MECHANICAL VENTILATION SCHEDULE

ROOM	OCCUPANY CLASSIFICATION	FLOOR AREA (FT^2)	ROOM VOLUME (FT^3)	OCCUPANT LOAD (OCCUPANT/1,000 FT^2)	# OF OCCUPANTS	REQUIRED CFM/OCCUPANT	REQUIRED CFM/FT^2	BREATHING ZONE OUTDOOR AIRFLOW (CFM)	ZONE DISTRIBUTION EFFECTIVENESS		TOTAL ROOM OUTDOOR AIR REQUIRED (CFM)		ACTUAL ROOM OUTDOOR AIRFLOW RATE (CFM)	
									COOLING	HEATING	COOLING	HEATING	COOLING	HEATING
CORRIDOR 1	CORRIDORS	1050	11550	0	0	0	0.06	63	0.9	0.9	70	70	70	70
CONFERENCE ROOM 100	CONFERENCE ROOMS	352	3872	50	18	5	0.06	109	0.9	0.9	121	121	125	125
SPEECH 101	OFFICE SPACES	259	2849	5	1	5	0.06	22	0.9	0.9	24	24	25	25
NURSE OFFICE 102	OFFICE SPACES	492	5412	5	2	5	0.06	42	0.8	0.8	52	52	55	55
ADMIN OFFICE 106	OFFICE SPACES	532	5852	5	3	5	0.06	45	0.8	0.8	57	57	60	60
PRINCIPAL OFFICE 106A	OFFICE SPACES	268	2948	5	1	5	0.06	23	0.8	0.8	28	28	30	30
OFFICE 107	OFFICE SPACES	179	1969	5	1	5	0.06	15	0.8	0.8	19	19	20	20
OFFICE 108	OFFICE SPACES	143	1573	5	1	5	0.06	12	0.8	0.8	15	15	20	20
OFFICE 110	OFFICE SPACES	108	1188	5	1	5	0.06	9	0.9	0.9	10	10	15	15
FACULTY OFFICE 111	OFFICE SPACES	530	5830	5	3	5	0.06	45	0.9	0.9	50	50	55	55
CLASSROOM 112	CLASSROOMS (AGES 5-8)	1061	11671	25	25	10	0.12	377	0.8	0.8	472	472	475	475
CLASSROOM 113	CLASSROOMS (AGES 5-8)	843	9273	25	21	10	0.12	312	0.8	0.8	390	390	390	390
CLASSROOM 114	CLASSROOMS (AGES 5-8)	952	10472	25	24	10	0.12	352	0.8	0.8	440	440	445	445
CLASSROOM 115	CLASSROOMS (AGES 5-8)	799	8789	25	20	10	0.12	296	0.8	0.8	370	370	370	370
CLASSROOM 116	CLASSROOMS (AGES 5-8)	950	10450	25	24	10	0.12	352	0.8	0.8	439	439	440	440
CLASSROOM 117	CLASSROOMS (AGES 5-8)	797	8767	25	20	10	0.12	295	0.8	0.8	369	369	370	370
FACULTY OFFICE 118	OFFICE SPACES	323	3553	5	2	5	0.06	27	0.9	0.9	31	31	35	35
CLASSROOM 119	CLASSROOMS (AGES 5-8)	797	8767	25	20	10	0.12	295	0.8	0.8	369	369	370	370
CLASSROOM 120	CLASSROOMS (AGES 5-8)	806	8866	25	20	10	0.12	298	0.8	0.8	373	373	375	375
CLASSROOM 121	CLASSROOMS (AGES 5-8)	795	8745	25	20	10	0.12	294	0.8	0.8	368	368	370	370
CLASSROOM 122	CLASSROOMS (AGES 5-8)	801	8811	25	20	10	0.12	296	0.8	0.8	370	370	375	375
LIBRARY 123	LIBRARIES	1977	21747	10	20	5	0.12	336	0.9	0.9	373	373	375	375
OFFICE 123A	OFFICE SPACES	123	1353	5	1	5	0.06	10	0.9	0.9	12	12	15	15
OFFICE 123B	OFFICE SPACES	175	1925	5	1	5	0.06	15	0.8	0.8	19	19	20	20
OFFICE 123C	OFFICE SPACES	120	1320	5	1	5	0.06	10	0.9	0.9	11	11	15	15
AV 125	OFFICE SPACES	124	1364	5	1	5	0.06	11	0.9	0.9	12	12	15	15
ART ROOM 126	CLASSROOMS (AGES 5-8)	775	8525	25	19	10	0.12	287	0.8	0.8	358	358	360	360
CLASSROOM 127	CLASSROOMS (AGES 5-8)	773	8503	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 128	CLASSROOMS (AGES 5-8)	770	8470	25	19	10	0.12	285	0.8	0.8	356	356	360	360
CLASSROOM 129	CLASSROOMS (AGES 5-8)	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 130	CLASSROOMS (AGES 5-8)	766	8426	25	19	10	0.12	283	0.8	0.8	354	354	355	355
OFFICE 132	OFFICE SPACES	116	1276	5	1	5	0.06	10	0.9	0.9	11	11	15	15
OFFICE 132A	OFFICE SPACES	98	1078	5	0	5	0.06	8	0.9	0.9	9	9	10	10
CLASSROOM 133	CLASSROOMS (AGES 5-8)	796	8756	25	20	10	0.12	295	0.8	0.8	368	368	370	370
CLASSROOM 134	CLASSROOMS (AGES 5-8)	791	8701	25	20	10	0.12	293	0.8	0.8	366	366	370	370
CLASSROOM 135	CLASSROOMS (AGES 5-8)	790	8690	25	20	10	0.12	292	0.8	0.8	365	365	370	370
ENL ROOM 136	OFFICE SPACES	456	5016	5	2	5	0.06	39	0.8	0.8	48	48	50	50
COPY ROOM 137	OFFICE SPACES	418	4598	5	2	5	0.06	36	0.9	0.9	39	39	40	40
MUSIC ROOM 140	MUSIC/THEATRE/DANCE	673	7403	35	24	10	0.06	276	0.8	0.8	345	345	345	345
STORAGE 140A	STORAGE	107	1177	0	0	0	0.12	13	0.9	0.9	14	14	15	15
RESOURCE ROOM	OFFICE SPACES	320	3520	5	2	5	0.06	27	0.9	0.9	30	30	35	35
GYM 143	GYMNASIUMS	2507	27577	7	18	20	0.18	802	0.9	0.9	891	891	895	895
OFFICE 143A	OFFICE SPACES	69	759	5	0	5	0.06	6	0.9	0.9	7	7	10	10
STORAGE 147	OFFICE SPACES	318	3498	5	2	5	0.06	27	0.9	0.9	30	30	35	35
S/L ROOM 149	OFFICE SPACES	259	2849	5	1	5	0.06	22	0.9	0.9	24	24	25	25
CUSTODIAN OFFICE 150	OFFICE SPACES	529	5819	5	3	5	0.06	45	0.9	0.9	50	50	50	50
CLASSROOM 218	CLASSROOMS (AGES 5-8)	761	8371	25	19	10	0.12	282	0.8	0.8	352	352	355	355
CLASSROOM 220	CLASSROOMS (AGES 5-8)	763	8393	25	19	10	0.12	282	0.8	0.8	353	353	355	355
CLASSROOM 222	CLASSROOMS (AGES 5-8)	766	8426	25	19	10	0.12	283	0.8	0.8	354	354	355	355
CLASSROOM 223	CLASSROOMS (AGES 5-8)	1029	11319	25	25	10	0.12	373	0.8	0.8	467	467	470	470
CLASSROOM 224	CLASSROOMS (AGES 5-8)	912	10032	25	23	10	0.12	337	0.8	0.8	422	422	425	425
CLASSROOM 225	CLASSROOMS (AGES 5-8)	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 226	CLASSROOMS (AGES 5-8)	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 227	CLASSROOMS (AGES 5-8)	781	8591	25	20	10	0.12	289	0.8	0.8	361	361	365	365
CLASSROOM 228	CLASSROOMS (AGES 5-8)	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
READING ROOM 229	OFFICE SPACES	470	5170	5	2	5	0.06	40	0.8	0.8	50	50	50	50
READING ROOM 230	OFFICE SPACES	409	4499	5	2	5	0.06	35	0.9	0.9	39	39	40	40
CLASSROOM 234	CLASSROOMS (AGES 5-8)	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 235	CLASSROOMS (AGES 5-8)	775	8525	25	19	10	0.12	287	0.8	0.8	358	358	360	360
COMPUTER LAB 236	COMPUTER LAB	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 237	CLASSROOMS (AGES 5-8)	775	8525	25	19	10	0.12	287	0.8	0.8	358	358	360	360
CLASSROOM 238	CLASSROOMS (AGES 5-8)	774	8514	25	19	10	0.12	286	0.8	0.8	358	358	360	360
CLASSROOM 239	CLASSROOMS (AGES 5-8)	772	8492	25	19	10	0.12	286	0.8	0.8	357	357	360	360
CLASSROOM 240	CLASSROOMS (AGES 5-8)	772	8492	25	19	10	0.12	286	0.8	0.8	357	357	360	360

RTU REMARKS:
1. BASIS OF DESIGN IS BY TRANE OR APPROVED EQUAL.
2. RTU - 1, 2, 3, MECHANICAL CONTRACTOR TO PROVIDE NEW 14" HIGH INSULATED ROOF CURB WITH VIBRATION ISOLATORS, GENERAL CONTRACTOR TO INSTALL.
3. PROVIDE SUPPLY AND RETURN SMOKE DETECTORS (FACTORY INSTALLED) TO SHUTDOWN UNIT.
4. PROVIDE 4" PLEATED AIR FILTERS, MERV 14 RATING, SEE SPEC 234100 FOR MORE INFO. CONTRACTOR TO REPLACE ALL FILTERS PRIOR TO TURN OVER.
5. PROVIDE START-UP BY MANUFACTURER'S AUTHORIZED TECHNICIAN.
6. SIEMENS TO BE CAPABLE OF 0-100% ECONOMIZER CONTROL OF UNIT.
7. UNIT TO BE DELIVERED VIA CRANES, ALL NECESSARY PERMITS FOR RIGGING REQUIRED.
8. CONTRACTOR TO PROVIDE FACTORY INSTALLED VFD W/ INTEGRAL MOTOR STARTERS FOR EACH FAN, EC TO FURNISH AND INSTALL NON-FUSIBLE TYPE DISCONNECT SWITCHES(FIELD INSTALL
9. GC TO FURNISH UNIT WITH CONVENIENCE OUTLET FURNISH AND INSTALL EXHAUST FAN SERVICE LIGHT. COORDINATE WITH EC.
10. PROVIDE WITH MODULATING DIGITAL SCROLL COMPRESSORS AND MODULATING HOT GAS REHEAT.
11. PROVIDE WITH 2" DOUBLE WALL CONSTRUCTION.
12. PROVIDE HOT GAS BYPASS WITH CONTINUOUS CAPACITY MODULATION (MAXIMUM 25% TOTAL CAPACITY).
13. SIEMENS SHALL PROVIDE BACNET/MSTP COMMUNICATION BUS WIRING BETWEEN RTU AND THE EXISTING SIEMENS LEVEL CONTROLLER.
14. SIEMENS SHALL CONTROL THE DUCT MOUNTED HOT WATER COIL SERVED BY RTU-1. SIEMENS SHALL FURNISH AND INSTALL ALL ASSOCIATED HOT WATER COIL DEVICES..
15. ALL FAN AND WHEEL VFDS TO BE PROVIDED WITH BACNET COMMUNICATION CARDS FOR INTEGRATION TO EXISTING SIEMENS BMS.
16. SIEMENS TO PROVIDE HEATING CONTROL VALVE, SEE COIL PIPING DETAILS ON DRAWING M503.VALVE TO BE INSTALLED BY MECHANICAL CONTRACTOR.
17. UNIT WEIGHT DOES NOT INCLUDES WEIGHT OF CURB. EXACT CURB WEIGHT TO BE CONFIRMED WITH MANUFACTURER.
18. CONTRACTOR TO FIELD INSTALL VIBRATION ISOLATION SUPPORTS FOR ENERGY RECOVERY WHEEL AT EACH UNIT.
19. POWER/CIRCUIT INFORMATION OF NEW UNITS TO BE COORDINATED WITH ELECTRICAL CONTRACTOR. SHOWN HERE FOR REFERENCE ONLY.

ROOFTOP HEAT PUMP UNIT SCHEDULE

UNIT #	AREA SERVED	COOLING										HEAT			FILTER	ELECTRICAL					WEIGHT (LBS)	EXISTING UNIT MODEL NO.	REMARKS
		SPEED CONTROL	TOTAL SUPPLY AIRFLOW (CFM)	MIN. OUTSIDE AIR (CFM)	ESP (IN WC)	NOMINAL CAPACITY (TONS)	REFRIG.	TOTAL CAPACITY (MBH)	SENS. CAPACITY (MBH)	EER	CONDENSER EAT (°F DB)		INPUT (MBH)	EAT/LAT	MERV	MCA 1	MAX FUSE SIZE 1	MCA 2	MAX FUSE SIZE 2	VOLT/PH/HZ			
RTU-1	LIBRARY	VARIABLE	3000	420	1.00	13.5	R410A	163.4	104.1	10.60	96	–	–	–	2-IN MERV 13	74.1	90	-	-	208/3/60	3421	TRANE HORIZON OADG020C1	HEAT PUMP
RTU-2	GYMNASIUM	VARIABLE	2000	650	1.00	7	R410A	85.5	57.5	9.5	96	–	87.5	0.6	2-IN MERV 13	110.0	125	42.0	70	208/3/60	2020	TRANE HORIZON OABE108A3	HEAT PUMP
RTU-3	GYMNASIUM	VARIABLE	2240	650	1.00	7	R410	85.5	57.5	16.4	96	–	87.5	0.6	2-IN MERV 13	110.0	125	42.0	70	208/3/60	2020	TRANE HORIZON OABE108A3	HEAT PUMP

FAN SCHEDULE

FAN #	SERVICE	LOCATION	TYPE	FAN DATA								BASIS OF DESIGN	
				AIRFLOW (CFM)	ESP. MIN (IN WC)	ESP. MAX (UN WC)	FAN RPM	MOTOR HP/WATTS	MOTOR RPM	V/PH/HZ	DRIVE TYPE	MANUFACTURER	MODEL #
EF - 1	ELECTRICAL CLOSET	150B	CENTRIFUGAL	50	0.375	0.375	900	18.6 WATTS	900	115/1/60	DIRECT	GREENHECK	SP-B80

FAN SCHEDULE NOTES:
1. INSTALL COOLING THERMOSTAT, PART 386367, SET TO 100° F

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE
0 1/2 1

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

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

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL
SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-015
SED# 50-02-01-06-0-024-015
7 GURNEE DR.
STONY POINT, NY 10980
STONY POINT
ROCKLAND COUNTY

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

Drawing Title
MECHANICAL SCHEDULES - 1

Drawing No.
SPES-M-003

UNIT VENTILATOR SCHEDULE

UNIT TAG	LOCATION	CONFIGURATION	TOTAL SUPPLY AIRFLOW (CFM)	MINIMUM OUTSIDE AIRFLOW			COOLING			HEATING			FILTER	ELECTRICAL			UNIT WEIGHT LBS	UNIT DIMENSIONS (LxH, IN)	UNIT DEPTH (IN)	BASIS OF DESIGN	NOTES
				COOLING	HEATING	TOTAL COOLING (MBH)	EADB (°F)	EAWB (°F)	MIN TOTAL CAPACITY (MBH)	EADB (°F)	LADB (°F)	REQUIRED TOTAL CAPACITY (MBH)	MERV	MCA	MAX FUSE SIZE	V/PH/HZ					
UV-102	RM 102	VERTICAL	750	55	55	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-106	RM 106	VERTICAL	750	60	60	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-106A	RM 106A	VERTICAL	750	30	30	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-107	RM 107	VERTICAL	750	20	20	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-108	RM 109	VERTICAL	750	20	20	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-112	RM 112	VERTICAL	1500	475	475	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-113	RM 113	VERTICAL	1500	390	390	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-114	RM 114	VERTICAL	1500	445	445	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-115	RM 115	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-116	RM 116	VERTICAL	1500	440	440	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-117	RM 117	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-119	RM 119	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-120	RM 120	VERTICAL	1500	375	375	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-121	RM 121	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-122	RM 122	VERTICAL	1500	375	375	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-123B	RM 123B	VERTICAL	750	20	20	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-126	RM 126	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-127	RM 127	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-128	RM 128	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-129	RM 129	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-130	RM 130	VERTICAL	1250	355	355	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-133	RM 133	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-134	RM 134	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-135	RM 135	VERTICAL	1500	370	370	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-136	RM 136	VERTICAL	1000	50	50	38.48	80.0	67.0	29,700	45.0	95	43.48	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE100	
UV-140	RM 140	VERTICAL	1250	345	345	46.46	80.0	67.0	37,100	45.0	95	55.36	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-149	RM 149	VERTICAL	750	30	30	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-218	RM 218	VERTICAL	1250	355	355	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	15	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-220	RM 220	VERTICAL	1250	355	355	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-222	RM 222	VERTICAL	1250	355	355	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-223	RM 223	VERTICAL	1500	470	470	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-224	RM 224	VERTICAL	1500	425	425	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-225	RM 225	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-226	RM 226	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-227	RM 227	VERTICAL	1500	365	365	55.02	80.0	67.0	44,600	45.0	95	63.8	13	8.38	20	115/1/60	470	105x30	21.25	TRANE VUVE150	
UV-228	RM 228	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-229	RM 229	VERTICAL	750	50	50	30.45	80.0	67.0	22,300	45.0	95	35.29	13	4.19	15	115/1/60	320	69x30	21.25	TRANE VUVE075	
UV-234	RM 234	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-235	RM 235	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-236	RM 236	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	55.36	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-237	RM 237	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-238	RM 238	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-239	RM 239	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	
UV-240	RM 240	VERTICAL	1250	360	360	46.46	80.0	67.0	37,100	45.0	95	63.8	13	8.38	20	115/1/60	450	93x30	21.25	TRANE VUVE125	

UNIT VENTILATOR SCHEDULE NOTES:

1. BASIS OF DESGN IS TRANE
2. CONTROLS TO BE FACTORY INSTALLED AND COMMISSIONED BY TRANE.
3. PROVIDE UNITS WITH VARIABLE FAN AIRFLOW CONTROL SEQUENCE
4. PROVIDE FACTORY-MOUNTED, PRE-PROGRAMMED, WIRELESS BACNET DDC CONTROL
5. PROVIDE WITH WIRELESS ZONE TEMPERATURE SENSOR
6. EQUIPMENT MANUFACTURER TO PROVIDE 2 YEAR PARTS AND LABOR WARRANTY
7. PROVIDE UNIT VENTILATORS WITH BLOW THROUGH CONFIGURATION
8. PROVIDE LEV KIT TO MEET SCHEDULE PERFORMANCE CAPACITY
9. PROVIDE DELUXE PIPING PACKAGE TO INCLUDE UNION, STRAINER, P/T PORT AND SHUTOFF VALVE ON THE SUPPLY LINE
10. PROVIDE DELUXE PIPING PACKAGE TO INCLUDE UNION, CONTROL VALVE AND MANUAL CIRCUIT SETTER ON THE RETURN LINE
11. PROVIDE A DRAIN PAN THAT IS NON-CORROSIVE AND REMOVABLE
12. PROVIDE SHELVING FROM HVAC CUSTOM ENCLOSURE FOR ALL CLASSROOMS AS REQUIRED
13. PROVIDE 21.25" DEEP END COVER AND FULL SHEET METAL BACK
14. PROVIDE A 2" SUBBASE FOR EACH UNIT VENTILATOR AT MINIMUM
15. MC TO PROVIDE NEW WALL BOXES AND WALL SLEEVES TO ACCOMMODATE THE EXISTING WALL OPENING
16. PROVIDE COLOR OPTIONS TO ARCHITECT FOR ALL UNIT VENTILATORS PRIOR TO RELEASING THE UNIT VENTILATORS FOR PRODUCTION
17. PROVIDE DX COOLING COIL IN EACH UNIT VENTILATOR
18. PROVIDE A 4 PIPE REHEAT HYDRONIC COIL IN EACH UNIT VENTILATOR.
19. PROVIDE MERV 13 FILTERS IN EACH UNIT VENTILATOR
20 MECHANICAL CONTRACTOR TO PROVIDE A FACTORY DISCONNECT. INSTALLATION BY ELECTRICAL CONTRACTOR.

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 BLUEGRASS BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1007250006.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-015
SED# 50-02-01-06-0-024-015

7 GITBRIE DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-708-8200
www.shilale.com

Drawing Title
MECHANICAL SCHEDULES - 2

Drawing No.
SPES-M-004

OUTDOOR CONDENSING UNIT SCHEDULE

UNIT #	LOCATION	TOTAL CAPACITY COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	EER	IEER	REFRIGERANT	REFRIGERANT SAFETY CLASS	REFRIGERANT CHARGE (LBS)	HEATING TYPE	CONDENSER	COMPRESSOR	ELECTRICAL							UNIT WEIGHT (LBS)	BASIS OF DESIGN		REMARKS
										EA DB °F (COOLING/HEATING)	TYPE (QUANTITY)	VOLTS	PHASE	Hz	Fuse Size (A)		MCA (A) (QUANTITY)			MANUFACTURER	MODEL #	
ACCU-1A	ROOF	264,000	295,000	11.3	23.5	R410A	A1	41.375	HEAT PUMP	90/11	SCROLL (2)	208	3	60	60	60	60	56	1,302	TRANE	TURYE2643BN41AN	SEE NOTES
ACCU-1B	ROOF	264,000	295,000	11.3	23.5	R410A	A1	41.375	HEAT PUMP	90/11	SCROLL (2)	208	3	60	60	60	60	56	1,302	TRANE	TURYE2643BN41AN	SEE NOTES
ACCU-2	ROOF	288,000	323,000	10.9	23.1	R410A	A1	47.375	HEAT PUMP	90/11	SCROLL (2)	208	3	60	60	60	60	60	1,360	TRANE	TURYE2883BN41AN	SEE NOTES
ACCU-3A	ROOF	216,000	243,000	11.6	23.3	R410A	A1	35.25	HEAT PUMP	90/11	SCROLL (2)	208	3	60	60	45	56	44	1,174	TRANE	TURYP2163BN41AN	SEE NOTES
ACCU-3B	ROOF	96,000	108,000	13.7	26.5	R410A	A1	17.625	HEAT PUMP	90/11	SCROLL (2)	208	3	60	45	-	44	-	613	TRANE	TURYE0963AN41AN	SEE NOTES
ACCU-4	ROOF	192,000	215,000	12.7	25.3	R410A	A1	35.25	HEAT PUMP	90/11	SCROLL (2)	208	3	60	45	45	44	44	1,226	TRANE	TURYE1923BN41AN	SEE NOTES
ACCU-5	ROOF	192,000	215,000	12.7	25.3	R410A	A1	35.25	HEAT PUMP	90/11	SCROLL (2)	208	3	60	45	45	44	44	1,226	TRANE	TURYE1923BN41AN	SEE NOTES
ACCU-6	ROOF	216,000	243,000	12.2	24.6	R410A	A1	35.25	HEAT PUMP	90/11	SCROLL (2)	208	3	60	60	45	56	44	1,235	TRANE	TURYE2163BN41AN	SEE NOTES

OUTDOOR CONDENSING UNIT SCHEDULE NOTES

1. NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB/WB), OUTDOOR OF 95°F (DB)
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70°F (DB), OUTDOOR OF 43°F (WB)
3. EFFICIENCY VALUES FOR EER, IEER, COP ARE BASED ON AHRI 1230 TEST METHOD FOR MIXTURE OF DUCTED & NON-DUCTED INDOOR UNITS.
4. FOR SYSTEMS WITH MULTIPLE MODULES, REFRIGERANT PIPE DIMENSIONS INDICATE TOTAL SYSTEM COMBINED PIPING DOWNSTREAM OF MODULE TWINNING.
5. ADDED FIELD CHARGE LISTED IS IN ADDITION TO FACTORY CHARGE, THIS MUST BE UPDATED BASED UPON FINAL AS-BUILT PIPING LAYOUT.

