNECTION

NOTE:  
COIL HEIGHTS NOT TO EXCEED 45 INCHES. PROVIDE DRAIN PAN BETWEEN COILS.



- 1 BALL VALVE
- 2 UNION
- 3 MANUAL AIR VENT
- 4 CALIBRATED BALANCING VALVE
- 5 DRAIN VALVE
- 6 THREE-WAY CONTROL VALVE
- 7 HEATING COIL
- 8 THERMOMETER
- 9 FREEZE STAT (SERPENTINE)
- 10 GATE VALVE WITH HOSE CONNECTION

CONNECT TO EX. PIPING UON



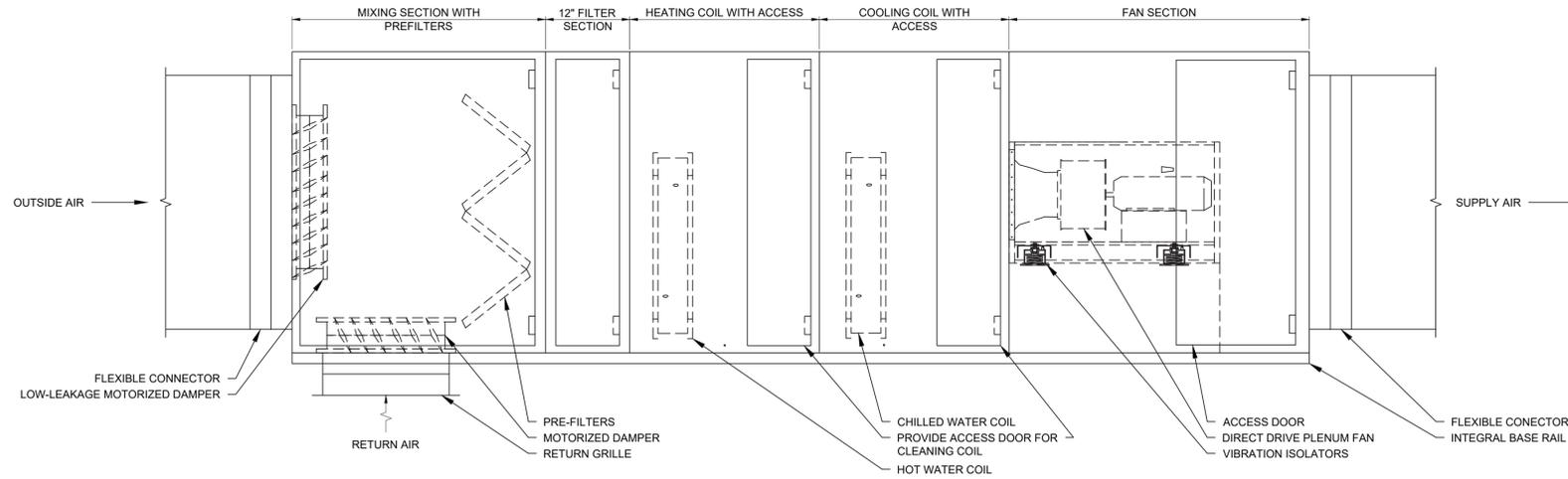
- 1 BALL VALVE (TYP.)
- 2 UNION (TYP.)
- 3 MANUAL AIR VENT
- 4 CALIBRATED BALANCING VALVE
- 5 DRAIN VALVE
- 6 CONTROL VALVE
- 7 4-PIPE COOLING/HEATING COIL
- 8 THERMOMETER
- 9 FREEZE STAT (SERPENTINE)
- 10 GATE VALVE WITH HOSE CONNECTION

CONNECT TO EX. PIPING UON

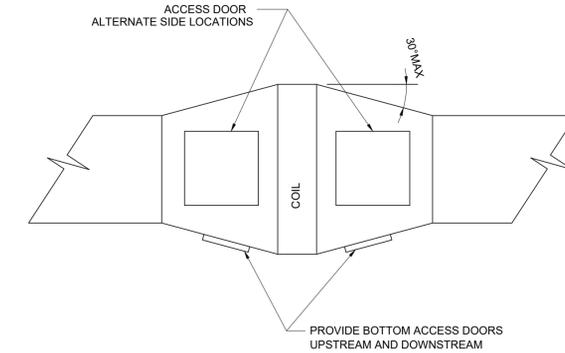
**1 CHILLED WATER COIL PIPING**  
SCALE: N.T.S.

**2 HOT WATER COIL PIPING**  
SCALE: N.T.S.

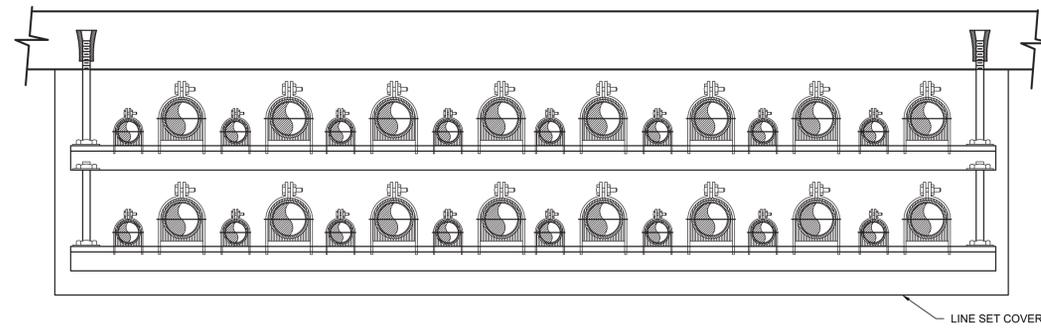
**3 FOUR PIPE UNIT VENTILATOR COIL PIPING**  
SCALE: N.T.S.



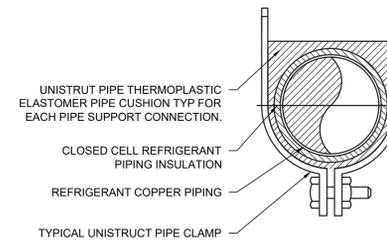
**4 AHU-20 CONFIGURATION**  
SCALE: N.T.S.



**5 DUCT-MOUNTED COIL ACCESS DOORS**  
SCALE: N.T.S.



**6 REFRIGERANT PIPING SUPPORT**  
SCALE: N.T.S.



No.	Date	Revisions
3	09-14-23	BIDDING DOCUMENTS
2	06-09-23	SED ADDENDUM #1
11	12-28-22	BIDDING DOCUMENTS

REC. EXP. DATE: 04-30-24

Drawn by	MEP
Checked by	PV
Project No.	42054
Scale	NTS
Date	09-14-23

GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861	Mechanical Structural Engineer
GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 1001 SUDBURY, NY 10861	Structural Engineer

UNIVENT  
REPLACEMENT AT  
WILLOW GROVE  
ELEMENTARY  
SED# 50-02 SCH-001-0-030-016  
COUNTY OF ROCKLAND  
###

**MSA**  
MICHAEL SHILALE ARCHITECTS, L.L.P.  
140 Park Avenue New City, NY 10956 Tel 845-708-9200  
www.shilale.com

© COPYRIGHT, MICHAEL SHILALE ARCHITECTS, ALL RIGHTS RESERVED.  
Drawing Title  
**MECHANICAL DETAILS**  
- 3  
Drawing No.  
**WGES-M-503**