INDOOR VRF UNIT SCHEDULE

UNIT TAG	LOCATION	CONFIGURATION	TOTAL SUPPLY AIRFLOW (CFM)	MINIMUM OUTSIDE AIRFLOW		CAPACITY (BTU/H)		REFRIGERANT	REFRIGERANT SAFETY CLASS	V/PH/HZ	POWER COOLING (kW)	POWER HEATING (kW)	MCA	MAX FUSE SIZE	UNIT WEIGHT LBS	UNIT DIMENSIONS (LxH, IN)	UNIT DEPTH (IN)	BASIS OF DESIGN	NOTES
				COOLING	HEATING	COOLING	HEATING												
CC-1	CORRIDOR	CEILING CASSETTE	600	25	25	15,000	17,000	R410A	A1	208/1/60	0.03	0.02	0.39	15	46	33-3/32 x 33-3/29	10-3/16	TPLFYP015EM140B	SEE NOTES
CC-2	CORRIDOR	CEILING CASSETTE	600	25	25	15,000	17,000	R410A	A1	208/1/60	0.03	0.02	0.39	15	46	33-3/32 x 33-3/30	10-3/16	TPLFYP015EM140B	SEE NOTES
CC-3	CORRIDOR	CEILING CASSETTE	600	20	20	15,000	17,000	R410A	A1	208/1/60	0.03	0.02	0.39	15	46	33-3/32 x 33-3/31	10-3/16	TPLFYP015EM140B	SEE NOTES
CC-100	RM 100	CEILING CASSETTE	565	125	125	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-101	RM 101	CEILING CASSETTE	565	25	25	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-110	RM 110	CEILING CASSETTE	565	15	15	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-111	RM 111	CEILING CASSETTE	565	55	55	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-118	RM 118	CEILING CASSETTE	565	55	55	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-132	RM 132	CEILING CASSETTE	459	15	15	6,000	6,700	R410A	A1	208/1/60	0.02	0.02	0.24	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP006EM140B	SEE NOTES
CC-132A	RM 132A	CEILING CASSETTE	459	10	10	6,000	6,700	R410A	A1	208/1/60	0.02	0.02	0.24	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP006EM140B	SEE NOTES
CC-137	RM 137	CEILING CASSETTE	565	40	40	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-142	RM 142	CEILING CASSETTE	565	35	35	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-143A	RM 143A	CEILING CASSETTE	565	10	10	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-147	RM 147	CEILING CASSETTE	565	35	35	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-150	RM 150	CEILING CASSETTE	565	50	50	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES
CC-230	RM 230	CEILING CASSETTE	565	40	40	12,000	13,500	R410A	A1	208/1/60	0.03	0.03	0.39	15	46	33-3/32 x 33-3/32	10-3/16	TPLFYP012EM140B	SEE NOTES

INDOOR VRF UNIT SCHEDULE NOTES:

1. NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB/WB), OUTDOOR OF 95°F (DB)
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70°F (DB), OUTDOOR OF 43°F (WB)
3. SEE OUTDOOR UNIT SCHEDULE FOR OUTDOOR AMBIENT CONDITIONS, CONNECTED CAPACITY, AND OTHER FACTORS ASSOCIATED WITH CORRECTED CAPACITIES.
4. SEE SCHEMATIC PIPING/CONTROL DIAGRAM FOR INDICATION OF REQUIRED INDOOR UNIT REMOTE CONTROLLERS, SYSTEM CONTROLLERS, AND INTEGRATION DEVICES.
5. FULL DEMAND CORRECTED CAPACITY INCLUDES DE-RATE ASSOCIATED WITH INDOOR VS. OUTDOOR CONNECTED CAPACITY INDICATED ON OUTDOOR UNIT SCHEDULE FOR ASSOCIATED SYSTEM.PARTIAL CORRECTED CAPACITY ASSUMES SUFFICIENT DIVERSITY EXISTS SUCH THAT THE
6. IT IS RECOMMENDED TO ALWAYS BASE HEATING CORRECTED CAPACITY ON FULL DEMAND.
7. PROVIDE MULTI-FUNCTION CASEMENT WITH HIGH EFFICIENCY FILTER ELEMENT
8 PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH.

HOT WATER COIL SCHEDULE

TAG	SERVICE	TOTAL HEATING CAPACITY (BTU/H)	SUPPLY AIRFLOW (CFM)	AIR				WATER			ROWS	OVERALL DIMENSIONS (WxH)(IN)	BASIS OF DESIGN
				PRESS. DROP (IN WC)	EAT (°F DB)	LAT (°F DB)	MAX. FACE VELOCITY (FPM)	FLOW RATE (GPM)	EWT	LWT			
HWC-1	RTU-1	178940	5000	0.109	45.0	78.0	571	17.87	180	160	1	36x36	TRANE D5WB36035

NOTES:
1. THE COILS SHALL BE FACTORY INSTALLED WITHIN A DOUBLE-WALLED, INSULATED HOUSING COMPLETE WITH ACCESS DOORS AND DRAIN PLAN.
2. PROVIDE WITH INTEGRAL BASE FRAME.
3. PROVIDE AE-200 CONTROLLER OR APPROVED EQUAL.

BOOSTER FAN SCHEDULE

UNIT TAG	SERVES	FAN						BASIS OFDESIGN		NOTES
		TYPE	DRIVE	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	V/PH/HZ	MANUFATURER	MODEL NUMBER	
BF-100	CC-100	INLINE	DIRECT	140	0.25	0.75	120/1/60	S&P	TD-125	SEE NOTES
BF-101	CC-101	INLINE	DIRECT	30	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-110	CC-110	INLINE	DIRECT	15	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-111	CC-111	INLINE	DIRECT	60	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-118	CC-118	INLINE	DIRECT	35	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-132	CC-132	INLINE	DIRECT	15	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-132A	CC-132A	INLINE	DIRECT	15	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-137	CC-137	INLINE	DIRECT	45	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-142	CC-142	INLINE	DIRECT	35	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-143A	CC-135A	INLINE	DIRECT	10	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-147	CC-147	INLINE	DIRECT	35	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-150	CC-150	INLINE	DIRECT	60	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES
BF-230	CC-230	INLINE	DIRECT	45	0.25	0.45	120/1/60	S&P	TD-100	SEE NOTES

BOOSTER FAN SCHEDULE NOTES:

1. PROVIDE ELECTONICALLY COMMUTATED MOTOR, DISCONNECT SWITCH, MOTORIZED BACKDRAFT DAMPER, AND PROGRAMABLE TIMECLOCK.

VRF HEAT RECOVERY BRANCH CIRCUIT CONTROLLER

System Tag	Tag Reference	M-NET Address	Model Number	Type (double / Main / Sub)	Number of Ports	Connected Capacity to BC	Voltage / Phase	MCA 208/230	Notes / Options
ACCU-1A	BC-1A	53	TCMBM1012JA11N4	Main	12	297,000.0	208/230V/1-phase	1.19/1.39	1
ACCU-1B	BC-1B	63	TCMBM1012JA11N4	Main	12	303,000.0	208/230V/1-phase	1.19/1.39	1
ACCU-2	BC-2	70	TCMBM1012JA11N4	Main	12	300,000.0	208/230V/1-phase	1.19/1.39	1
ACCU-3A	BC-3	81	TCMBM1012JA11N4	Main	12	234,000.0	208/230V/1-phase	1.19/1.39	1
ACCU-3B	BC-3B	88	TCMBM0108JA11N4	Main	8	108,000.0	208/230V/1-phase	0.83/0.97	1
ACCU-4	BC-4	53	TCMBM0108JA11N4	Main	8	228,000.0	208/230V/1-phase	0.83/0.97	1
ACCU-5	BC-5	58	TCMBM0108JA11N4	Main	8	216,000.0	208/230V/1-phase	0.83/0.97	1
ACCU-6	BC-6	64	TCMBM0108JA11N4	Main	8	240,000.0	208/230V/1-phase	0.83/0.97	1

Notes & Options:

1 Include Diamondback Ball Valves BV-Series, 700PSIG working pressure, full port, 410A rated.

2 For sub BC controller CMB-P-NU-GB1 or -GB, the total connectable indoor unit capacity can be 126,000 BTUs or less. If two sub BC controllers are used, the total indoor unit capacity connected to BOTH sub BC controllers also cannot exceed 126,000 BTUs. For sub BC controller CMB-P1016NU-HB1 the total connectable indoor unit capacity can be 126,000 BTUs or less. However, if two sub controllers are used, and one of them is CMB-1016NU-

ELECTRIC UNIT HEATER SCHEDULE

TAG	SERVICE	LOCATION	HEATING CAPACITY (BTU/H)	HEATING CAPACITY (KW)	AIRFLOW (CFM)	TEMPERATURE RISE (°F)	MOTOR HP	V/PH/HZ	MANUFACTUER	MODEL
EUH - 1	ELECTRICAL CLOSET	150B	11,200	3.3	400	26	1/30	208/1/60	MARKEL	F2F5103N

ELECTRIC UNIT HEATER SCHEDULE NOTES:
1. WITH CEILING MOUNTING BRACKET

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 4304O
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 BROADWAY BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. 1007250006.00
Mechanical & Electrical Engineer:

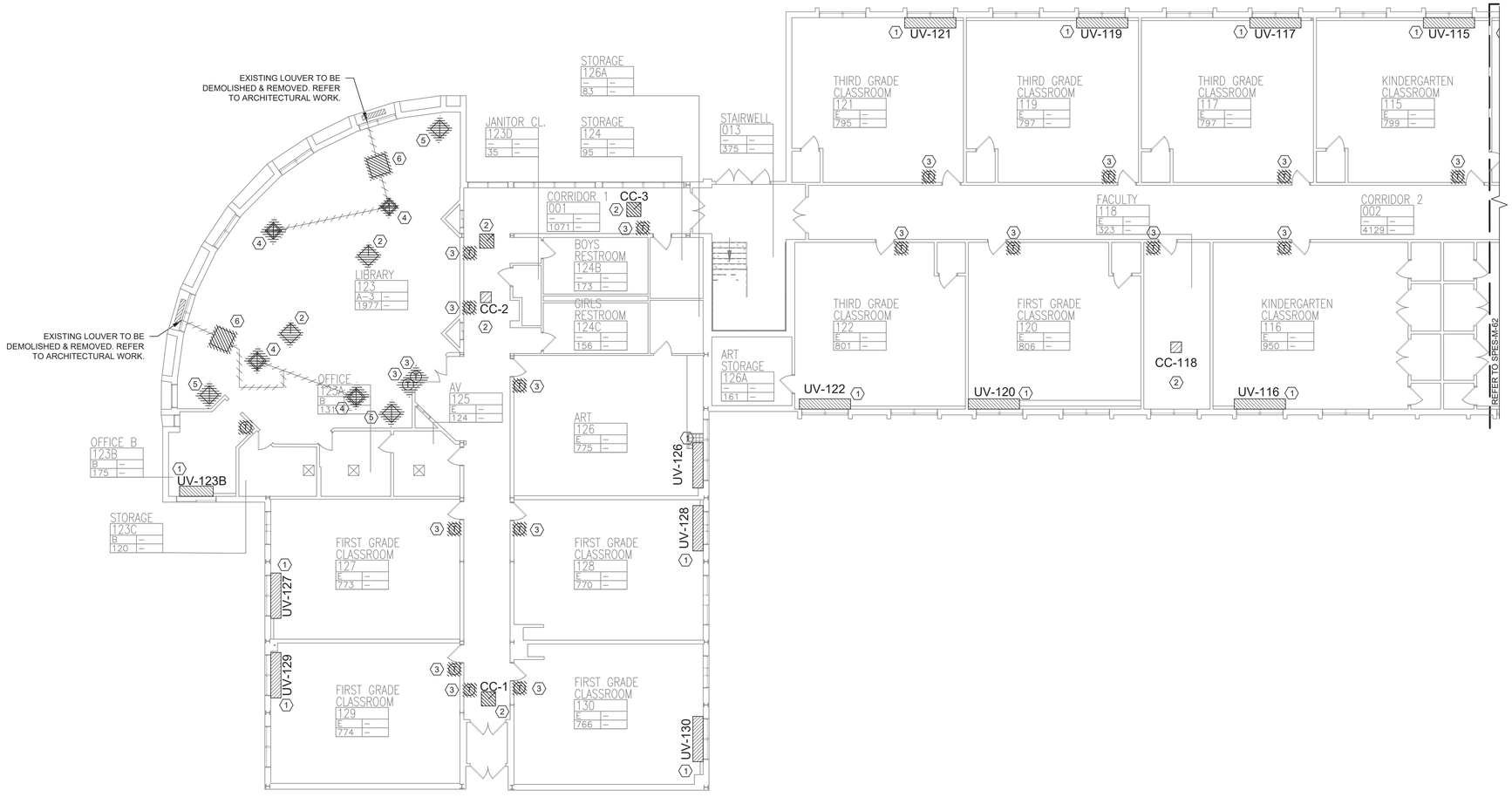
GREENMAN PEDERSEN, INC
2 BROADWAY BOULEVARD
SUITE 202
SUFFERN, NY 10901
Structural Engineer:

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL
SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015
7 GUINEA DR.
STONY POINT, NY 10980
STONY POINT ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-709-8000
www.shilale.com

Drawing Title
MECHANICAL SCHEDULES - 3

Drawing No.
SPES-M-005



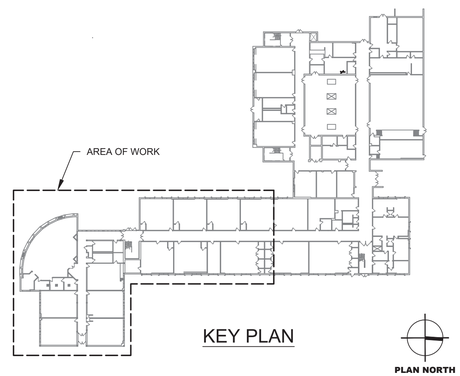
KEYED NOTES:

1. DISCONNECT, REMOVE UNIT VENTILATOR CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING TEMPORARILY FOR REUSE. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN. DISCONNECT & DISPOSE OF ASSOCIATED THERMOSTAT. SEE DETAIL 1/M501.
2. DISCONNECT EXISTING CEILING CASSETTE AND ASSOCIATED CONTROLS & THERMOSTAT. REMOVE REFRIGERANT PIPING & ROOFTOP CONDENSING UNIT.
3. EXISTING THERMOSTATS FOR EXISTING HEATING & VENTILATING UNIT TO BE DEMOLISHED & REMOVED.
4. EXISTING SUPPLY DIFFUSER TO BE DEMOLISHED & REMOVED.
5. EXISTING RETURN GRILLE & REGISTER TO BE DEMOLISHED & REMOVED.
6. EXISTING HEATING & VENTILATING UNIT TO BE DEMOLISHED & REMOVED. CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING TEMPORARILY FOR REUSE.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

1 FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 1

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



Drawing Title: **FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 1**

Drawing No.: **SPES-M-061**

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by: VF/AW
Checked by: EF
Project No.: 43040
Scale: AS NOTED
Date: 03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO.: 1807250006.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

7 CUTOKER DR.
STONY POINT, NY 10980

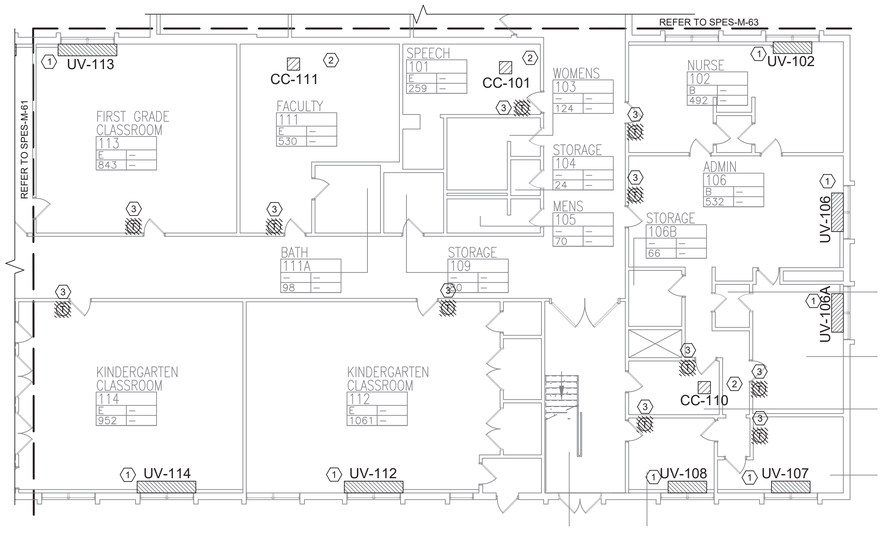
STONY POINT
ROCKLAND COUNTY

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

KEYED NOTES:

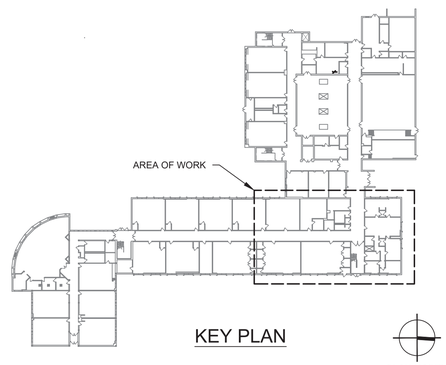
1. DISCONNECT & REMOVE UNIT VENTILATOR. CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING TEMPORARILY FOR REUSE. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN. DISCONNECT & DISPOSE OF ASSOCIATED THERMOSTAT. SEE DETAIL 1/M501.
2. DISCONNECT EXISTING CEILING CASSETTE AND ASSOCIATED CONTROLS. REMOVE EXISTING ROOFTOP UNIT AND CONDENSING PIPING..
3. EXISTING THERMOSTATS FOR EXISTING HEATING & VENTILATING UNIT TO BE DEMOLISHED & REMOVED.

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 2

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. No. 1SPC2500088.00

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-013
SED# 50-02-01-06-0-024-015

7 GITBRIDE DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-709-8200
www.shilale.com

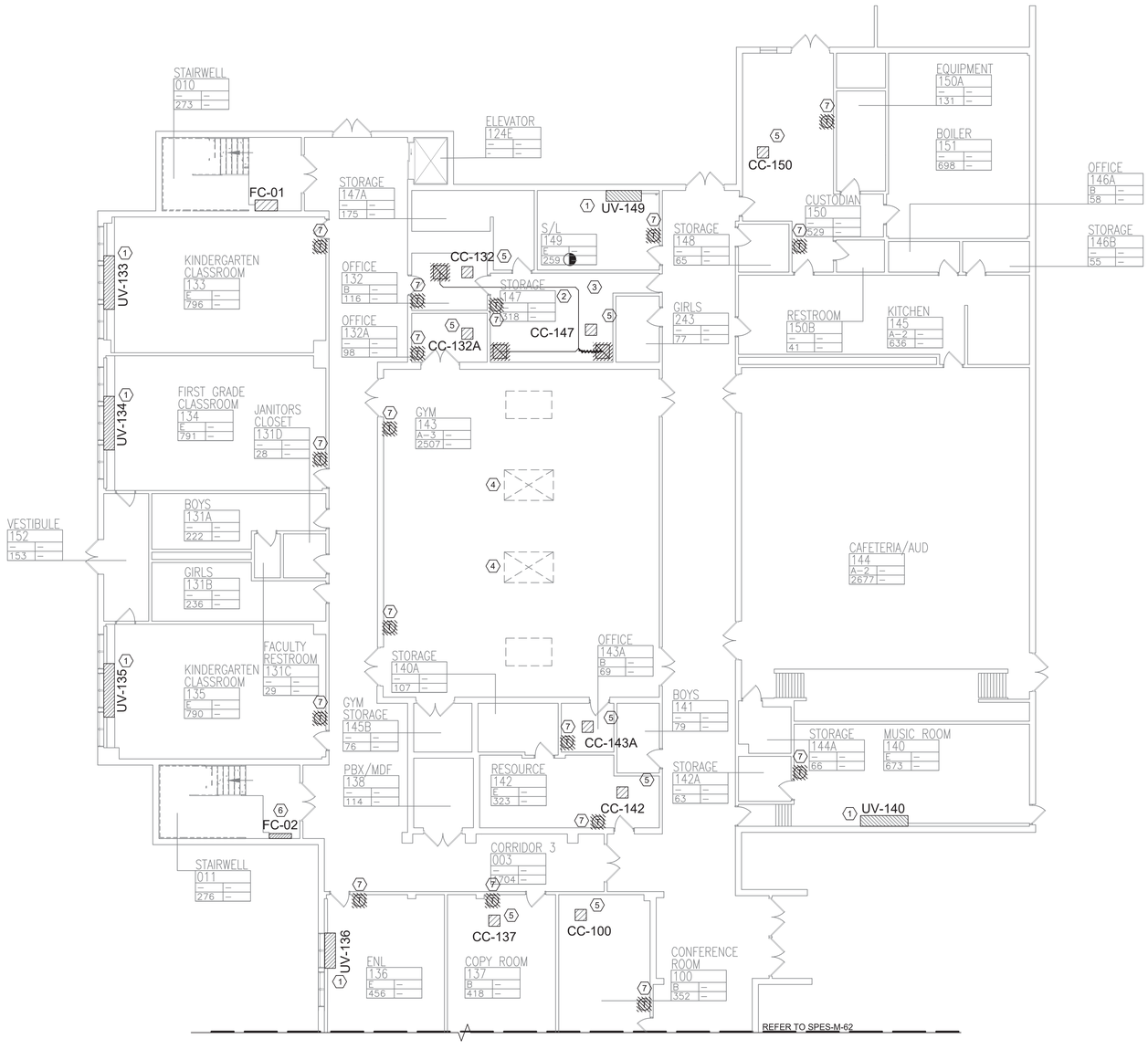
Drawing Title
FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 2

Drawing No.
SPES-M-062

KEYED NOTES:

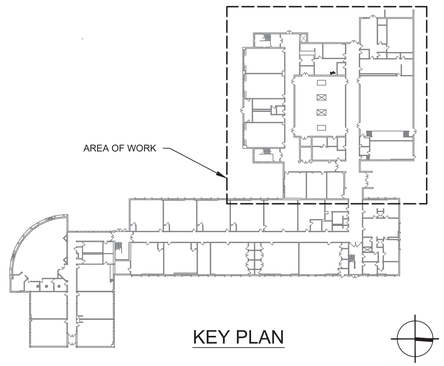
1. DISCONNECT AND REMOVE UNIT VENTILATOR CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING TEMPORARILY FOR REUSE. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN. DISCONNECT ASSOCIATED THERMOSTAT. SEE DETAIL 1/M501.
2. EXISTING EXHAUST DUCTWORK TO REMAIN.
3. EXISTING EXHAUST DUCT UP TO ROOF TO REMAIN.
4. EXISTING DUCTWORK TO REMAIN IN GYM AS BACKUP (HV ONLY).
5. EXISTING CEILING CASSETTE TO BE DEMOLISHED & REMOVED.
6. DISCONNECT AND REMOVE EXISTING FAN COIL UNIT. CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING PIPING BACK TO WALL PENETRATION.
7. EXISTING THERMOSTATS FOR EXISTING HEATING & VENTILATING UNIT TO BE DEMOLISHED & REMOVED.

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 3

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 RESEARCH BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1807C0000000.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-010
SED# 50-02-01-06-0-024-015

7 GURNEE DR
STONY POINT, NY 10980
STONY POINT
ROCKLAND COUNTY

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

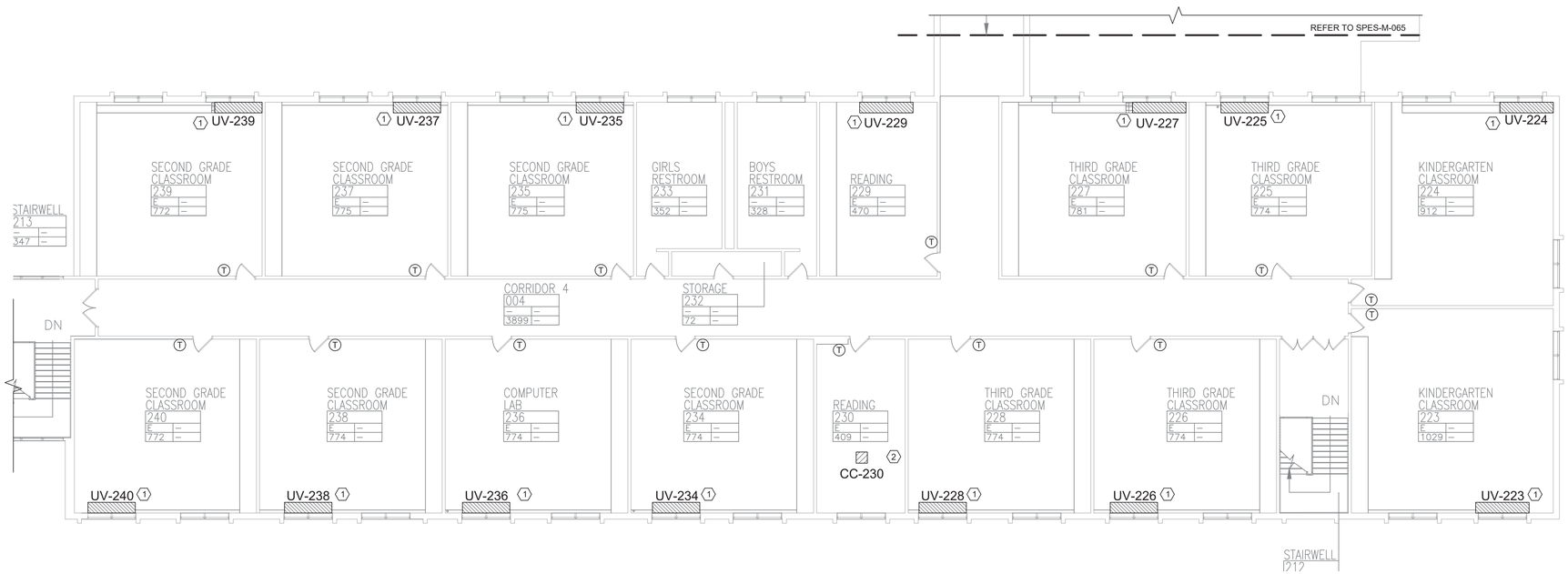
Drawing Title
FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 3

Drawing No.
SPES-M-063

KEYED NOTES:

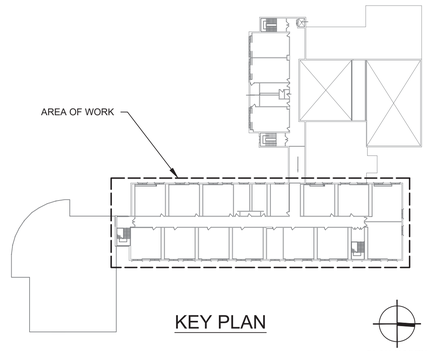
1. DISCONNECT, REMOVE UNIT VENTILATOR CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING TEMPORARILY FOR REUSE. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN. DISCONNECT & DISPOSE OF ASSOCIATED THERMOSTAT. SEE DETAIL 1/M501.
2. DISCONNECT EXISTING CEILING CASSETTE AND ASSOCIATED CONTROLS. REMOVE EXISTING ROOFTOP UNIT AND CONDENSING PIPING.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 SECOND FLOOR PARTIAL REMOVAL - MECHANICAL - 1

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1007250006.00

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

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-08-0-014-012
SED# 50-02-01-08-0-024-014
SED# 50-02-01-08-0-024-015

7 GUENOC DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

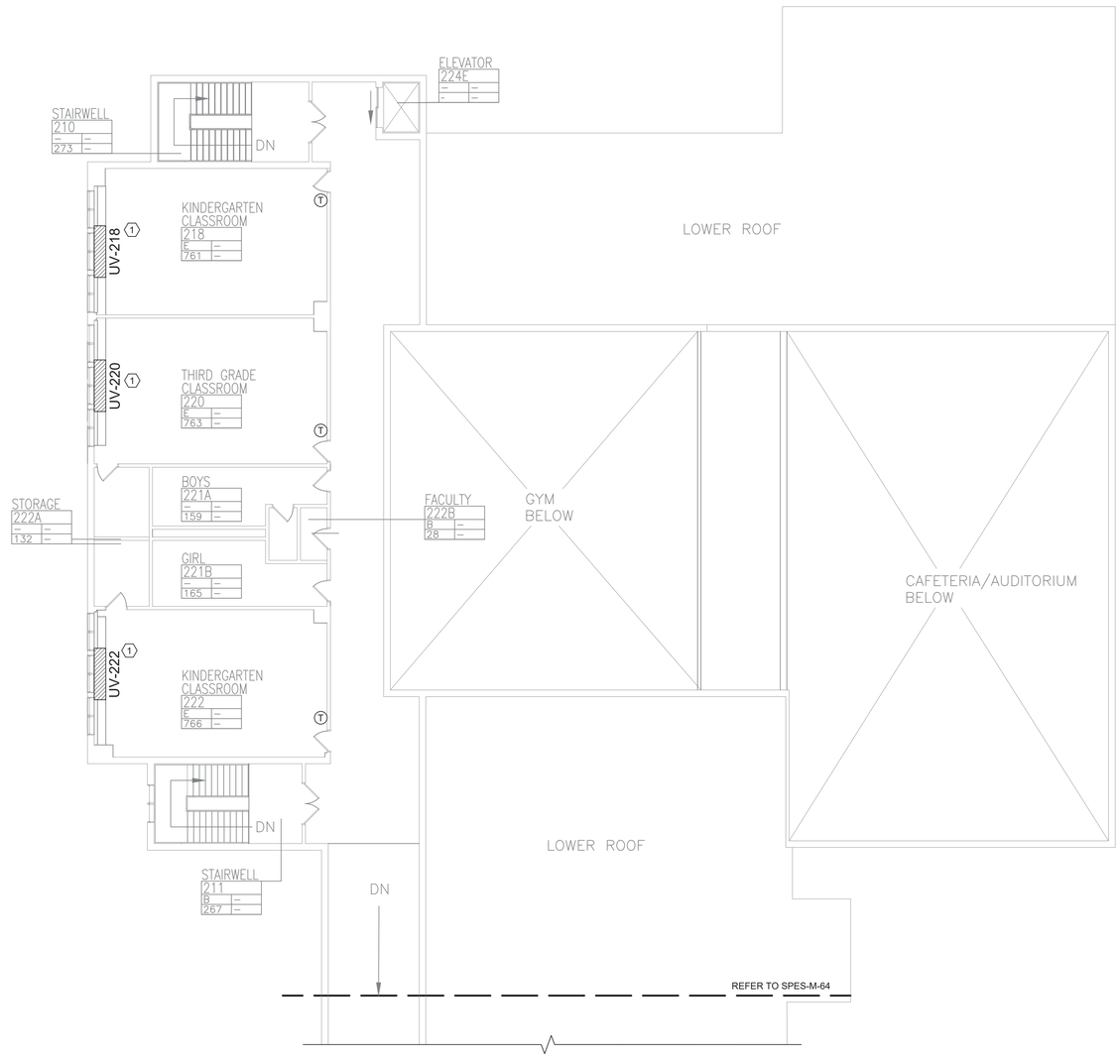
Drawing Title
SECOND FLOOR PARTIAL REMOVAL - MECHANICAL - 1

Drawing No.
SPES-M-064

KEYED NOTES:

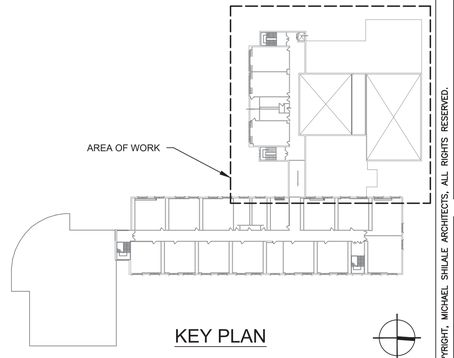
1. DISCONNECT, REMOVE UNIT VENTILATOR CUT AND CAP HOT WATER SUPPLY AND RETURN PIPING TEMPORARILY FOR REUSE. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN.DISCONNECT & DISPOSE OF ASSOCIATED THERMOSTAT. SEE DETAIL 1/M501.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 FIRST FLOOR PARTIAL REMOVAL - MECHANICAL - 2

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by	VF/AW
Checked by	EF
Project No.	4304O
Scale	AS NOTED
Date	03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1807250006.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVERSTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-015
SED# 50-02-01-06-0-024-015

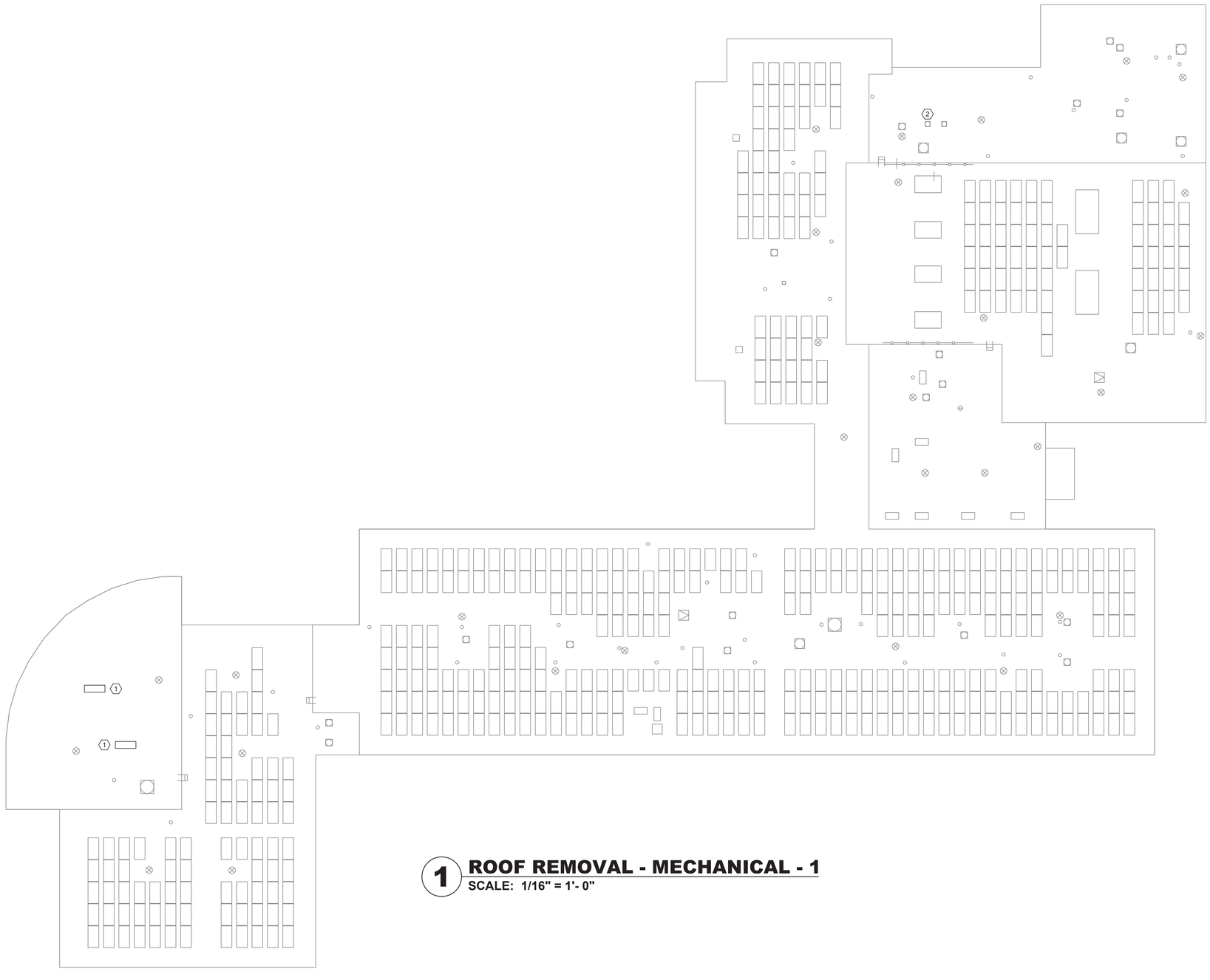
7 CLUBHOUSE DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
SECOND FLOOR PARTIAL REMOVAL - MECHANICAL - 2

Drawing No.
SPES-M-065



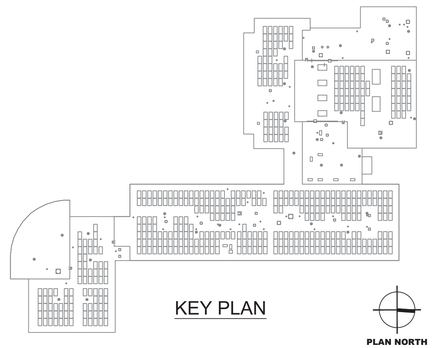
KEYED NOTES:

1. DISCONNECT AND REMOVE EXISTING CONDENSER UNIT AND ASSOCIATED PIPING.
2. DISCONNECT AND REMOVE EXISTING EXHAUST FAN.

1/32" 1 0
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

1 ROOF REMOVAL - MECHANICAL - 1

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



KEY PLAN

PLAN NORTH

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by	VF/AW
Checked by	EF
Project No.	43040
Scale	AS NOTED
Date	03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1SPC2500068.00

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-015
SED# 50-02-01-06-0-024-015

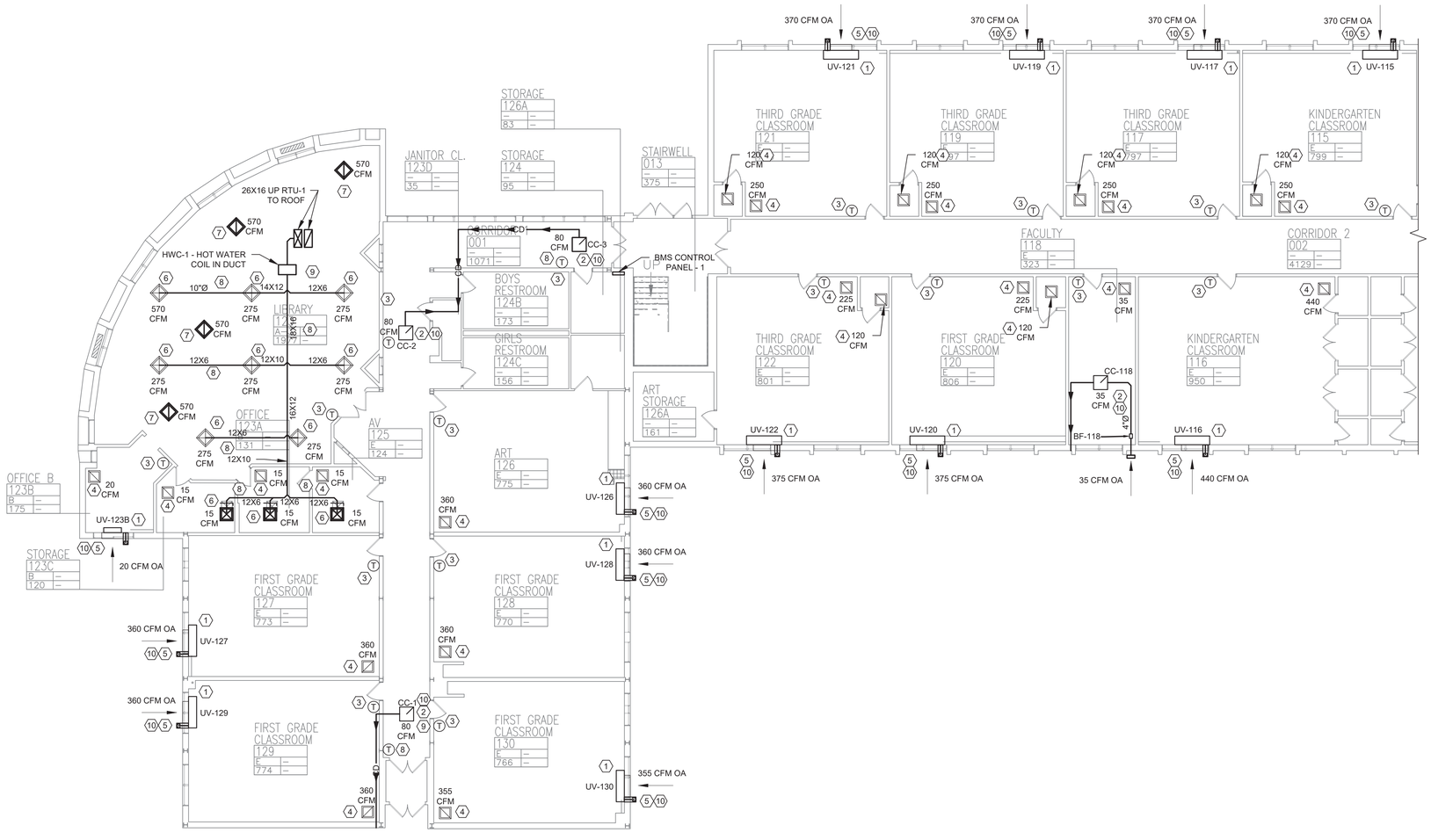
7 GUERNE DR
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
ROOF REMOVAL - MECHANICAL

Drawing No.
SPES-M-066



1 FIRST FLOOR PARTIAL PLAN - MECHANICAL - 1

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

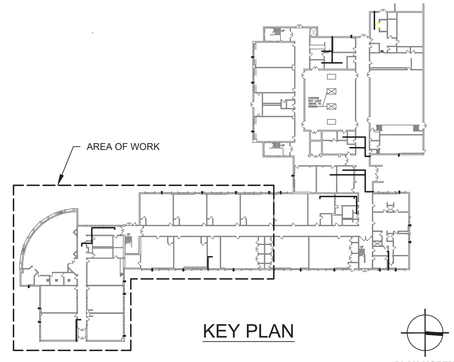
KEYED NOTES:

1. INSTALL AND CONNECT DX HEAT PUMP WITH HOT WATER BACKUP UNIT VENTILATOR, CONNECT HOT WATER SUPPLY AND RETURN PIPING TO EXISTING HOT WATER SYSTEM. CONNECT DUCTWORK/UV TO EXISTING OUTSIDE SLEEVE, PATCH AND MODIFY AS REQUIRED. SEE DETAILS 5/M501, 2/M502, 3/M502.
2. INSTALL AND CONNECT CEILING CASSETTE AND FRESH AIR DUCT AS INDICATED WITH BOOSTER FAN. SEE DETAIL 1/M503.
3. INSTALL AND CONNECT SYSTEM THERMOSTAT FOR HOT WATER COIL.
4. BALANCE EXISTING EXHAUST GRILLE.
5. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN AND CONNECT TO NEW UNITS.
6. INSTALL SUPPLY DIFFUSER. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
7. INSTALL RETURN GRILLE. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
8. INSTALL INSULATED DUCTWORK ABOVE SUSPENDED CEILING.
9. NEW HOT WATER COIL CONNECT AS SHOWN SEE 3/M-502
10. ¾" CONDENSATE PIPE TO RUN OUTSIDE ON SPLASH BLOCK OR TERMINATE IN AIR GAP AT SLOP SINK IN JANITOR CLOSET.

GENERAL NOTES:

1. RELIEF PATH FOR OUTSIDE AIR IS VIA EXHAUST GRILLES IN EXHAUST ROOMS.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

Mechanical & Electrical Engineer: GREENMAN PEDERSEN, INC 2 EXECUTIVE BOULEVARD SUITE 302 SUFFERN, NY 10901 PROJ. NO. 1NYC250006.00

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVERSTRAW ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

7 GUINEA DR. STONY POINT, NY 10980

STONY POINT ROCKLAND COUNTY

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

Drawing Title **FIRST FLOOR PARTIAL PLAN - MECHANICAL - 1**

Drawing No. **SPES-M-101**

KEYED NOTES:

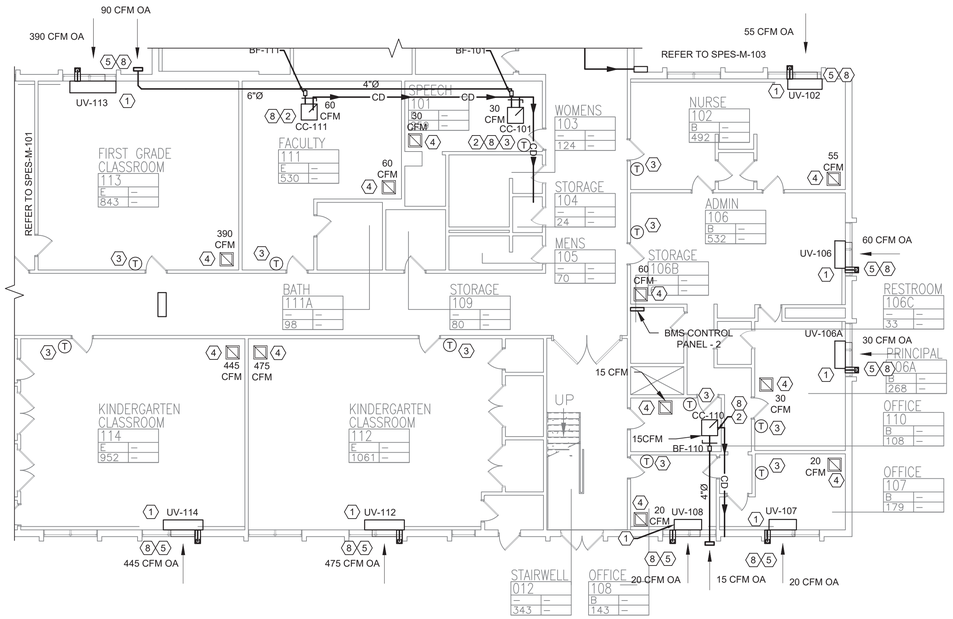
1. INSTALL AND CONNECT DX HEAT PUMP WITH HOT WATER BACKUP UNIT VENTILATOR, CONNECT HOT WATER SUPPLY AND RETURN TO EXISTING HOT WATER SYSTEM. CONNECT TO EXISTING OUTSIDE SLEEVE, PATCH AND MODIFY AS REQUIRED. SEE DETAILS 5/M501, 2/M502, 3/M502.
2. INSTALL AND CONNECT CEILING CASSETTE AND FRESH AIR DUCT WITH BOOSTER FAN AS INDICATED. SEE DETAIL 1/M503.
3. INSTALL AND CONNECT SYSTEM THERMOSTAT.
4. BALANCE EXISTING EXHAUST GRILLE.
5. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN AND CONNECT TO NEW UNIT.
6. INSTALL SUPPLY DIFFUSER. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
7. INSTALL RETURN GRILLE. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
8. ¾" CONDENSATE PIPE TO RUN OUTSIDE ON SPLASH BLOCK OR TERMINATE IN AIR GAP AT SLOP SINK IN JANITOR CLOSET.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

0 — 1/2 — 1

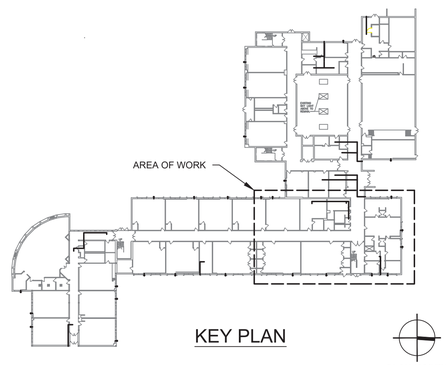
GENERAL NOTES:

1. RELIEF PATH FOR OUTSIDE AIR IS VIA EXHAUST GRILLES IN EXHAUST ROOMS.



1 FIRST FLOOR PARTIAL PLAN - MECHANICAL - 2

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 18PC2500068.00

Mechanical & Electrical Engineer:

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

Structural Engineer:

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

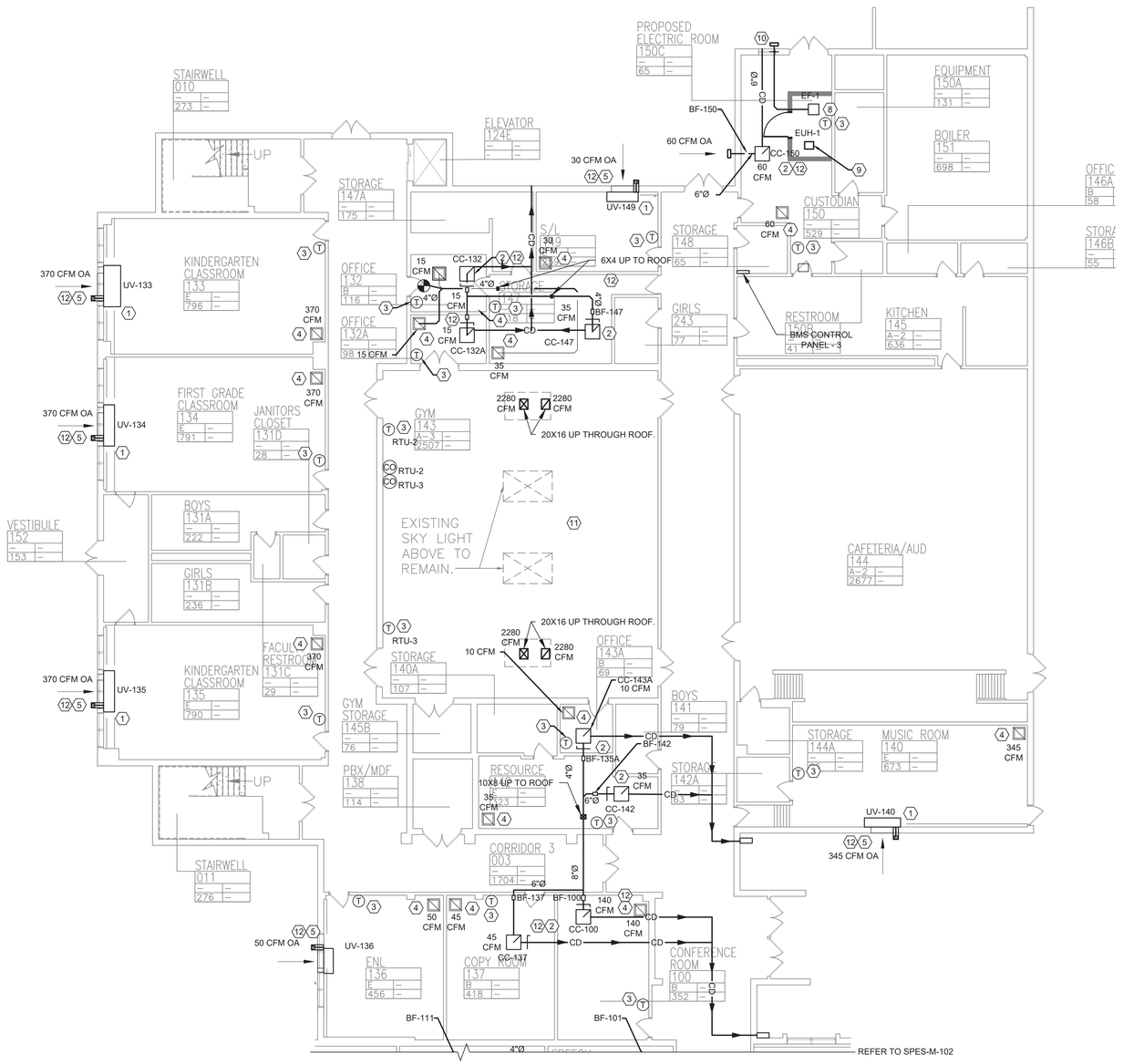
7 CUTHER DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
FIRST FLOOR PARTIAL PLAN - MECHANICAL - 2

Drawing No.
SPES-M-102



1 FIRST FLOOR PARTIAL PLAN - MECHANICAL - 3

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

KEYED NOTES:

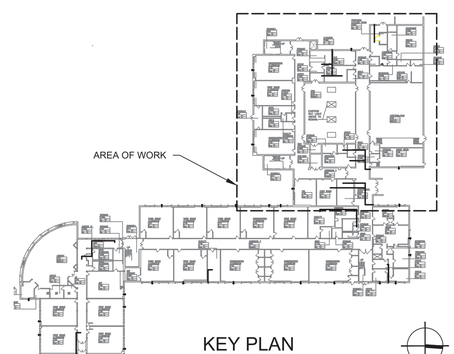
1. INSTALL AND CONNECT DX HEAT PUMP WITH HOT WATER BACKUP UNIT VENTILATOR, CONNECT HOT WATER SUPPLY AND RETURN TO EXISTING HOT WATER SYSTEM. CONNECT TO EXISTING OUTSIDE SLEEVE, PATCH AND MODIFY AS REQUIRED. SEE DETAILS 5/M501, 2/M502, 3/M502.
2. INSTALL AND CONNECT CEILING CASSETTE AND FRESH AIR DUCT AS INDICATED. SEE DETAIL 1/M503. INSULATE ALL DUCTWORK AND BOOSTER FAN.
3. INSTALL AND CONNECT SYSTEM THERMOSTAT.
4. BALANCE EXISTING EXHAUST GRILLE.
5. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN.
6. INSTALL SUPPLY DIFFUSER. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
7. INSTALL RETURN GRILLE. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
8. INSTALL INDOOR EXHAUST FAN AND DUCTWORK. SEE DETAIL.
9. INSTALL ELECTRIC UNIT HEATER, EUH-1.
10. INSTALL LOUVER, L-1.
11. EXISTING DUCTWORK TO REMAIN IN GYM AS BACKUP (HV ONLY).
12. ¾" CONDENSATE PIPE TO RUN OUTSIDE ON SPLASH BLOCK OR NEAREST JANITORS CLOSET.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

0 1/2 1

GENERAL NOTES:

1. RELIEF PATH FOR OUTSIDE AIR IS VIA EXHAUST GRILLES IN EXHAUST ROOMS.



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. LBFC2500088.00

Mechanical & Electrical Engineer:

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

Structural Engineer:

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-016
SED# 50-02-01-06-0-024-015

7 GUENEE DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
FIRST FLOOR PARTIAL PLAN - MECHANICAL - 3

Drawing No.
SPES-M-103

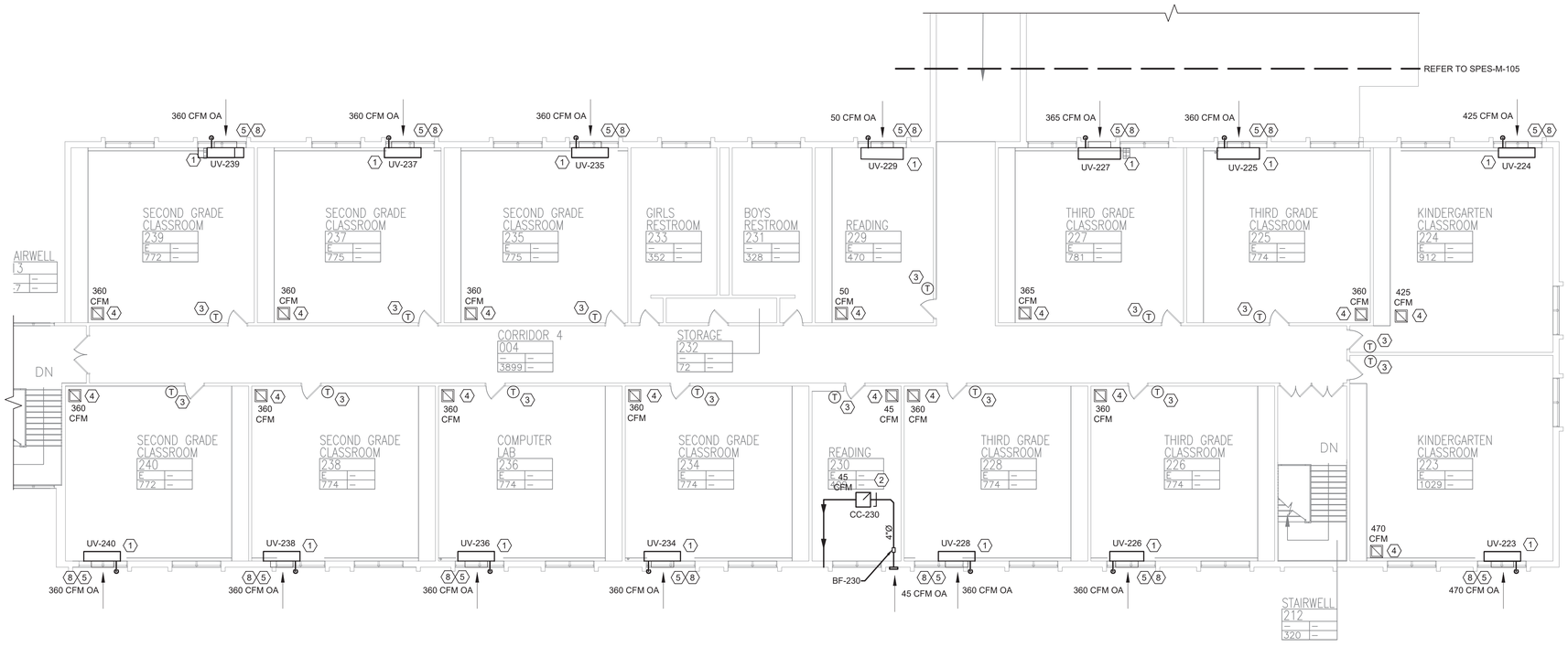
GENERAL NOTES:

1. RELIEF PATH FOR OUTSIDE AIR IS VIA EXHAUST GRILLES IN EXHAUST ROOMS.

KEYED NOTES:

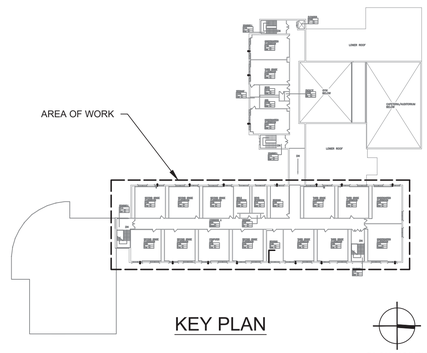
1. INSTALL AND CONNECT DX HEAT PUMP WITH HOT WATER BACKUP UNIT VENTILATOR, CONNECT HOT WATER SUPPLY AND RETURN TO EXISTING HOT WATER SYSTEM. CONNECT TO EXISTING OUTSIDE SLEEVE, PATCH AND MODIFY AS REQUIRED. SEE DETAILS 5/M501, 2/M502, 3/M502.
2. INSTALL AND CONNECT CEILING CASSETTE AND FRESH AIR DUCT WITH BOOSTER FAN AS INDICATED. SEE DETAIL 1/M503. INSULATE ALL DUCTWORK AND BOOSTER FAN.
3. INSTALL AND CONNECT SYSTEM THERMOSTAT.
4. BALANCE EXISTING EXHAUST GRILLE.
5. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN AND CONNECT TO NEW UNITS.
6. INSTALL SUPPLY DIFFUSER. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
7. INSTALL RETURN GRILLE. BALANCE TO CFM AMOUNT SHOWN ON PLANS.
8. ¾" CONDENSATE PIPE TO RUN OUTSIDE TO SPLASHBACK OR NEAREST JANITORS CLOSET.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 SECOND FLOOR PARTIAL PLAN - MECHANICAL - 1

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1NYP250008.00
Mechanical & Electrical Engineer:

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

7 GUINEA DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-709-8500
www.shilale.com

Drawing Title
SECOND FLOOR PARTIAL PLAN - MECHANICAL - 1

Drawing No.
SPES-M-104

KEYED NOTES:

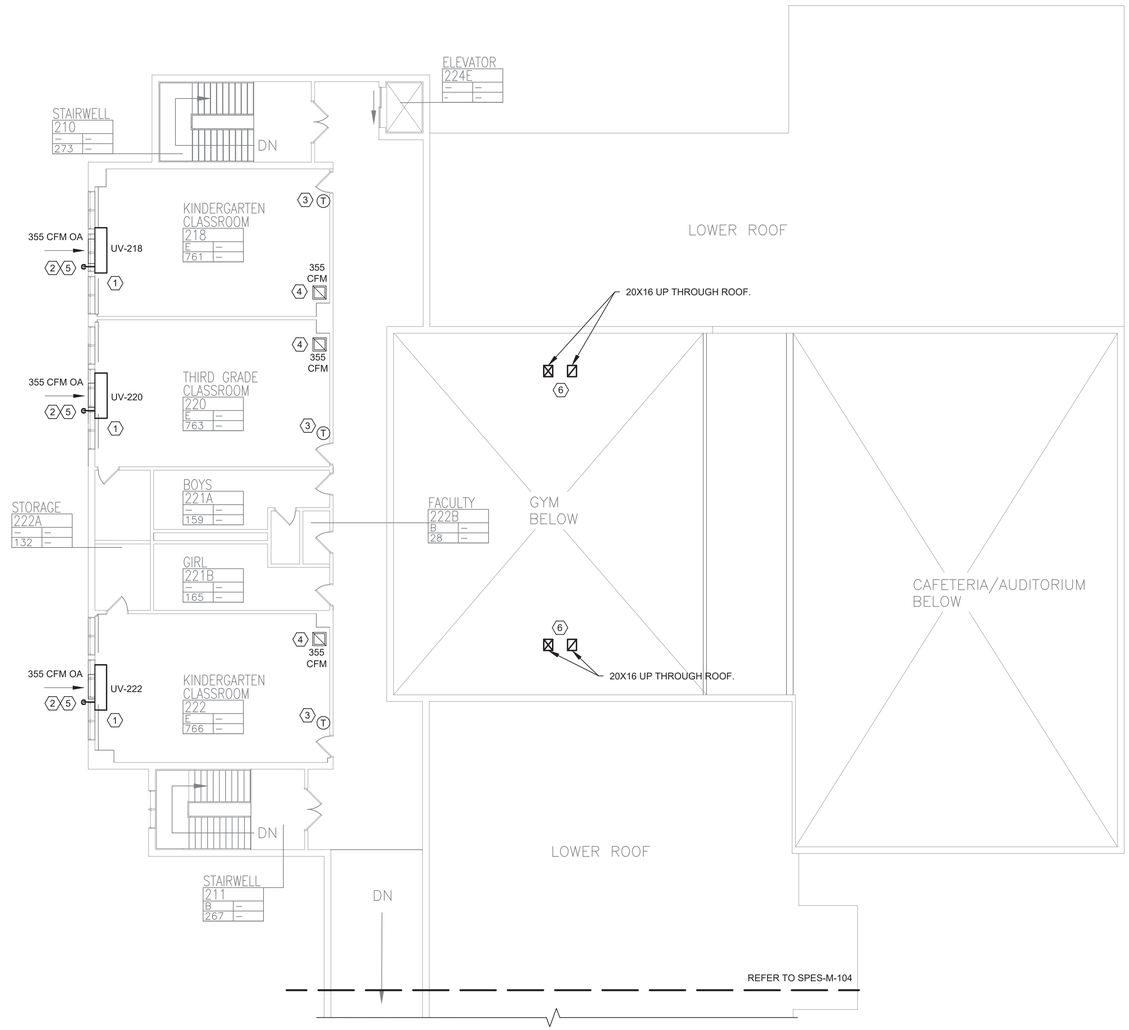
1. INSTALL AND CONNECT DX HEAT PUMP WITH HOT WATER BACKUP UNIT VENTILATOR, CONNECT HOT WATER SUPPLY AND RETURN TO EXISTING HOT WATER SYSTEM. CONNECT TO EXISTING OUTSIDE SLEEVE, PATCH AND MODIFY AS REQUIRED. SEE DETAILS 5/M501, 2/M502, 3/M502.
2. ¾" CONDENSATE PIPE TO RUN OUTSIDE OR NEAREST JANITORS CLOSET
3. INSTALL AND CONNECT SYSTEM THERMOSTAT.
4. BALANCE EXISTING EXHAUST GRILLE.
5. EXISTING OUTSIDE LOUVER AND SLEEVE TO REMAIN AND CONNECT TO NEW UNIT.
6. PROVIDE SUPPLY AND RETURN DUCTWORK UP THOUGH ROOF TO RTU-2&3. SEE DETAIL XXX

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

0 — 1/2 — 1

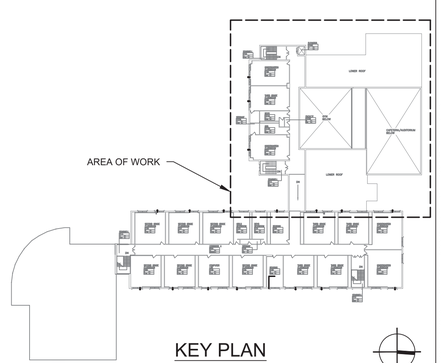
GENERAL NOTES:

1. RELIEF PATH FOR OUTSIDE AIR IS VIA EXHAUST GRILLES IN EXHAUST ROOMS.



1 SECOND FLOOR PARTIAL PLAN - MECHANICAL - 2

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
Mechanical & Electrical Engineer:
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. 1NYC250008.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

7 CUTHER DR.
STONY POINT, NY 10980
STONY POINT
ROCKLAND COUNTY

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

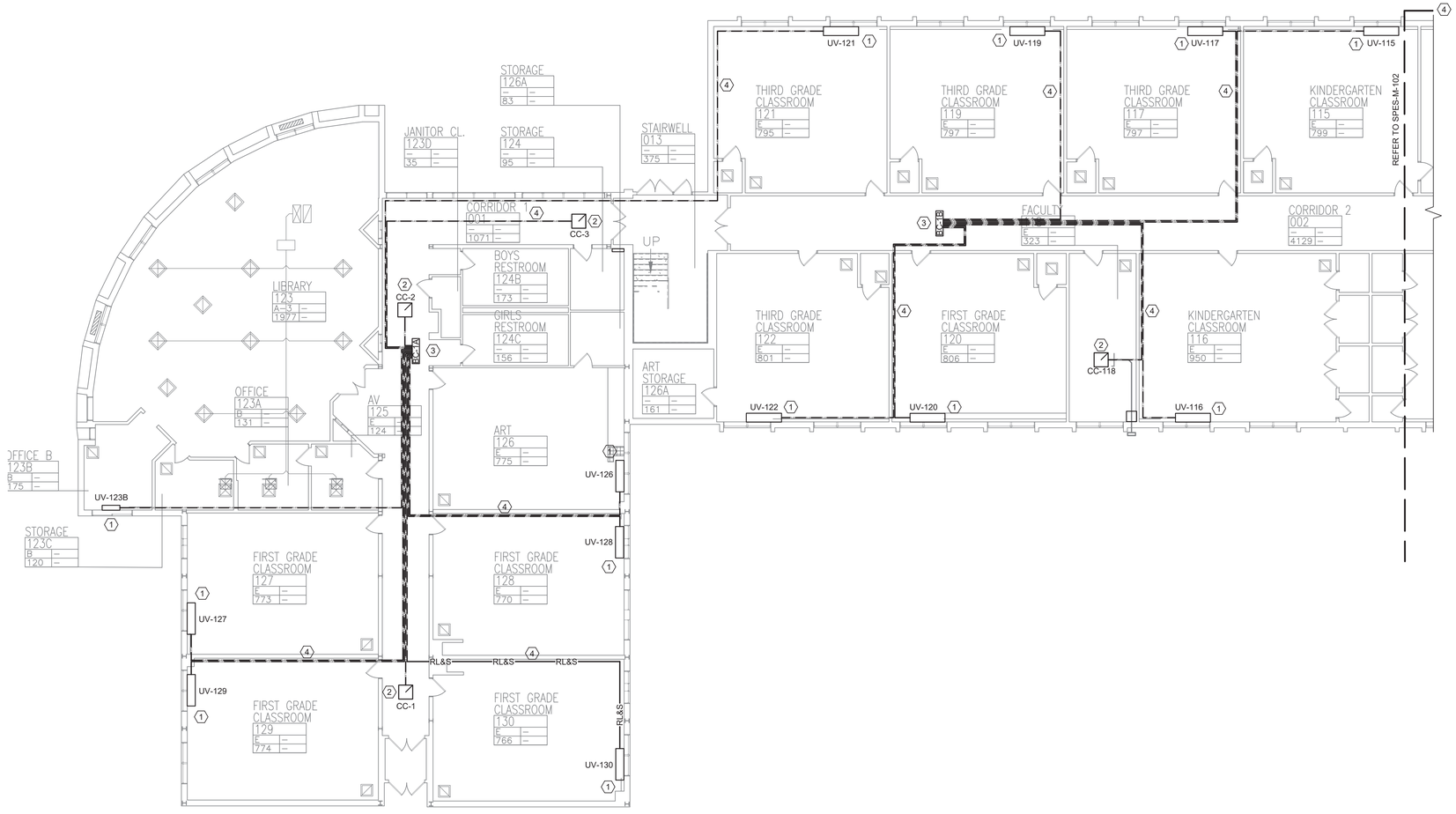
Drawing Title
SECOND FLOOR PARTIAL PLAN - MECHANICAL - 2

Drawing No.
SPES-M-105

KEYED NOTES:

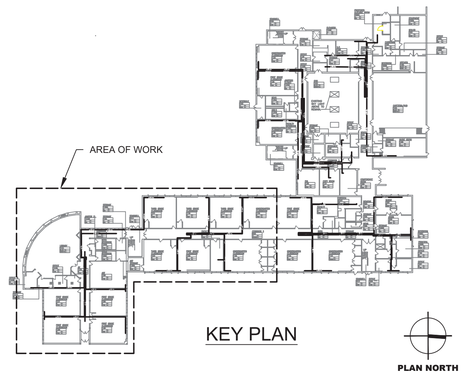
1. NEW UNIT VENTILATOR.
2. NEW CEILING CASSETTE.
3. INSTALL BRANCH CONTROLLER ABOVE SUSPENDED CEILING. PROVIDE ASSOCIATED SUPPORT. SEE DETAIL 5/M502.
4. INSTALL, ROUTE, AND CONNECT REFRIGERANT PIPING AS INDICATED ABOVE SUSPENDED CEILING. COORDINATE WITH ARCHITECT DRAWINGS .

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 MECHANICAL FIRST FLOOR PARTIAL PLAN - REFRIGERANT PIPING - 1

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by	VF/AW
Checked by	EF
Project No.	43040
Scale	
Date	03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1SPC2500088.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

7 GUERNER DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-708-9500
www.shilale.com

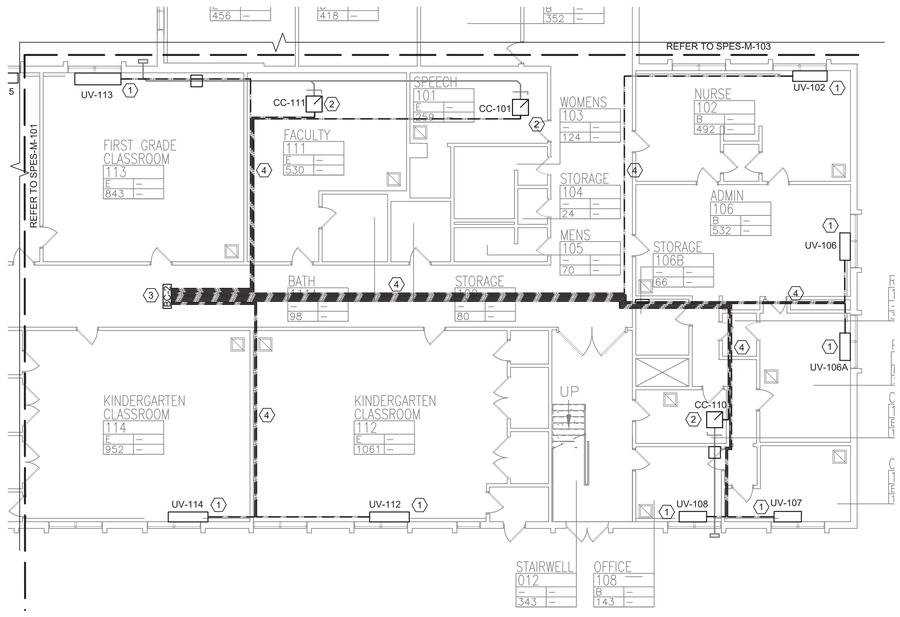
Drawing Title
FIRST FLOOR PART. PLAN - REFG. PIPING - 1

Drawing No.
SPES-M-106

KEYED NOTES:

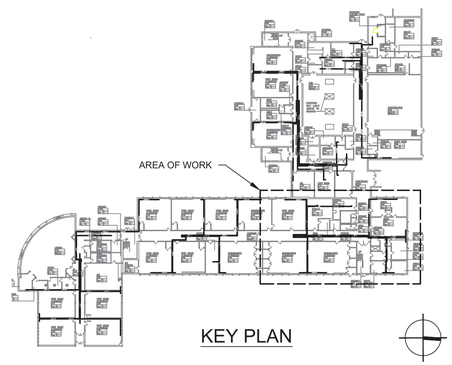
1. NEW UNIT VENTILATOR.
2. NEW CEILING CASSETTE.
3. INSTALL BRANCH CONTROLLER IN SUSPENDED CEILING. SEE DETAIL 5/M502.
4. INSTALL, ROUTE, AND CONNECT REFRIGERANT PIPING AS INDICATED ABOVE SUSPENDED CEILING. COORDINATE WITH ARCHITECT DRAWINGS .

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 MECHANICAL FIRST FLOOR PARTIAL PLAN - REFRIGERANT PIPING - 2

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. 1SPCS2500088.00

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

7 GITBRIDE DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-709-8200
www.shilale.com

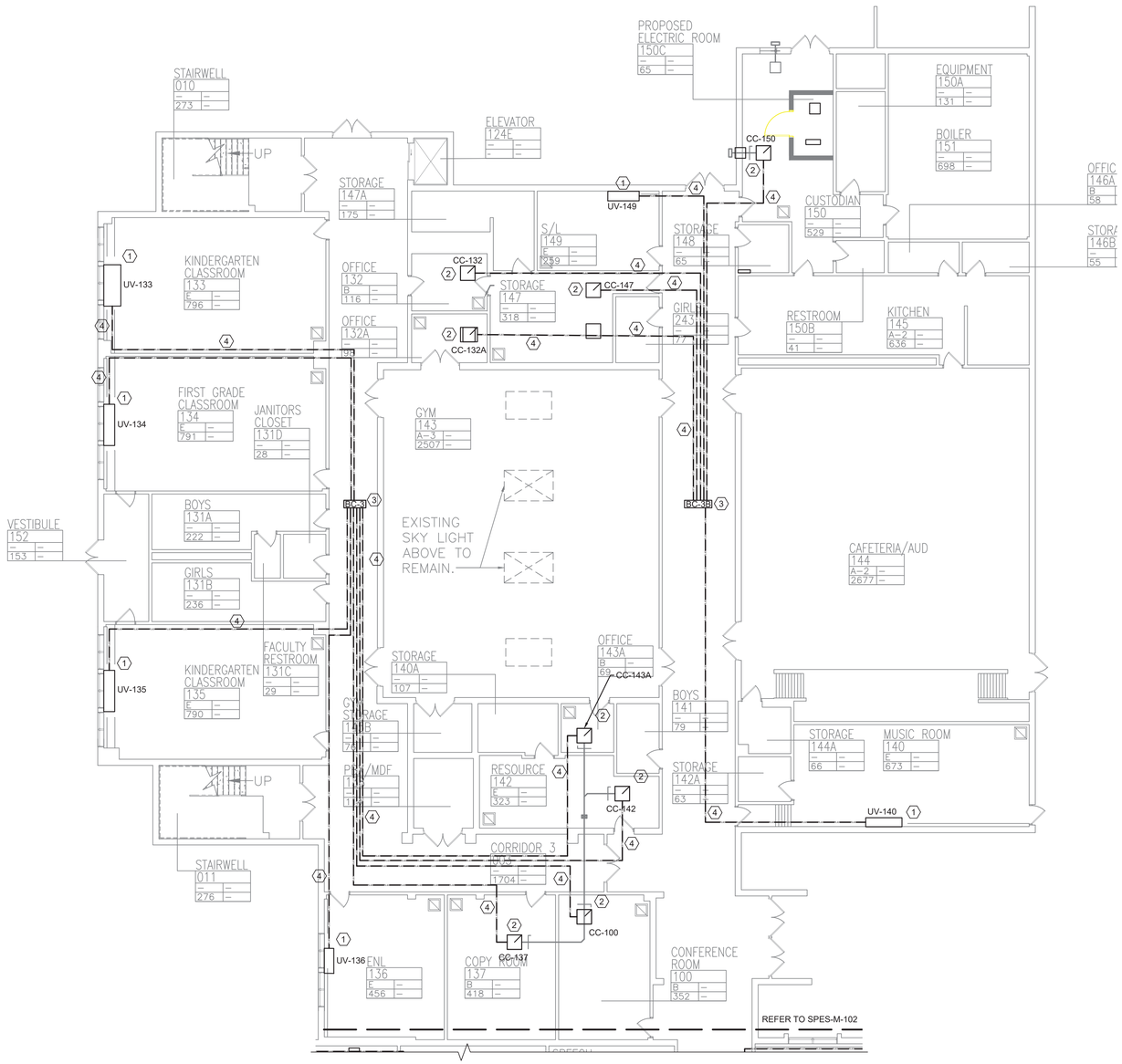
Drawing Title
FIRST FLOOR PART. PLAN - REFG. PIPING - 2

Drawing No.
SPES-M-107

KEYED NOTES:

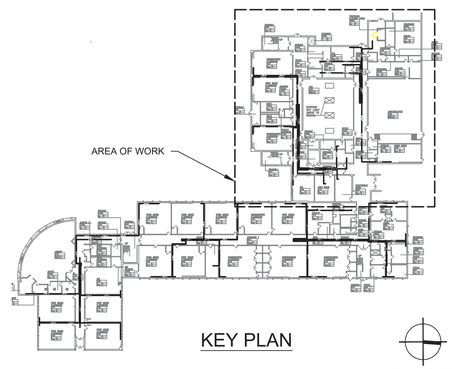
1. NEW UNIT VENTILATOR.
2. NEW CEILING CASSETTE.
3. INSTALL BRANCH CONTROLLER IN SUSPENDED CEILING. SEE DETAIL 5/M502.
4. INSTALL, ROUTE, AND CONNECT REFRIGERANT PIPING AS INDICATED ABOVE SUSPENDED CEILING. COORDINATE WITH ARCHITECT DRAWINGS .

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 MECHANICAL FIRST FLOOR PARTIAL PLAN - REFRIGERANT PIPING - 3

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by	VF/AW
Checked by	EF
Project No.	43040
Scale	AS NOTED
Date	03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. 18P2420000B.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-015
SED# 50-02-01-06-0-024-015

7 GUERNSEY DR
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

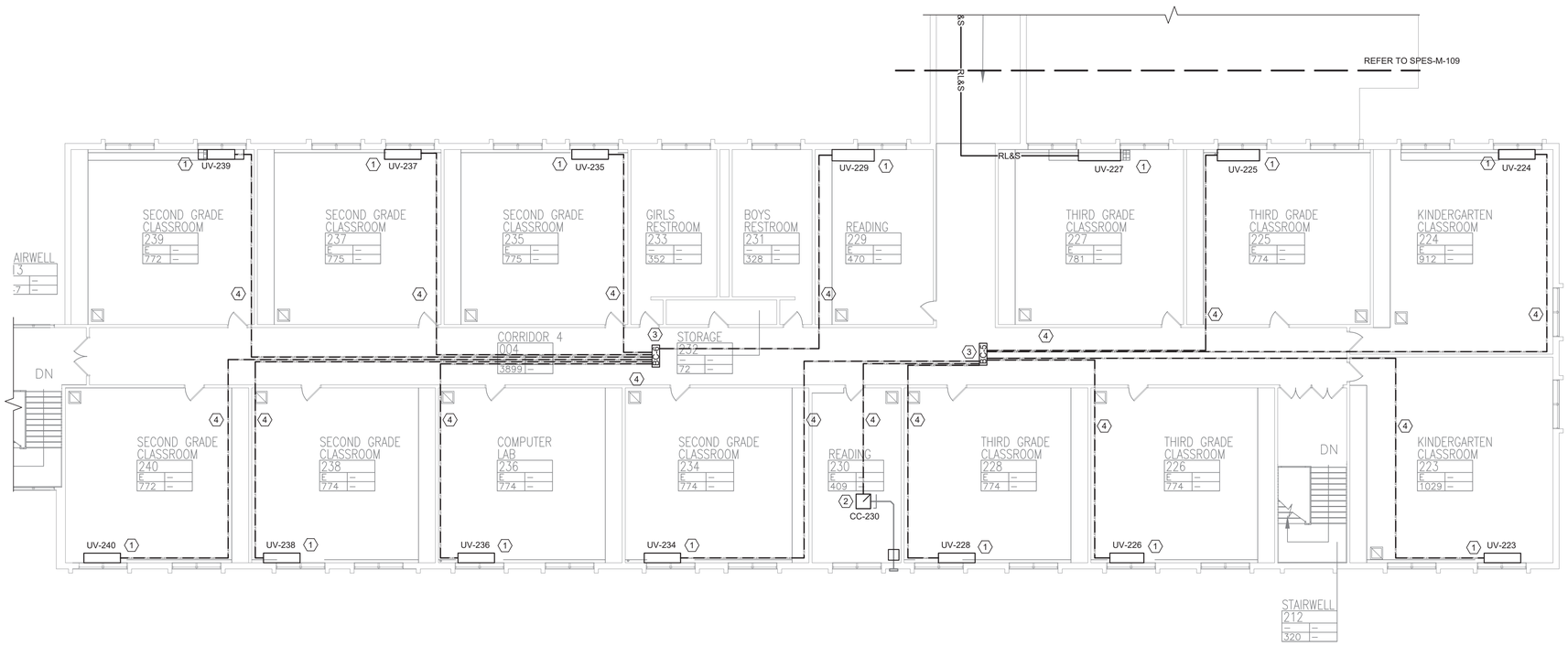
Drawing Title
FIRST FLOOR PART. PLAN - REFG. PIPING - 3

Drawing No.
SPES-M-108

KEYED NOTES:

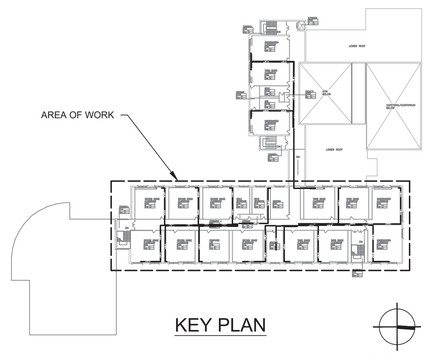
1. NEW UNIT VENTILATOR.
2. NEW CEILING CASSETTE.
3. INSTALL BRANCH CONTROLLER IN SUSPENDED CEILING. SEE DETAIL 5/M502.
4. INSTALL, ROUTE, AND CONNECT REFRIGERANT PIPING AS INDICATED ABOVE SUSPENDED CEILING. COORDINATE WITH ARCHITECT DRAWINGS .

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE



1 MECHANICAL SECOND FLOOR PARTIAL PLAN - REFRIGERANT PIPING - 1

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



No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1827250008.00
Mechanical & Electrical Engineer:

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-015
SED# 50-02-01-06-0-024-015

7 GURNEE DR
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

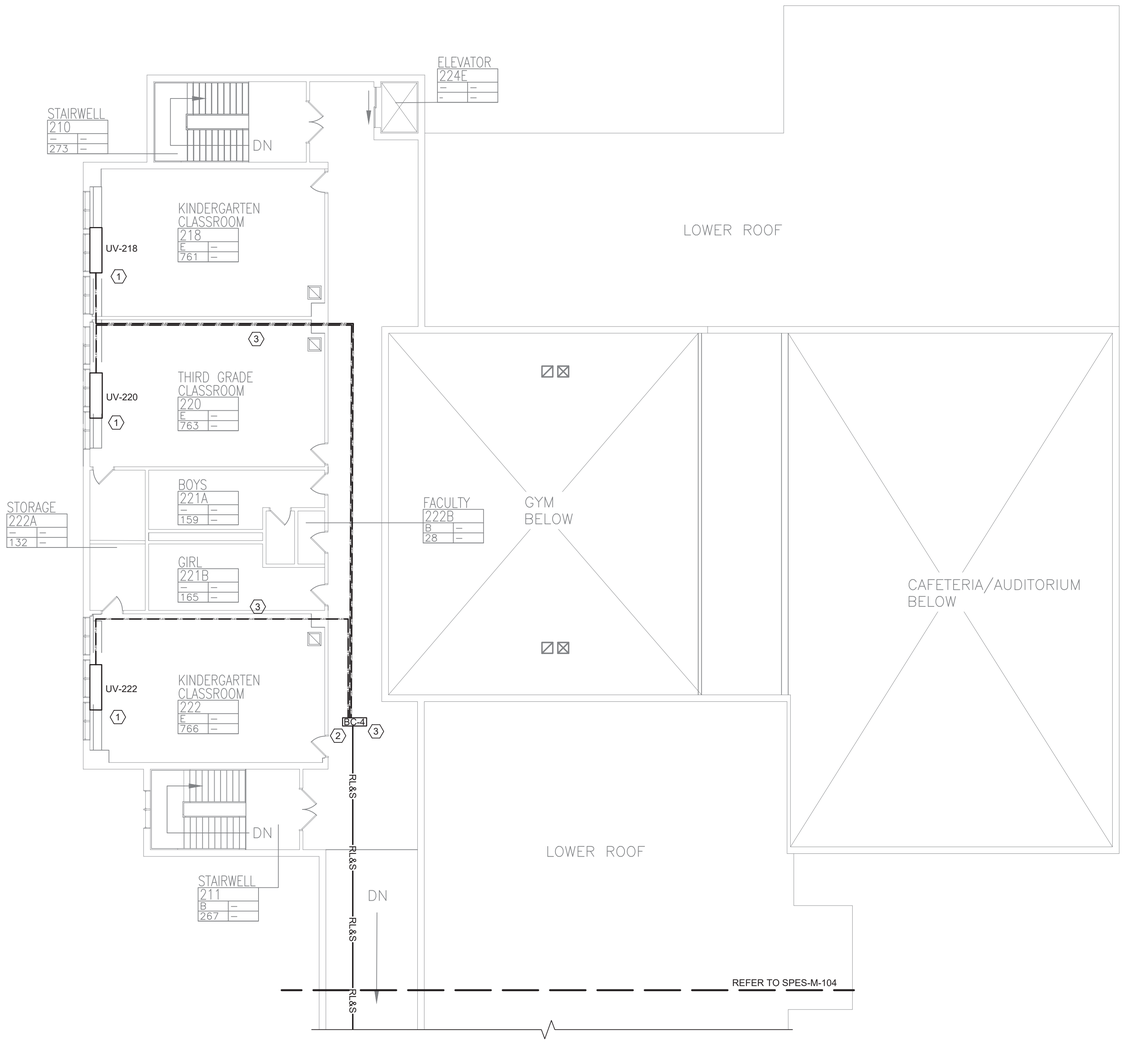
MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-768-9200
www.shilale.com

Drawing Title
SECOND FLOOR PART. PLAN - REFG. PIPING - 1

Drawing No.
SPES-M-109

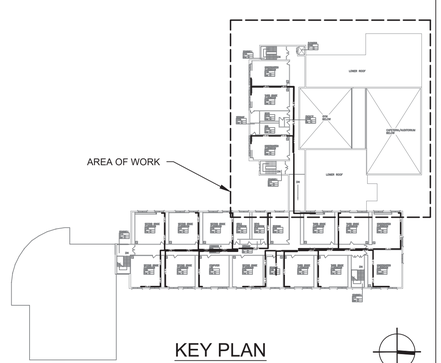
KEYED NOTES:

1. PROVIDE NEW UNIT VENTILATOR.
2. PROVIDE AND INSTALL BRANCH CONTROLLER IN SUSPENDED CEILING. SEE DETAIL 5/M502.
3. PROVIDE, INSTALL, ROUTE, AND CONNECT REFRIGERANT PIPING AS INDICATED ABOVE SUSPENDED CEILING.COORDINATE WITH ARCHITECT DRAWINGS .



1 MECHANICAL SECOND FLOOR PARTIAL PLAN - REFRIGERANT PIPING - 2

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



IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by	VF/AW
Checked by	EF
Project No.	4304O
Scale	AS NOTED
Date	03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. 1807230008.00

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015

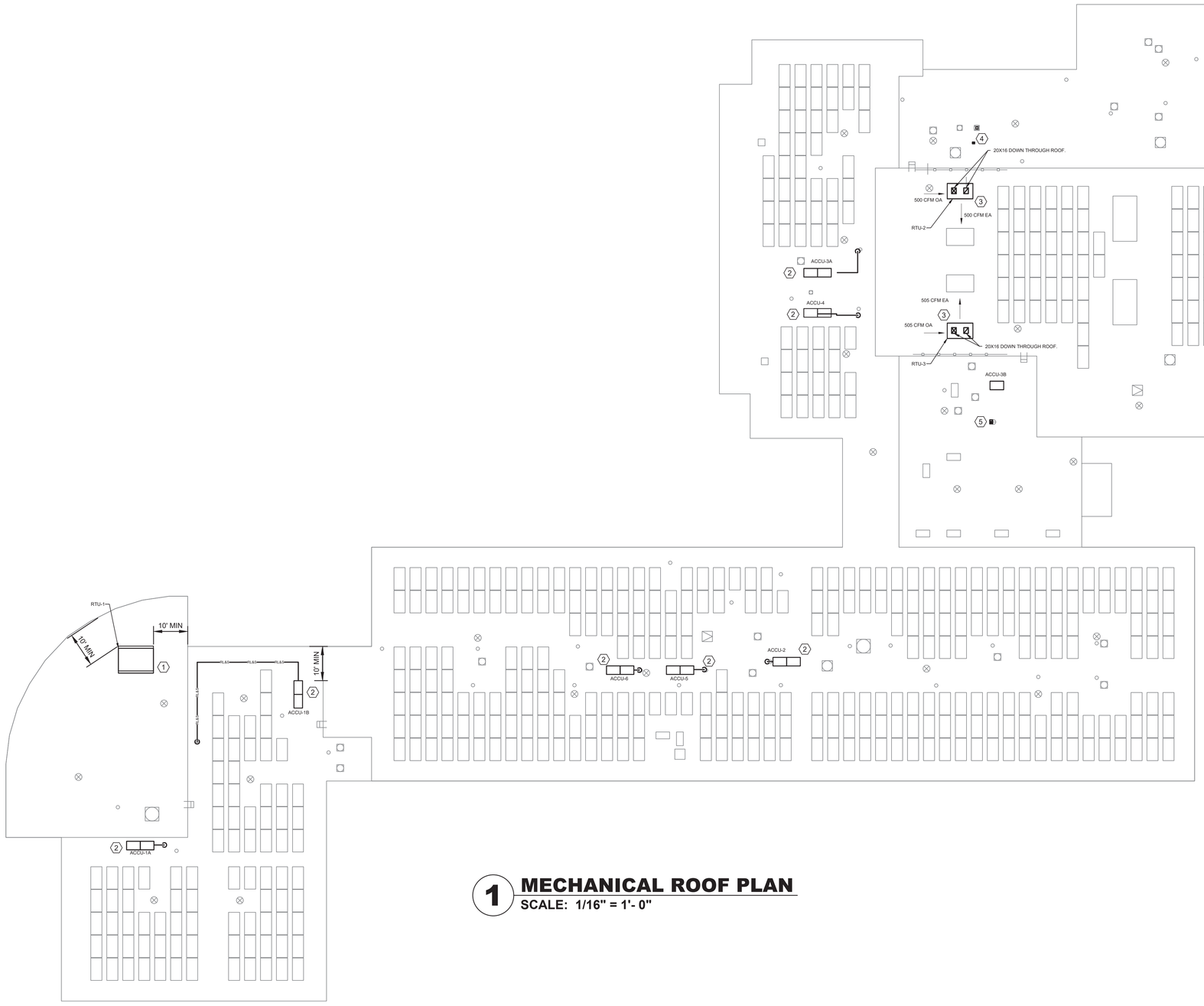
7 CUTHER DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
SECOND FLOOR PART. PLAN - REFG. PIPING - 2

Drawing No.
SPES-M-110



KEYED NOTES:

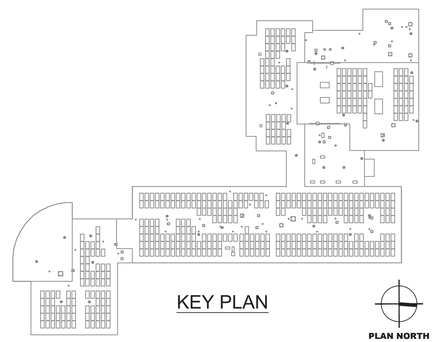
1. INSTALL NEW ROOF TOP UNIT. CONNECT TO NEW SUPPLY AND RETURN DUCTWORK. SEE 10/M501.
2. INSTALL AND CONNECT ACCU AS SHOWN. SEE STRUCTURAL DRAWINGS FOR COORDINATION AS REQUIRED. SEE DETAILS 1/M502, 2/M503, 3/M503, AND 4/M503.
3. INSTALL AND CONNECT NEW ROOF TOP UNIT. CONNECT TO NEW SUPPLY AND RETURN DUCTWORK. SEE 6/M504.
4. FURNISH & INSTALL GOOSENECK VENT INTAKE. 6X4 DUCTWORK TO FLOOR BELOW. SEE 4/502.
5. FURNISH & INSTALL GOOSENECK VENT INTAKE. 10X8 DUCTWORK TO FLOOR BELOW. SEE 4/502.

IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

0 1/2 1

1 MECHANICAL ROOF PLAN

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



KEY PLAN

PLAN NORTH

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

Mechanical & Electrical Engineer:
GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
PROJ. NO. 1NYC250008.00

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

UNIVENT REPLACEMENT AT STONY POINT, THIELLS, WEST HAVESTRAW ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-015
SED# 50-02-01-06-0-024-015

7 GUERNE DR
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
ROOF PLAN - MECHANICAL

Drawing No.
SPES-M-111

SEQUENCE OF OPERATIONS
UNIT VENTILATOR

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM-UP / PRE-COOL, OCCUPIED / UNOCCUPIED AND HEAT / COOL MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

OCCUPIED MODE:
DURING OCCUPIED PERIODS THE SUPPLY FAN WILL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER WILL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS. VRF HEATING/COOLING OR THE HOT WATER COIL VALVE WILL OPERATE TO MAINTAIN THE ACTIVE SPACE TEMPERATURE SETPOINT. VRF HEATING WILL OPERATE AS THE FIRST FORM OF HEAT. THE UNIT WILL UTILIZE HOT WATER HEAT AND FIN TUBE RADIATION IN CONDITIONS WHERE VRF HEAT IS NOT ABLE TO MEET THE HEATING DEMAND.

UNOCCUPIED MODE:
WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.), THE SUPPLY FAN WILL START, THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED AND HEATING WILL BE ENABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 2.0 DEG. F (ADJ.) THE SUPPLY FAN WILL STOP AND HEATING WILL BE DISABLED. WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.), THE SUPPLY FAN WILL START, THE OUTSIDE AIR DAMPER WILL OPEN IF ECONOMIZING IS ENABLED AND REMAIN CLOSED IF ECONOMIZING IS DISABLED AND COOLING WILL MODULATE TO MAINTAIN SPACE TEMPERATURE. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN WILL STOP, COOLING WILL BE DISABLED AND THE OUTSIDE AIR DAMPER WILL CLOSE.

OPTIMAL START:
THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.

MORNING WARM-UP MODE:
DURING OPTIMAL START, WHEN THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT, A MORNING WARM-UP MODE WILL BE ACTIVATED. WHEN MORNING WARM-UP IS INITIATED, THE UNIT WILL ENABLE THE HEATING AND SUPPLY FAN. THE OUTSIDE AIR DAMPER WIL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT WILL TRANSITION TO THE OCCUPIED MODE.

PRE-COOL MODE:
DURING OPTIMAL START, WHEN THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE WILL BE ACTIVATED. WHEN PRE-COOL IS INITIATED, THE UNIT WILL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT WILL TRANSITION TO THE OCCUPIED MODE.

OCCUPIED BYPASS:
THE BAS SHALL MONITOR THE STATUS OF THE "ON" AND "CANCEL" BUTTONS OF THE SPACE TEMPERATURE SENSOR OR MOVEMENT AS DETECTED BY A SPACE OCCUPANCY SENSOR. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).

SPACE TEMPERATURE CONTROL:
CASCADE ZONE CONTROL WILL BE USED IN THE OCCUPIED, OCCUPIED BYPASS, AND OCCUPIED STANDBY MODES. IT MAINTAINS ZONE TEMPERATURE BY CONTROLLING THE DISCHARGE AIR TEMPERATURE TO CONTROL THE ZONE TEMPERATURE WHILE MINIMIZING THE FAN SPEED. THE SPACE TEMPERATURE WILL BE MAINTAINED BETWEEN THE OCCUPIED COOLING SETPOINT OF 74.0 DEG. F (ADJ.) AND THE OCCUPIED HEATING SETPOINT OF 71.0 DEG. F (ADJ.). THE UNIT WILL TRANSITION TO THE COOLING MODE WHEN THE SPACE TEMPERATURE RISES ONE DEGREE ABOVE THE OCCUPIED COOLING SETPOINT OF 74.0 DEG. F (ADJ.). THE UNIT WILL TRANSITION TO THE HEATING MODE WHEN THE SPACE TEMPERATURE DROPS ONE DEGREE BELOW THE OCCUPIED HEATING SETPOINT OF 74.0 DEG. F (ADJ.).

ECONOMIZER CONTROL:
ECONOMIZING WILL BE ENABLED WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW THE ECONOMIZING ENABLE SETPOINT OF 65.0 DEG. F (ADJ.). ECONOMIZING WILL BE DISABLED WHEN THE OUTDOOR AIR TEMPERATURE IS GREATER THAN 5.0 DEG. F ABOVE THE ECONOMIZER ENABLE SETPOINT. WHEN ECONOMIZING IS ENABLED THE OUTSIDE AIR DAMPER WILL MODULATE BETWEEN THE MINIMUM DAMPER POSITION AND 100% OPEN TO MAINTAIN THE OCCUPIED COOLING SETPOINT. IF THE OUTDOOR AIR TEMPERATURE SENSOR FAILS, ECONOMIZING WILL BE DISABLED AND AN ALARM WILL BE ANNUNCIATED AT THE BAS.

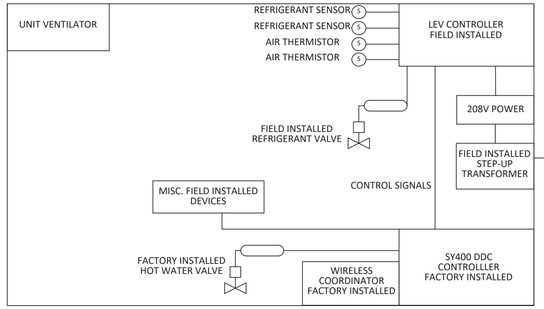
SUPPLY FAN OPERATION:
THE SUPPLY FAN SHALL CYCLE ON DEMAND DURING THE UNOCCUPIED MODE. WHEN THE CONTROLLER TRANSITIONS TO THE OCCUPIED MODE, THE SUPPLY FAN SHALL START AT HIGH SPEED BEFORE TRANSITIONING TO CONTINUOUS OPERATION AT THE SELECTED SPEED. THE SUPPLY FAN STATUS SHALL BE MONITORED BY A DIFFERENTIAL PRESSURE SWITCH. IF THE SUPPLY FAN FAILS THE FAN SHALL BE COMMANDED OFF AND AN ALARM WILL BE ANNUNCIATED AT THE BAS. A MANUAL RESET SHALL BE REQUIRED TO RESTART THE FAN.

FREEZE PROTECTION:
A HARDWIRED, LOW LIMIT TEMPERATURE SWITCH WILL BE ELECTRICALLY INTERLOCKED WITH THE SAFETY CIRCUIT. IF THE LOW LIMIT TEMPERATURE SWITCH IS TRIPPED 38.0 DEG. F (ADJ.), THE SUPPLY FAN WILL BE COMMANDED OFF, WATER VALVES WILL OPEN TO 100%, OUTSIDE AIR DAMPER WILL CLOSE, AND AN ALARM WILL BE ANNUNCIATED AT THE BAS.THE CONTROLLER WILL AUTOMATICALLY ATTEMPT TO RESTART THE UNIT AFTER 30 MINUTES. IF THE UNIT RESTARTS SUCCESSFULLY WITH NO LOW TEMPERATURE CONDITION, THE DIAGNOSTIC IS CLEARED. IF A SECOND LOW TEMPERATURE CONDITION OCCURS WITHIN A 24 HOUR PERIOD THE UNIT WILL BE LOCKED OUT UNTIL MANUALLY RESET.

FILTER TIMER:
THE FAN-RUN TIME (HRS) WILL BE COMPARED TO THE FILTER MAINTENANCE TIMER SETPOINT. ONCE THE SETPOINT IS REACHED A FILTER TIMER ALARM DIAGNOSTIC WILL BE ANNUNCIATED AT THE BAS. WHEN THE DIAGNOSTIC IS CLEARED, THE FILTER-MAINTENANCE TIMER IS RESET TO ZERO, AND THE TIMER BEGINS ACCUMULATING FAN-RUN TIME AGAIN.

FIN TUBE RADIATOR:
THE FIN TUBE RADIATOR WILL ACT AS SECOND STAGE OF HEAT.

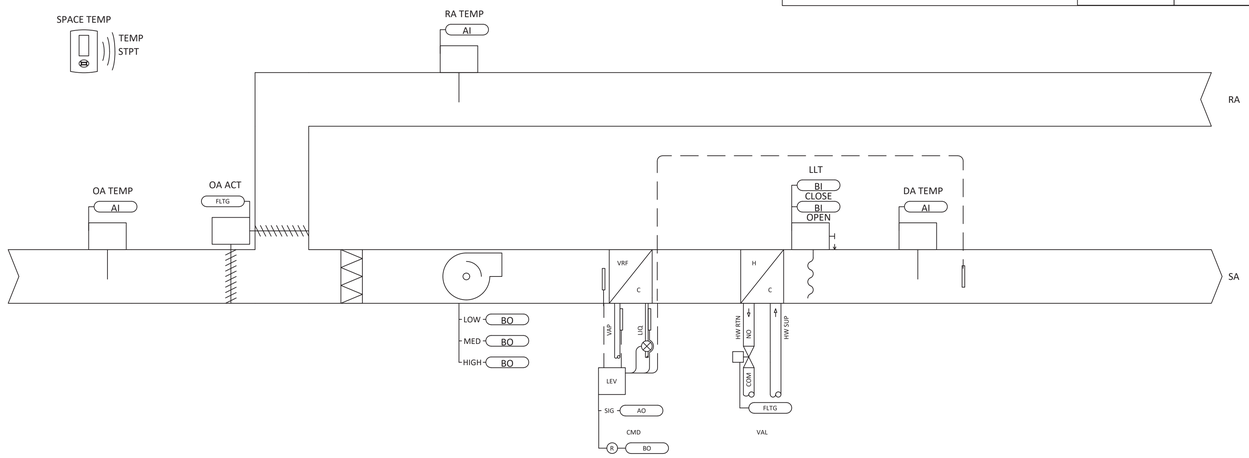
(UNIT VENTILATOR W/ VRF LEV)

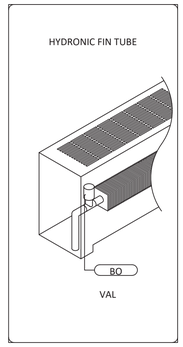


ALL ITEMS DENOTED AS FIELD INSTALLED ARE TO BE FIELD INSTALLED BY THE ATC CONTRACTOR. ATC CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER ON FURNISHING OF ITEMS

1/2" IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

UNIT VENTILATOR W/ VRF LEV





1 UNIT VENTILATOR FLOW DIAGRAM & SEQUENCE OF OPPERATIONS
SCALE: NONE

SEQUENCE OF OPERATIONS
VRF INDOOR UNITS

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) WILL SEND THE CONTROLLER OCCUPIED / UNOCCUPIED MODES AND SETPOINTS. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER WILL OPERATE USING DEFAULT MODES AND SETPOINTS .

OCCUPIED MODE:
DURING OCCUPIED PERIODS, THE SUPPLY FAN WILL RUN CONTINUOUSLY. VRF HEATING OR COOLING WILL MODULATE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.

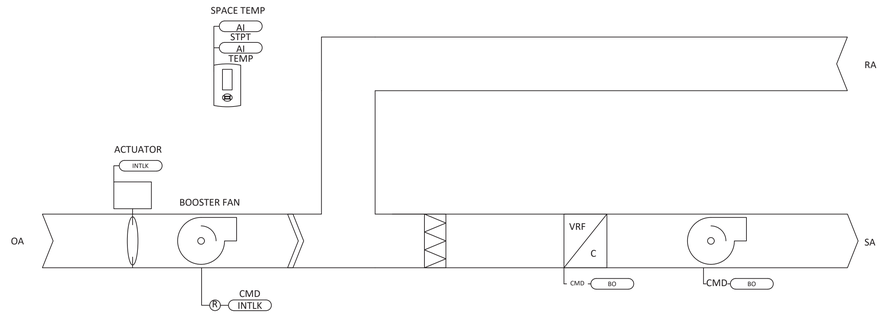
UNOCCUPIED MODE:
WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.), THE SUPPLY FAN WILL START AND VRF HEATING WILL BE ENABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE SUPPLY FAN WILL STOP AND THE VRF HEATING WILL BE DISABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.), THE SUPPLY FAN WILL START AND VRF COOLING WILL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE SUPPLY FAN WILL STOP AND THE VRF COOLING WILL BE DISABLED.

COOLING MODE:
THE UNIT CONTROLLER WILL USE SPACE TEMPERATURE AND SPACE TEMPERATURE SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR COOLING. WHEN THE SPACE TEMPERATURE RISES ABOVE THE SETPOINT, THE UNIT CONTROLLER WILL MODULATE VRF COOLING AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. ONCE THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT, VRF COOLING WILL BE DISABLED.

HEATING MODE:
THE UNIT CONTROLLER WILL USE SPACE TEMPERATURE AND SPACE TEMPERATURE SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR HEATING. WHEN THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT, THE UNIT CONTROLLER WILL MODULATE VRF HEATING AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. ONCE THE SPACE TEMPERATURE RISES ABOVE THE SETPOINT, VRF HEATING WILL BE DISABLED.

BOOSTER FAN:
THE BOOSTER FAN WILL BE INTERLOCKED WITH THE INDOOR UNIT. THE FAN WILL RUN WHEN THE UNIT SUPPLY FAN IS RUNNING.

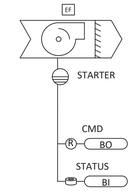
OUTDOOR AIR DAMPER:
THE OUTDOOR AIR DAMPER WILL BE INTERLOCKED WITH THE INDOOR UNIT. THE FAN WILL BE OPEN WHEN THE UNIT SUPPLY FAN IS RUNNING.



2 CEILING CASSETTE FLOW DIAGRAM & SEQUENCE OF OPPERATIONS
SCALE: NONE

SEQUENCE OF OPERATIONS
EXHAUST FANS

OCCUPANCY CONTROL:
THE EXHAUST FANS WILL BE ENABLED WHEN THE CONTROLLER IS IN THE OCCUPIED MODE AND DISABLED IN THE UNOCCUPIED MODE. THE BAS WILL MONITOR FAN STATUS FOR ALARMING PURPOSES.



3 EXHAUST FAN FLOW DIAGRAM & SEQUENCE OF OPERATIONS
SCALE: NONE

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
FED. ID NO. 13-3971250000.00
Mechanical & Electrical Engineer:

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL

SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-024-013
SED# 50-02-01-06-0-024-015

7 GURNEE DR.
STONY POINT, NY 10980

STONY POINT
ROCKLAND COUNTY

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

Drawing Title
FLOW DIAGRAM AND SEQUENCE OF OPERATIONS - 1

Drawing No.
SPES-M-301

SEQUENCE OF OPERATIONS
GYM FLOW

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARMUP, NIGHT PURGE, PRE-COOL, OCCUPIED / UNOCCUPIED AND HEAT / COOL MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS. THE BAS SHALL ALSO SEND THE CONTROLLER A RELATIVE HUMIDITY SETPOINT, AND DAMPER MINIMUM POSITION.

EMERGENCY STOP:
WHEN CONTACT CLOSURE AT TERMINALS TOAU-9 & 10 ARE OPEN, THE UNIT OPERATION SHALL BE IN ALARM STATUS AND AN ALARM SHALL BE GENERATED. UNIT SHALL REVERT TO NORMAL OPERATION UPON CLOSURE OF OAUTS 9 AND 10. IMPORTANT: CYCLING POWER TO UNIT MAY NOT RESOLVE ALARM CONDITION.

OCCUPIED START SEQUENCE:
POWERING UNIT INITIALIZES VIA A 3 -MINUTE PROCESS. OCCUPIED MODE SHALL ENABLE VIA BAS SIGNAL OR CONTACT CLOSURE ACROSS ENABLE TERMINALS ON CUSTOMER SUPPLIED FIELD WIRING TERMINAL BOARD. WHEN ENABLED IN THE OCCUPIED MODE, THE OUTDOOR AIR AND RETURN AIR DAMPER SHALL BE COMMANDED TO PRESET OCCUPIED POSITION.

OCCUPIED COOLING MODE ENABLE:
WHEN COOLING MODE IS ENABLED, THE UNIT USES THE EVAPORATOR COIL LEAVING AIR TEMPERATURE AND COOLING COIL LEAVING AIR TEMPERATURE SETPOINTS RESPECTIVELY.

OCCUPIED COOLING MODE:
ON A CALL FOR COOLING, THE COMPRESSOR(S) SHALL BE STAGED TO MAINTAIN THE ACTIVE COOL TEMPERATURE SETPOINT. TO PREVENT EXCESSIVE CYCLING, COMPRESSOR STAGING INCLUDES AN INTERSTAGE TIMER TO ALLOW AN ADDITIONAL COMPRESSOR TO START EVERY 3 MINUTES. DURING COOLING, THE COMPRESSOR STAGING CALCULATION MONITORS EVAPORATOR COIL LEAVING AIR TEMPERATURE AND COMPARES TO THE COOLING COIL LEAVING AIR TEMPERATURE SETPOINT. AS THE TEMPERATURE APPROACHES 52.0 DEG. F (ADJ.) LEAVING THE EVAPORATOR COIL, THE DEMAND FOR COOLING SHALL BE REDUCED. IF ECONOMIZING IS ENABLED THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.

OCCUPIED HEATING MODE:
DURING HEATING MODE, THE UNIT SHALL MODULATE THE HEATING OUTPUT TO MAINTAIN THE DISCHARGE AIR TEMPERATE AT THE DISCHARGE AIR SETPOINT ACTIVE.

OCCUPIED AUXILIARY HEAT MODE:
AUXILIARY HEATING MODE SHALL BE ENABLED IF THE COMPRESSOR HEAT IS NOT ABLE TO MAINTAIN SETPOINT FOR MORE THAN 10 MINUTES, OR IF THE OUTDOOR AIR TEMPERATURE IS BELOW THE HEAT PUMP OUTDOOR AIR TEMPERATURE DISABLE SETPOINT (0.0 DEG. F ADJ.).

DEMAND DEFROST CONTROL:
OUTDOOR COIL DEFROSTING OCCURS ONLY WHEN OPERATING IN DX HEATING MODE WITH OUTDOOR AMBIENT TEMPERATURE BELOW 52.0 DEG. F AND THE OUTDOOR COIL TEMPERATURE BELOW 35.0 DEG. F. AUXILIARY HEATING MODE SHALL DISABLE THE COMPRESSORS FROM RUNNING AND MODULATE THE HEATING OUTPUT TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE FIRST DEFROST CYCLE AFTER POWER-UP IS INITIATED BASED ON 30 MINUTES OPERATING TIME AT THE REQUIRED CONDITIONS. IF NO AUXILIARY HEAT IS PROVIDED, UNIT SHALL NOT DISABLE THE HEAT AND SHALL PROVIDE AS MUCH HEAT AS POSSIBLE. TWELVE MINUTES AFTER COMPLETION OF THE DEFROST CYCLE, THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR IS CALCULATED RESULTING IN A CLEAN COIL DELTA T (DT) AND IS USED AS AN INDICATOR OF UNIT PERFORMANCE AT DRY COIL CONDITIONS. AUXILIARY HEATING MODE SHALL BE DISABLED WHEN THE OAT RISES 5.0 DEG. F ABOVE THE TEMPERATURE THAT IT SWITCHED FROM DX HEATING TO AUXILIARY HEATING. OVER TIME, AS MOISTURE AND FROST ACCUMULATE ON THE COIL, THE COIL TEMPERATURE SHALL DROP, INCREASING THE TEMPERATURE DIFFERENCE. MAXIMUM DISCHARGE AIR HEATING TEMPERATURE IS ADJUSTABLE BUT CANNOT EXCEED 125.0 DEG. F. WHEN THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR REACHES 1.8 X DT, A DEFROST CYCLE IS INITIATED. WHILE DEFROSTING, THE REVERSING VALVE(S) ARE IN THE COOLING POSITION, OUTDOOR FAN(S) ARE OFF, OUTDOOR DAMPER CLOSES, RETURN DAMPER OPENS, THE SUPPLY FAN RUNS AT MINIMUM, AND THE COMPRESSOR(S) CONTINUE TO OPERATE. IF THE OPTIONAL RETURN DAMPER IS NOT INSTALLED, THE OUTDOOR DAMPER SHALL REMAIN OPEN. THE DEFROST CYCLE IS TERMINATED WHEN THE COIL TEMPERATURE RISES HIGH ENOUGH TO INDICATE THAT THE FROST HAS BEEN ELIMINATED. TERMINATION OF THE DEFROST CYCLE INCLUDES A "SOFT START" DELAY. AT THE END OF EACH DEFROST CYCLE, THE OUTDOOR FAN COMES ON 5 SECONDS BEFORE THE REVERSING VALVE IS DE-ENERGIZED TO REDUCE NOISE.

UNOCCUPIED START SEQUENCE:
WHEN UNOCCUPIED MODE ENABLED, THE OUTDOOR AIR DAMPER SHALL BE COMMANDED TO CLOSE AND RETURN DAMPERS TO OPEN; THE SUPPLY FAN SHALL BE COMMANDED TO START AND A PRESET SIGNAL OF 50% (50-100% ADJ.) IS SENT TO THE SUPPLY FAN VFD OR ECM. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN. IF THE SWITCH DOES NOT OPEN WITHIN 60 SECONDS (ADJ.) AFTER A REQUEST FOR FAN OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED AT THE BAS, THE UNIT SHALL STOP, REQUIRING A MANUAL RESET. ON UNITS EQUIPPED WITH MORE THAN TWO COMPRESSORS, ONLY STAGE 1 AND 2 ENABLED DURING UNOCCUPIED MODES.

UNOCCUPIED COOLING MODE:
DURING UNOCCUPIED COOLING MODE OUTDOOR AIR CONDITIONS ARE IGNORED AND ONLY SPACE TEMPERATURE USED IN CONTROL DECISIONS. UNOCCUPIED COOLING MODE INITIALIZED WHEN NO CALL FOR UNOCCUPIED DEHUMIDIFICATION OR UNOCCUPIED HEATING IS PRESENT AND THE ACTIVE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED SPACE COOLING SETPOINT (80 DEF F ADJ.). CONTROL SHALL REMAIN IN COOLING MODE UNTIL THE ACTIVE SPACE TEMPERATURE DROPS BELOW THE UNOCCUPIED COOLING SETPOINT MINUS THE UNOCCUPIED OFFSET.
NOTE: *IN UNOCCUPIED COOLING MODE, ONLY STAGES 1 AND 2 ARE ACTIVE STAGES. IF ECONOMIZING IS ENABLED THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.*

DEMAND DEFROST CONTROL:
OUTDOOR COIL DEFROSTING OCCURS ONLY WHEN OPERATING IN DX HEATING MODE WITH OUTDOOR AMBIENT TEMPERATURE BELOW 52.0 DEG. F AND THE OUTDOOR COIL TEMPERATURE BELOW 35.0 DEG. F. THE FIRST DEFROST CYCLE AFTER POWER-UP IS INITIATED BASED ON 30 MINUTES OPERATING TIME AT THE REQUIRED CONDITIONS. TWELVE MINUTES AFTER COMPLETION OF THE DEFROST CYCLE, THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR IS CALCULATED RESULTING IN A CLEAN COIL DELTA T (DT) AND IS USED AS AN INDICATOR OF UNIT PERFORMANCE AT DRY COIL CONDITIONS. OVER TIME, AS MOISTURE AND FROST ACCUMULATE ON THE COIL, THE COIL TEMPERATURE SHALL DROP, INCREASING THE TEMPERATURE DIFFERENCE. WHEN THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR REACHES 1.8 X DT, A DEFROST CYCLE IS INITIATED. WHILE DEFROSTING, THE REVERSING VALVE(S) ARE IN THE COOLING POSITION, OUTDOOR FAN(S) ARE OFF, OUTDOOR DAMPER CLOSES, RETURN DAMPER OPENS, THE SUPPLY FAN RUNS AT MINIMUM, AND THE COMPRESSOR(S) CONTINUE TO OPERATE. IF THE OPTIONAL RETURN DAMPER IS NOT INSTALLED, THE OUTDOOR DAMPER SHALL REMAIN OPEN. THE DEFROST CYCLE IS TERMINATED WHEN THE COIL TEMPERATURE RISES HIGH ENOUGH TO INDICATE THAT THE FROST HAS BEEN ELIMINATED. TERMINATION OF THE DEFROST CYCLE INCLUDES A "SOFT START" DELAY. AT THE END OF EACH DEFROST CYCLE, THE OUTDOOR FAN COMES ON 5 SECONDS BEFORE THE REVERSING VALVE IS DE-ENERGIZED TO REDUCE NOISE. ***PRE-COOL MODE:*** *DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.*

OPTIMAL STOP:
THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT.

OCCUPIED BYPASS:
THE BAS SHALL MONITOR THE STATUS OF THE "ON" AND "CANCEL" BUTTONS OF THE SPACE TEMPERATURE SENSOR. THE OCCUPANCY OVERRIDE BUTTON SHALL OVERRIDE OCCUPANCY REQUEST TO OCCUPIED MODE WHEN THE ON OR OCCUPIED *BUTTON IS PRESSED. WHEN THE OFF OR* UNOCCUPIED *BUTTON IS PRESSED THE UNIT SHALL RETURN TO USING OCCUPIED REQUEST TO DETERMINE OCCUPANCY OF THE UNIT. OCCUPIED BYPASS TIME (FIELD ADJUSTABLE) IS SET TO 120 MINUTES. WHEN A OCCUPIED BYPASS REQUEST IS RECEIVED FROM THE SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).*

DIGITAL COMPRESSORS: (OPTIONAL)
COOLING SHALL BE CONTROLLED AS DESCRIBED IN THE COOLING MODE AND DISCHARGE RESET, HOWEVER THE ANALOG OUTPUT SHALL BE SET TO A DIFFERENT RANGE.
UNOCCUPIED HEAT / COOL MODE ENABLE:
THE UNIT IGNORES THE OUTDOOR AIR CONDITIONS WHEN DETERMINING THE NIGHT HEAT/COOL MODE.

DISCHARGE AIR TEMPERATURE RESET CONTROL:
THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE SETPOINTS BASED ON THE HEATING OR COOLING MODE OF THE UNIT, BY RESETTING THE DISCHARGE AIR TEMPERATURE SETPOINT CALCULATED BY COMPARING THE ACTIVE SPACE TEMPERATURE AGAINST THE ACTIVE SPACE TEMPERATURE SETPOINT. THE BAS COMMUNICATED VALUE WILL TAKE PRIORITY OVER THE LOCALLY CALCULATED VALUE.

OCCUPIED DEHUMIDIFICATION:
DEHUMIDIFICATION MODE SHALL BE ENABLED WHEN NO CALL FOR HEATING MODE AND THE SPACE DEWPOINT OR OUTDOOR AIR DEWPOINT RISES ABOVE THE SPACE DEWPOINT SETPOINT OR THE OUTDOOR AIR DEWPOINT SETPOINT. DEHUMIDIFICATION SHALL REMAIN ACTIVE UNTIL THE OUTDOOR AIR DEWPOINT RISES ABOVE THE OUTDOOR AIR DEWPOINT SETPOINT BY 3.0 DEG. F, OR IF HEATING MODE IS ENABLED. COMPRESSOR CONTROL IS BASED ON EVAP LEAVING TEMPERATURE SETPOINT. IF EVAPORATOR LEAVING AIR TEMPERATURE IS ABOVE SETPOINT FIRST STAGE (COMPRESSOR 1) SHALL START. IF AFTER A 3-MINUTE MINIMUM DELAY THE EVAPORATOR LEAVING AIR TEMPERATURE IS STILL ABOVE SETPOINT, THE SECOND, THIRD, AND FOURTH STAGES (COMPRESSOR 2, 3, AND 4) SHALL BE STAGED ON SEQUENTIALLY FOLLOWING INDIVIDUAL 3-MINUTE MINIMUM DELAYS BETWEEN EACH CALL.

OCCUPIED HOT GAS REHEAT:
DURING THE DEHUMIDIFICATION CYCLE, THE HOT GAS REHEAT SHALL BE ENABLED AND SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR SETPOINT. AS THE EVAPORATOR LEAVING TEMPERATURE APPROACHES THE EVAPORATOR LEAVING TEMPERATURE SETPOINT, COMPRESSORS 4, 3, AND 2 SHALL BE STAGED OFF SEQUENTIALLY WITH A 5 MINUTE DELAY IN BETWEEN. THE HOT GAS REHEAT COIL SHALL UNDERGO A PURGE CYCLE EVERY 30 MINUTES FOR 3 MINUTES. AS THE EVAPORATOR LEAVING TEMPERATURE FALLS BELOW EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 1.0 DEG. F FOR 5 MINUTES, COOLING STAGE 1 WILL BE DISABLED. DURING THE PURGE CYCLE THE, HOT GAS REHEAT COIL IS BYPASSED 100%. SHOULD THE SPACE BEGIN TO BE OVER-COOLED, THE HGRH SHALL MODULATE TO MAINTAIN THE OCCUPIED COOLING SETPOINT. THE HEATING CYCLE IS DISABLED WHEN THE HOT GAS REHEAT CYCLE IS ENABLED.

OCCUPIED HOT GAS REHEAT PURGE:
FOLLOWING CONTINUOUS 30-MINUTE HOT GAS REHEAT OPERATION AT LESS THAN 100 PERCENT REHEAT CAPACITY A PURGE CYCLE SHALL BE INITIATED. DURING THE PURGE CYCLE, THE HOT GAS REHEAT SIGNAL IS SET AND HELD AT 100 PERCENT FOR A PERIOD OF 3 MINUTES. FOLLOWING THE PURGE CYCLE, NORMAL OPERATION RESUMES.

UNOCCUPIED DEHUMIDIFICATION:
UNOCCUPIED DEHUMIDIFICATION MODE SHALL BE ENABLED WHEN THE SPACE DEWPOINT IS GREATER THAN OR EQUAL TO THE UNOCCUPIED DEWPOINT SETPOINT AND NO CALL FOR UNOCCUPIED HEATING MODE. UNOCCUPIED DEHUMIDIFICATION SHALL REMAIN ACTIVE UNTIL THE SPACE DEWPOINT RISES ABOVE THE UNOCCUPIED DEWPOINT SETPOINT BY 2.0 DEG. F, OR IF UNOCCUPIED HEATING MODE IS ENABLED. WHEN UNOCCUPIED DEHUMIDIFICATION IS ENABLED, FIRST STAGE COOLING (COMPRESSOR 1) SHALL START. IF AFTER A 5-MINUTE DELAY IF THE EVAPORATOR LEAVING TEMPERATURE IS STILL HIGHER THAN THE EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 2.0 DEG. F AND (IF INSTALLED ON FIRST CIRCUIT) THE DIGITAL COMPRESSOR IS AT 100% CAPACITY, THE SECOND STAGE OF COOLING (COMPRESSOR 2) SHALL BE ENABLED WITH 5 MINUTES DELAY BETWEEN STAGES. WHEN EVAPORATOR LEAVING TEMPERATURE APPROACHES THE EVAPORATOR LEAVING TEMPERATURE SETPOINT, COMPRESSORS 2 SHALL BE STAGED OFF. AS THE EVAPORATOR LEAVING TEMPERATURE FALLS BELOW EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 1.0 DEG. F FOR 5 MINUTES, COOLING STAGE 1 SHALL BE DISABLED.

UNOCCUPIED HOT GAS REHEAT:
DURING THE UNOCCUPIED DEHUMIDIFICATION CYCLE, THE HOT GAS REHEAT SHALL BE ENABLED AND SHALL MODULATE TO MAINTAIN THE UNOCCUPIED DISCHARGE AIR SETPOINT.

UNOCCUPIED HOT GAS REHEAT PURGE:
FOLLOWING CONTINUOUS 30-MINUTE HOT GAS REHEAT OPERATION AT LESS THAN 100 PERCENT REHEAT CAPACITY A PURGE CYCLE SHALL BE INITIATED.

OCCUPIED ECONOMIZER:
ECONOMIZER IS FIELD ADJUSTABLE BETWEEN ENTHALPY OR DRY BULB WITH THE BINARY VALUE ECONOMIZER CONTROL TYPE (DEFAULTED FROM FACTORY AS ENTHALPY).

OCCUPIED VENTILATION MODE:
VENTILATION MODE IS ENABLED BASE ON SPACE TEMPERATURE AND OUTDOOR AIR TEMPERATURE. DRY BULB ECONOMIZER IS BASED ON OUTDOOR AIR TEMPERATURE AND RETURN AIR TEMPERATURE. OPERATION IN VENTILATION MODE IS ENABLED WHEN THE SPACE TEMPERATURE AND THE OUTDOOR AIR TEMPERATURE IS WITHIN 2.0 DEG. F OF THE OCCUPIED COOLING SETPOINT. ECONOMIZER MODE IS ENABLED WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW RETURN AIR TEMPERATURE AND CONTINUES UNTIL CONDITIONS CALL FOR DEHUMIDIFICATION OR WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE THE RETURN AIR TEMPERATURE BY 3.0 DEG. F. OPERATION IN VENTILATION MODE CONTINUES UNTIL CONDITIONS CALL FOR DEHUMIDIFICATION OR WHEN THE SPACE AND OUTDOOR AIR TEMPERATURE IS NOT WITHIN 2.0 DEG. F OF SETPOINT. WHEN THE OUTDOOR AIR TEMPERATURE IS MORE THAN 5.0 DEG. F BELOW THE EVAPORATOR LEAVING TEMPERATURE SETPOINT, THEN THE DX COOLING SHALL BE LOCKED OUT AND DAMPERS SHALL MODULATE TO MAINTAIN THE EVAPORATOR LEAVING TEMPERATURE SETPOINT. DURING VENTILATION MODE BOTH COOLING AND HEAT SHALL BE LOCKED OUT AND THE OUTDOOR AIR DAMPER SHALL MODULATE TO MAINTAIN THE OCCUPIED COOLING SETPOINT (IF EQUIPPED WITH OPTIONAL MODULATING DAMPERS). WHEN THE OUTDOOR AIR TEMPERATURE RISES ABOVE THE OCCUPIED EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 1.0 DEG. F, THE OUTDOOR AIR DAMPER SHALL OPEN TO THE MAXIMUM DAMPER POSITION AND ALLOW DX COOLING TO STAGE, AS NECESSARY. DURING ECONOMIZER MODE THE FAN SHALL MODULATE TO MAINTAIN THE OCCUPIED COOLING SETPOINT.

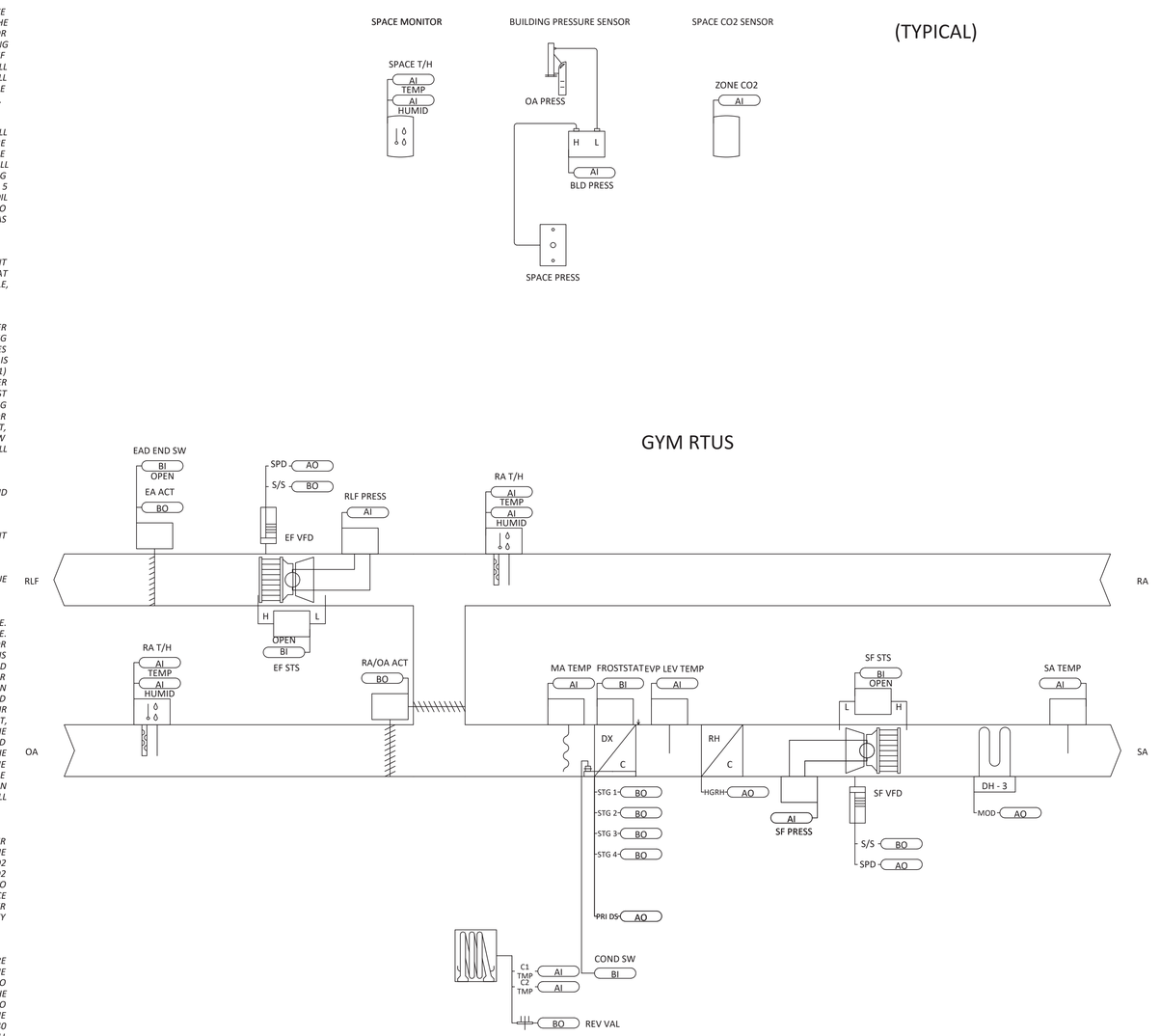
DEMAND CONTROL VENTILATION (DCV):
UNITS WITH SPACE CO2 SENSOR (FIELD SUPPLIED OR NETWORK COMMUNICATED) AND ECONOMIZER OPTIONS; THE UNIT CONTROLLER SHALL MONITOR SPACE CO2 LEVELS AND COMPARE THEM TO THE SPACE CO2 SETPOINT. WHEN THE SPACE CO2 LEVEL IS GREATER THAN OR EQUAL TO THE SPACE CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL OPEN AND MODULATE TO MAINTAIN THE SPACE CO2 LEVEL SETPOINT. ON A CALL FOR ECONOMIZER COOLING, THE DAMPER MAY BE OPENED FURTHER TO SATISFY THE COOLING REQUEST. WHEN THE SPACE CO2 LEVEL IS LESS THAN OR EQUAL TO THE SPACE CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL CLOSE TO THE MINIMUM OUTDOOR AIR DAMPER POSITION. ON A CALL FOR ECONOMIZER COOLING, THE DAMPER MAY BE MODULATED OPEN TO SATISFY THE COOLING REQUEST.

BUILDING PRESSURE CONTROL:
A DIFFERENTIAL PRESSURE TRANSDUCER SHALL ACTIVELY MONITOR THE DIFFERENCE IN PRESSURE BETWEEN THE BUILDING (INDOORS) AND OUTDOORS. IF THE BUILDING PRESSURE INCREASES ABOVE THE DESIRED SETPOINT, THE ASSOCIATED CONTROLLER SHALL MODULATE THE RELIEF FAN SPEED FASTER TO CONTROL BUILDING PRESSURE AT SETPOINT. IF THE BUILDING PRESSURE DECREASES BELOW THE DESIRED SETPOINT, THE ASSOCIATED CONTROLLER SHALL MODULATE THE RELIEF FAN SPEED SLOWER TO CONTROL BUILDING PRESSURE AT SETPOINT. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE RELIEF AIR FAN. IF THE SWITCH IS DETECTED TO BE OPEN FOR 40 CONSECUTIVE SECONDS AFTER A REQUEST FOR RELIEF FAN OPERATION A FAN FAILURE ALARM SHALL ANNUNCIATE AT THE BAS AND THE RELIEF FAN SHALL STOP. A MANUAL RESET SHALL BE REQUIRED.

EXHAUST FAN STATUS:
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN.

EXHAUST WITH GRAVITY DAMPERS:
IN THE OCCUPIED MODE AND AFTER INDOOR FAN STATUS HAS BEEN PROVEN, THE OUTDOOR AIR DAMPER STATUS IS OPEN, AND NO UNIT ALARMS, THE ISOLATION DAMPERS SHALL BE POWERED AND THE POWER EXHAUST FAN SPEED SHALL MODULATE TO MAINTAIN A CONSTANT VOLUME OF AIRFLOW. IF THE SWITCH IS DETECTED TO BE OPEN FOR 30 SECONDS (ADJ.) AFTER A REQUEST FOR EXHAUST FAN OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED AT THE BAS AND THE EXHAUST FAN SHALL STOP. DURING UNOCCUPIED MODE THE POWERED EXHAUST SHALL BE DISABLED. A MANUAL RESET SHALL BE REQUIRED.

FILTER STATUS:
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER. IF THE SWITCH CLOSES FOR 2 MINUTES DURING FAN OPERATION A FILTER MAINTENANCE ALARM SHALL BE ANNUNCIATED AT THE BAS.



1 GYM RTU FLOW DIAGRAM & SEQUENCE OF OPPERATIONS
SCALE: NONE

1/2 0 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale
Date 03-04-25

GREENMAN PEDERSEN, INC
2 BIZZONIA BOULEVARD
SUITE 302
SUFFERN, NY 10901
PROJ. NO. 1847250008.00
Mechanical & Electrical Engineer:

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

UNIVENT REPLACEMENT AT
STONY POINT, THIELLS,
WEST HAVESTRAW
ELEMENTARY SCHOOL
SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-018
SED# 50-02-01-06-0-024-015
7 GUINEA DR.
STONY POINT, NY 10980
STONY POINT
ROCKLAND COUNTY

MICHAEL SHILALE ARCHITECTS, L.L.P.
140 Park Avenue New City, NY 10956 Tel 845-708-8000
www.shilale.com

Drawing Title
FLOW DIAGRAM AND SEQUENCE OF OPPERATIONS - 2

Drawing No.
SPES-M-302

SEQUENCE OF OPERATIONS
LIBRARY RTU

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARMUP, NIGHT PURGE, PRE-COOL, OCCUPIED / UNOCCUPIED AND HEAT / COOL MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPPERATE USING DEFAULT MODES AND SETPOINTS. THE BAS SHALL ALSO SEND THE CONTROLLER A RELATIVE HUMIDITY SETPOINT, AND DAMPER MINIMUM POSITION.

EMERGENCY STOP:
WHEN CONTACT CLOSURE AT TERMINALS TOAU-9 & 10 ARE OPEN, THE UNIT OPERATION SHALL BE IN ALARM STATUS AND AN ALARM SHALL BE GENERATED. UNIT SHALL REVERT TO NORMAL OPERATION UPON CLOSURE OF DAUTS 9 AND 10. IMPORTANT: CYCLING POWER TO UNIT MAY NOT RESOLVE ALARM CONDITION.

OCCUPIED START SEQUENCE:
POWERING UNIT INITIALIZES VIA A 3 -MINUTE PROCESS. OCCUPIED MODE SHALL ENABLE VIA BAS SIGNAL OR CONTACT CLOSURE ACROSS ENABLE TERMINALS ON CUSTOMER SUPPLIED FIELD WIRING TERMINAL BOARD. WHEN ENABLED IN THE OCCUPIED MODE, THE OUTDOOR AIR AND RETURN AIR DAMPER SHALL BE COMMANDED TO PRESET OCCUPIED POSITION.

OCCUPIED COOLING MODE ENABLE:
WHEN COOLING MODE IS ENABLED, THE UNIT USES THE EVAPORATOR COIL LEAVING AIR TEMPERATURE AND COOLING COIL LEAVING AIR TEMPERATURE SETPOINTS RESPECTIVELY.

OCCUPIED COOLING MODE:
ON A CALL FOR COOLING, THE COMPRESSOR(S) SHALL BE STAGED TO MAINTAIN THE ACTIVE COOL TEMPERATURE SETPOINT. TO PREVENT EXCESSIVE CYCLING, COMPRESSOR STAGING INCLUDES AN INTERSTAGE TIMER TO ALLOW AN ADDITIONAL COMPRESSOR TO START EVERY 3 MINUTES. DURING COOLING, THE COMPRESSOR STAGING CALCUATION MONITORS EVAPORATOR COIL LEAVING AIR TEMPERATURE AND COMPARES TO THE COOLING COIL LEAVING AIR TEMPERATURE SETPOINT. AS THE TEMPERATURE APPROACHES 52.0 DEG. F (ADJ.) LEAVING THE EVAPORATOR COIL, THE DEMAND FOR COOLING SHALL BE REDUCED. IF ECONOMIZING IS ENABLED THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.

OCCUPIED HEATING MODE:
DURING HEATING MODE, THE UNIT SHALL MODULATE THE HEATING OUTPUT TO MAINTAIN THE DISCHARGE AIR TEMPERATE AT THE DISCHARGE AIR SETPOINT ACTIVE.

OCCUPIED AUXILIARY HEAT MODE:
AUXILIARY HEATING MODE SHALL BE ENABLED IF THE COMPRESSOR HEAT IS NOT ABLE TO MAINTAIN SETPOINT FOR MORE THAN 10 MINUTES, OR IF THE OUTDOOR AIR TEMPERATURE IS BELOW THE HEAT PUMP OUTDOOR AIR TEMPERATURE DISABLE SETPOINT (0.0 DEG. F ADJ.). THE UNIT SHALL USE THE INTERNAL HOT WATER HEATING COIL AS AUXILIARY HEAT.

DEMAND DEFROST CONTROL:
OUTDOOR COIL DEFROSTING OCCURS ONLY WHEN OPERATING IN DX HEATING MODE WITH OUTDOOR AMBIENT TEMPERATURE BELOW 52.0 DEG. F AND THE OUTDOOR COIL TEMPERATURE BELOW 35.0 DEG. F. AUXILIARY HEATING MODE SHALL DISABLE THE COMPRESSORS FROM RUNNING AND MODULATE THE HEATING OUTPUT TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE FIRST DEFROST CYCLE AFTER POWER-UP IS INITIATED BASED ON 30 MINUTES OPERATING TIME AT THE REQUIRED CONDITIONS. IF NO AUXILIARY HEAT IS PROVIDED, UNIT SHALL NOT DISABLE THE HEAT AND SHALL PROVIDE AS MUCH HEAT AS POSSIBLE. TWELVE MINUTES AFTER COMPLETION OF THE DEFROST CYCLE, THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR IS CALCULATED RESULTING IN A CLEAN COIL DELTA T (DT) AND IS USED AS AN INDICATOR OF UNIT PERFORMANCE AT DRY COIL CONDITIONS. AUXILIARY HEATING MODE SHALL BE DISABLED WHEN THE OAT RISES 5.0 DEG. F ABOVE THE TEMPERATURE THAT IT SWITCHED FROM DX HEATING TO AUXILIARY HEATING. OVER TIME, AS MOISTURE AND FROST ACCUMULATE ON THE COIL, THE COIL TEMPERATURE SHALL DROP, INCREASING THE TEMPERATURE DIFFERENCE. MAXIMUM DISCHARGE AIR HEATING TEMPERATURE IS ADJUSTABLE BUT CANNOT EXCEED 125.0 DEG. F. WHEN THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR REACHES 1.8 X DT, A DEFROST CYCLE IS INITIATED. WHILE DEFROSTING, THE REVERSING VALVE(S) ARE IN THE COOLING POSITION, OUTDOOR FAN(S) ARE OFF, OUTDOOR DAMPER CLOSES, RETURN DAMPER OPENS, THE SUPPLY FAN RUNS AT MINIMUM, AND THE COMPRESSOR(S) CONTINUE TO OPERATE. IF THE OPTIONAL RETURN DAMPER IS NOT INSTALLED, THE OUTDOOR DAMPER SHALL REMAIN OPEN. THE DEFROST CYCLE IS TERMINATED WHEN THE COIL TEMPERATURE RISES HIGH ENOUGH TO INDICATE THAT THE FROST HAS BEEN ELIMINATED. TERMINATION OF THE DEFROST CYCLE INCLUDES A "SOFT START" DELAY. AT THE END OF EACH DEFROST CYCLE, THE OUTDOOR FAN COMES ON 5 SECONDS BEFORE THE REVERSING VALVE IS DE-ENERGIZED TO REDUCE NOISE.

UNOCCUPIED START SEQUENCE:
WHEN UNOCCUPIED MODE ENABLED, THE OUTDOOR AIR DAMPER SHALL BE COMMANDED TO CLOSE AND RETURN DAMPERS TO OPEN; THE SUPPLY FAN SHALL BE COMMANDED TO START AND A PRESET SIGNAL OF 50% (50-100% ADJ.) IS SENT TO THE SUPPLY FAN VFD OR ECM. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN. IF THE SWITCH DOES NOT OPEN WITHIN 60 SECONDS (ADJ.) AFTER A REQUEST FOR FAN OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED AT THE BAS, THE UNIT SHALL STOP, REQUIRING A MANUAL RESET. ON UNITS EQUIPPED WITH MORE THAN TWO COMPRESSORS, ONLY STAGE 1 AND 2 ENABLED DURING UNOCCUPIED MODES.

UNOCCUPIED COOLING MODE:
DURING UNOCCUPIED COOLING MODE OUTDOOR AIR CONDITIONS ARE IGNORED AND ONLY SPACE TEMPERATURE USED IN CONTROL DECISIONS. UNOCCUPIED COOLING MODE INITIALIZED WHEN NO CALL FOR UNOCCUPIED DEHUMIDIFICATION OR UNOCCUPIED HEATING IS PRESENT AND THE ACTIVE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED SPACE COOLING SETPOINT (80 DEF F ADJ.). CONTROL SHALL REMAIN IN COOLING MODE UNTIL THE ACTIVE SPACE TEMPERATURE DROPS BELOW THE UNOCCUPIED COOLING SETPOINT MINUS THE UNOCCUPIED OFFSET. **NOTE:** IN UNOCCUPIED COOLING MODE, ONLY STAGES 1 AND 2 ARE ACTIVE STAGES. IF ECONOMIZING IS ENABLED THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.

DEMAND DEFROST CONTROL:
OUTDOOR COIL DEFROSTING OCCURS ONLY WHEN OPERATING IN DX HEATING MODE WITH OUTDOOR
AMBIENT TEMPERATURE BELOW 52.0 DEG. F AND THE OUTDOOR COIL TEMPERATURE BELOW 35.0 DEG. F. THE FIRST DEFROST CYCLE AFTER POWER-UP IS INITIATED BASED ON 30 MINUTES OPERATING
TIME AT THE REQUIRED CONDITIONS. TWELVE MINUTES AFTER COMPLETION OF THE DEFROST CYCLE, THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR IS CALCULATED RESULTING IN A CLEAN COIL DELTA T (DT) AND IS USED AS AN INDICATOR OF UNIT PERFORMANCE AT
DRY COIL CONDITIONS. OVER TIME, AS MOISTURE AND FROST ACCUMULATE ON THE COIL, THE COIL TEMPERATURE SHALL DROP, INCREASING THE TEMPERATURE DIFFERENCE. WHEN THE TEMPERATURE DIFFERENCE BETWEEN THE OUTDOOR COIL AND OUTDOOR AIR REACHES 1.8 X DT, A DEFROST CYCLE IS INITIATED. WHILE DEFROSTING, THE REVERSING VALVE(S) ARE IN THE COOLING POSITION, OUTDOOR FAN(S) ARE OFF, OUTDOOR DAMPER CLOSES, RETURN DAMPER OPENS, THE SUPPLY FAN RUNS AT MINIMUM, AND THE COMPRESSOR(S) CONTINUE TO OPERATE. IF THE OPTIONAL RETURN DAMPER IS NOT INSTALLED, THE OUTDOOR DAMPER SHALL REMAIN OPEN. THE DEFROST CYCLE IS TERMINATED WHEN THE COIL TEMPERATURE RISES HIGH ENOUGH TO INDICATE THAT THE FROST HAS BEEN ELIMINATED. TERMINATION OF THE DEFROST CYCLE INCLUDES A "SOFT START" DELAY. AT THE END OF EACH DEFROST CYCLE, THE OUTDOOR FAN COMES ON 5 SECONDS BEFORE THE REVERSING VALVE IS DE-ENERGIZED TO REDUCE NOISE.

PRE-COOL MODE:
DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

OPTIMAL STOP:
THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT.

OCCUPIED BYPASS:
THE BAS SHALL MONITOR THE STATUS OF THE "ON" AND "CANCEL" BUTTONS OF THE SPACE TEMPERATURE SENSOR. THE OCCUPANCY OVERRIDE BUTTON SHALL OVERRIDE OCCUPANCY REQUEST TO OCCUPIED MODE WHEN THE ON OR OCCUPIED *BUTTON IS PRESSED. WHEN THE OFF OR* UNOCCUPIED *BUTTON IS PRESSED THE UNIT SHALL RETURN TO USING OCCUPIED REQUEST TO DETERMINE OCCUPANCY OF THE UNIT. OCCUPIED BYPASS TIME (FIELD ADJUSTABLE) IS SET TO 120 MINUTES. WHEN A OCCUPIED BYPASS REQUEST IS RECEIVED FROM THE SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).*

DIGITAL COMPRESSORS: (OPTIONAL)
COOLING SHALL BE CONTROLLED AS DESCRIBED IN THE COOLING MODE AND DISCHARGE RESET, HOWEVER THE ANALOG OUTPUT SHALL BE SET TO A DIFFERENT RANGE.

UNOCCUPIED HEAT / COOL MODE ENABLE:
THE UNIT IGNORES THE OUTDOOR AIR CONDITIONS WHEN DETERMINING THE NIGHT HEAT/COOL MODE.

DISCHARGE AIR TEMPERATURE RESET CONTROL:
THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE SETPOINTS BASED ON THE HEATING OR COOLING MODE OF THE UNIT, BY RESETTING THE DISCHARGE AIR TEMPERATURE SETPOINT CALCULATED BY COMPARING THE ACTIVE SPACE TEMPERATURE AGAINST THE ACTIVE SPACE TEMPERATURE SETPOINT. THE BAS COMMUNICATED VALUE WILL TAKE PRIORITY OVER THE LOCALLY CALCULATED VALUE.

OCCUPIED DEHUMIDIFICATION:
DEHUMIDIFICATION MODE SHALL BE ENABLED WHEN NO CALL FOR HEATING MODE AND THE SPACE DEWPOINT OR OUTDOOR AIR DEWPOINT RISES ABOVE THE SPACE DEWPOINT SETPOINT OR THE OUTDOOR AIR DEWPOINT SETPOINT. DEHUMIDIFICATION SHALL REMAIN ACTIVE UNTIL THE OUTDOOR AIR DEWPOINT RISES ABOVE THE OUTDOOR AIR DEWPOINT SETPOINT BY 3.0 DEG. F, OR IF HEATING
MODE IS ENABLED. COMPRESSOR CONTROL IS BASED ON EVAP LEAVING TEMPERATURE SETPOINT. IF EVAPORATOR LEAVING AIR TEMPERATURE IS ABOVE SETPOINT FIRST STAGE (COMPRESSOR 1) SHALL START. IF AFTER A 3-MINUTE MINIMUM DELAY THE EVAPORATOR LEAVING AIR TEMPERATURE IS STILL ABOVE SETPOINT, THE SECOND, THIRD, AND FOURTH STAGES (COMPRESSOR 2, 3, AND 4) SHALL BE STAGED ON SEQUENTIALLY FOLLOWING INDIVIDUAL 3-MINUTE MINIMUM DELAYS BETWEEN EACH CALL.

OCCUPIED HOT GAS REHEAT:
DURING THE DEHUMIDIFICATION CYCLE, THE HOT GAS REHEAT SHALL BE ENABLED AND SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR SETPOINT. AS THE EVAPORATOR LEAVING TEMPERATURE APPROACHES THE EVAPORATOR LEAVING TEMPERATURE SETPOINT, COMPRESSORS 4, 3, AND 2 SHALL BE STAGED OFF SEQUENTIALLY WITH A 5 MINUTE DELAY IN BETWEEN. THE HOT GAS REHEAT COIL SHALL UNDERGO A PURGE CYCLE EVERY 30 MINUTES FOR 3 MINUTES. AS THE EVAPORATOR LEAVING TEMPERATURE FALLS BELOW EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 1.0 DEG. F FOR 5 MINUTES, COOLING STAGE 1 WILL BE DISABLED. DURING THE PURGE CYCLE THE, HOT GAS REHEAT COIL IS BYPASSED 100%. SHOULD THE SPACE BEGIN TO BE OVER-COOLED, THE HGRH SHALL MODULATE TO MAINTAIN THE OCCUPIED COOLING SETPOINT. THE HEATING CYCLE IS DISABLED WHEN THE HOT GAS REHEAT CYCLE IS ENABLED.

OCCUPIED HOT GAS REHEAT PURGE:
FOLLOWING CONTINUOUS 30-MINUTE HOT GAS REHEAT OPERATION AT LESS THAN 100 PERCENT REHEAT CAPACITY A PURGE CYCLE SHALL BE INITIATED. DURING THE PURGE CYCLE, THE HOT GAS REHEAT SIGNAL IS SET AND HELD AT 100 PERCENT FOR A PERIOD OF 3 MINUTES. FOLLOWING THE PURGE CYCLE, NORMAL OPERATION RESUMES.

UNOCCUPIED DEHUMIDIFICATION:
UNOCCUPIED DEHUMIDIFICATION MODE SHALL BE ENABLED WHEN THE SPACE DEWPOINT IS GREATER THAN OR EQUAL TO THE UNOCCUPIED DEWPOINT SETPOINT AND NO CALL FOR UNOCCUPIED HEATING MODE. UNOCCUPIED DEHUMIDIFICATION SHALL REMAIN ACTIVE UNTIL THE SPACE DEWPOINT RISES ABOVE THE UNOCCUPIED DEWPOINT SETPOINT BY 2.0 DEG. F, OR IF UNOCCUPIED HEATING MODE IS ENABLED. WHEN UNOCCUPIED DEHUMIDIFICATION IS ENABLED, FIRST STAGE COOLING (COMPRESSOR 1) SHALL START. IF AFTER A 5-MINUTE DELAY IF THE EVAPORATOR LEAVING TEMPERATURE IS STILL HIGHER THAN THE EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 2.0 DEG. F AND (IF INSTALLED ON FIRST CIRCUIT) THE DIGITAL COMPRESSOR IS AT 100% CAPACITY, THE SECOND STAGE OF COOLING

(COMPRESSOR 2) SHALL BE ENABLED WITH 5 MINUTES DELAY BETWEEN STAGES. WHEN EVAPORATOR LEAVING TEMPERATURE APPROACHES THE EVAPORATOR LEAVING TEMPERATURE SETPOINT, COMPRESSORS 2 SHALL BE STAGED OFF. AS THE EVAPORATOR LEAVING TEMPERATURE FALLS BELOW EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 1.0 DEG. F FOR 5 MINUTES, COOLING STAGE 1 SHALL BE DISABLED.

UNOCCUPIED HOT GAS REHEAT:
DURING THE UNOCCUPIED DEHUMIDIFICATION CYCLE, THE HOT GAS REHEAT SHALL BE ENABLED AND SHALL MODULATE TO MAINTAIN THE UNOCCUPIED DISCHARGE AIR SETPOINT.

UNOCCUPIED HOT GAS REHEAT PURGE:
FOLLOWING CONTINUOUS 30-MINUTE HOT GAS REHEAT OPERATION AT LESS THAN 100 PERCENT REHEAT CAPACITY A PURGE CYCLE SHALL BE INITIATED.

OCCUPIED ECONOMIZER:
ECONOMIZER IS FIELD ADJUSTABLE BETWEEN ENTHALPY OR DRY BULB WITH THE BINARY VALUE ECONOMIZER CONTROL TYPE (DEFAULTED FROM FACTORY AS ENTHALPY).

OCCUPIED VENTILATION MODE:
VENTILATION MODE IS ENABLED BASE ON SPACE TEMPERATURE AND OUTDOOR AIR TEMPERATURE. DRY BULB ECONOMIZER IS BASED ON OUTDOOR AIR TEMPERATURE AND RETURN AIR TEMPERATURE. OPERATION IN VENTILATION MODE IS ENABLED
WHEN THE SPACE TEMPERATURE AND THE OUTDOOR AIR TEMPERATURE IS WITHIN 2.0 DEG. F OF THE OCCUPIED COOLING SETPOINT. ECONOMIZER MODE IS ENABLED WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW RETURN AIR
TEMPERATURE AND CONTINUES UNTIL CONDITIONS CALL FOR DEHUMIDIFICATION OR WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE THE RETURN AIR TEMPERATURE BY 3.0 DEG. F. OPERATION IN VENTILATION MODE CONTINUES UNTIL CONDITIONS CALL FOR DEHUMIDIFICATION OR WHEN THE SPACE AND OUTDOOR AIR TEMPERATURE IS NOT WITHIN 2.0 DEG. F OF SETPOINT. WHEN THE OUTDOOR AIR TEMPERATURE IS MORE THAN 5.0 DEG. F BELOW THE EVAPORATOR LEAVING TEMPERATURE SETPOINT, THEN THE DX COOLING SHALL BE LOCKED OUT AND DAMPERS SHALL MODULATE TO MAINTAIN THE EVAPORATOR LEAVING TEMPERATURE SETPOINT.

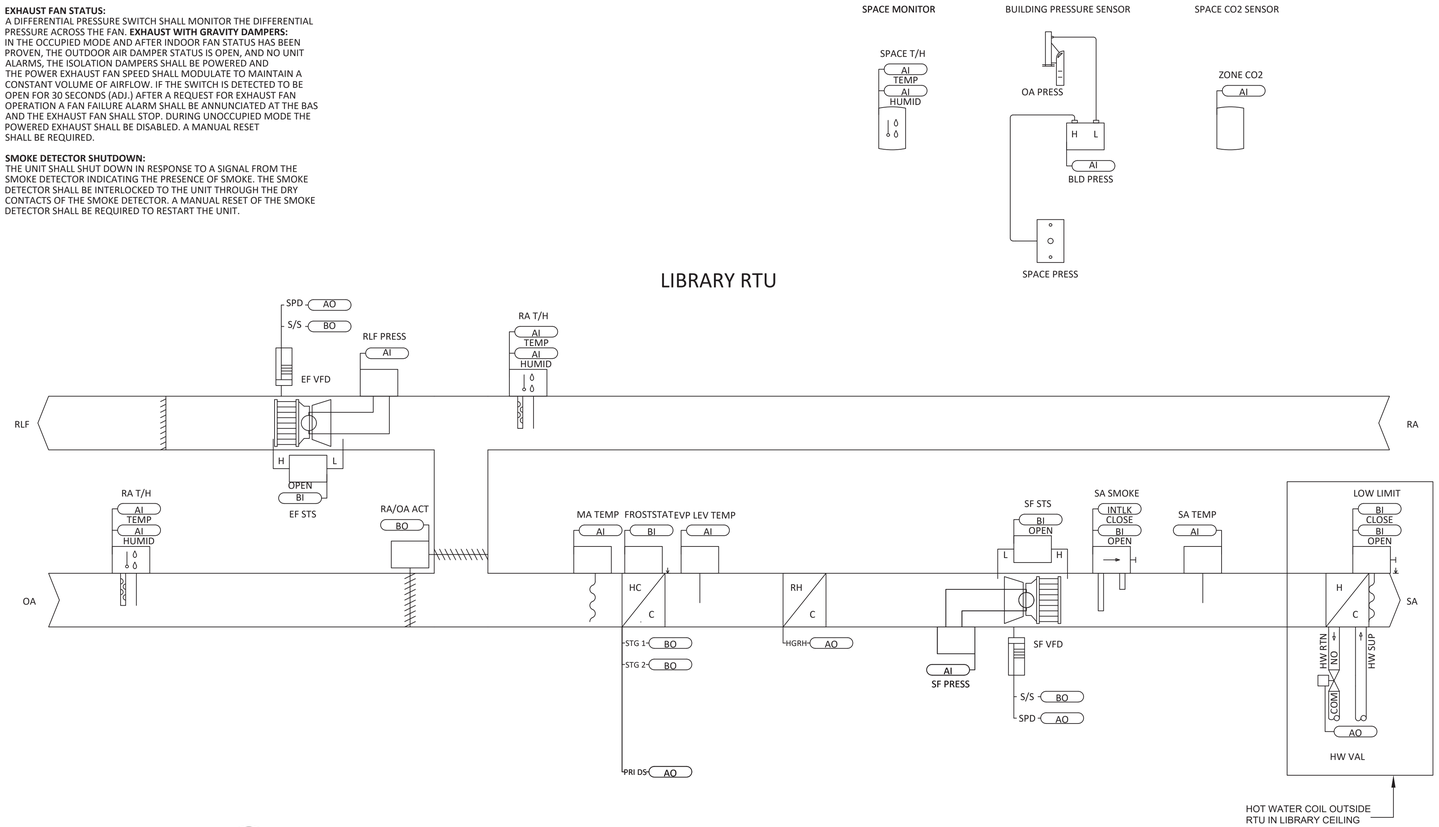
DURING VENTILATION MODE BOTH COOLING AND HEAT SHALL BE LOCKED OUT AND THE OUTDOOR AIR DAMPER SHALL MODULATE TO MAINTAIN THE OCCUPIED COOLING SETPOINT (IF EQUIPPED WITH OPTIONAL MODULATING DAMPERS). WHEN THE OUTDOOR AIR TEMPERATURE RISES ABOVE THE OCCUPIED EVAPORATOR LEAVING TEMPERATURE SETPOINT BY 1.0 DEG. F, THE OUTDOOR AIR DAMPER SHALL OPEN TO THE MAXIMUM DAMPER POSITION AND ALLOW DX COOLING TO STAGE, AS NECESSARY. DURING ECONOMIZER MODE THE FAN SHALL MODULATE TO MAINTAIN THE OCCUPIED COOLING SETPOINT.

DEMAND CONTROL VENTILATION (DCV):
UNITS WITH SPACE CO2 SENSOR (FIELD SUPPLIED OR NETWORK COMMUNICATED) AND ECONOMIZER OPTIONS; THE UNIT CONTROLLER SHALL MONITOR SPACE CO2 LEVELS AND COMPARE THEM TO THE SPACE CO2 SETPOINT. WHEN THE SPACE CO2 LEVEL IS GREATER THAN OR EQUAL TO THE SPACE CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL OPEN AND MODULATE TO MAINTAIN THE SPACE CO2 LEVEL SETPOINT. ON A CALL FOR ECONOMIZER COOLING, THE DAMPER MAY BE OPENED FURTHER TO SATISFY THE COOLING REQUEST. WHEN THE SPACE CO2 LEVEL IS LESS THAN OR EQUAL TO THE SPACE CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL CLOSE TO THE MINIMUM OUTDOOR AIR DAMPER POSITION. ON A CALL FOR ECONOMIZER COOLING, THE DAMPER MAY BE MODULATED OPEN TO SATISFY THE COOLING REQUEST.

BUILDING PRESSURE CONTROL:
A DIFFERENTIAL PRESSURE TRANSDUCER SHALL ACTIVELY MONITOR THE DIFFERENCE IN PRESSURE BETWEEN THE BUILDING (INDOORS) AND OUTDOORS. IF THE BUILDING PRESSURE INCREASES ABOVE THE DESIRED SETPOINT, THE ASSOCIATED CONTROLLER SHALL MODULATE THE RELIEF FAN SPEED FASTER TO CONTROL BUILDING PRESSURE AT SETPOINT. IF THE BUILDING PRESSURE DECREASES BELOW THE DESIRED SETPOINT, THE ASSOCIATED CONTROLLER SHALL MODULATE THE RELIEF FAN SPEED SLOWER TO CONTROL BUILDING PRESSURE AT SETPOINT. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE RELIEF AIR FAN. IF THE SWITCH IS DETECTED TO BE OPEN FOR 40 CONSECUTIVE SECONDS AFTER A REQUEST FOR RELIEF FAN OPERATION A FAN FAILURE ALARM SHALL ANNUNCIATE AT THE BAS AND THE RELIEF FAN SHALL STOP. A MANUAL RESET SHALL BE REQUIRED.

EXHAUST FAN STATUS:
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN. **EXHAUST WITH GRAVITY DAMPERS:**
IN THE OCCUPIED MODE AND AFTER INDOOR FAN STATUS HAS BEEN PROVEN, THE OUTDOOR AIR DAMPER STATUS IS OPEN, AND NO UNIT ALARMS, THE ISOLATION DAMPERS SHALL BE POWERED AND THE POWER EXHAUST FAN SPEED SHALL MODULATE TO MAINTAIN A CONSTANT VOLUME OF AIRFLOW. IF THE SWITCH IS DETECTED TO BE OPEN FOR 30 SECONDS (ADJ.) AFTER A REQUEST FOR EXHAUST FAN OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED AT THE BAS AND THE EXHAUST FAN SHALL STOP. DURING UNOCCUPIED MODE THE POWERED EXHAUST SHALL BE DISABLED. A MANUAL RESET SHALL BE REQUIRED.

SMOKE DETECTOR SHUTDOWN:
THE UNIT SHALL SHUT DOWN IN RESPONSE TO A SIGNAL FROM THE SMOKE DETECTOR INDICATING THE PRESENCE OF SMOKE. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO THE UNIT THROUGH THE DRY CONTACTS OF THE SMOKE DETECTOR. A MANUAL RESET OF THE SMOKE DETECTOR SHALL BE REQUIRED TO RESTART THE UNIT.



1 LIBRARY RTU FLOW DIAGRAM & SEQUENCE OF OPPERATIONS
SCALE: NONE

1/2 0 1
IF THIS BAR DOES NOT MEASURE 1", THEN DRAWING IS NOT TO FULL SCALE

No.	Date	Revisions
1	03-04-25	BIDDING DOCUMENTS

Drawn by VF/AW
Checked by EF
Project No. 43040
Scale AS NOTED
Date 03-04-25

GREENMAN PEDERSEN, INC
2 EXECUTIVE BOULEVARD
SUITE 202
SUFFERN, NY 10901
FED. TAX I.D. NO. 13-3972050000.00
Mechanical & Electrical Engineer:

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

UNIVENT REPLACEMENT AT STONY POINT, THELLS, WEST HAVESTRAW ELEMENTARY SCHOOL
SED# 50-02-01-06-0-014-012
SED# 50-02-01-06-0-025-012
SED# 50-02-01-06-0-024-015
7 GUENEVE DR.
STONY POINT, NY 10980
STONY POINT ROCKLAND COUNTY

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

Drawing Title
FLOW DIAGRAM AND SEQUENCE OF OPPERATIONS - 3

Drawing No.
SPES-M-303