- 1. PROVIDE LABOR, MATERIALS, TOOLS, MACHINERY, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE THE HVAC WORK UNDER THIS CONTRACT. ALL SYSTEMS AND EQUIPMENT SHALL BE COMPLETE IN EVERY ASPECT AND ALL ITEMS OF MATERIAL, EQUIPMENT AND LABOR SHALL BE PROVIDED FOR A FULLY OPERATIONAL SYSTEM AND READY FOR USE. COORDINATE THE WORK WITH THE WORK OF THE OTHER TRADES IN ORDER TO RESOLVE ALL CONFLICTS WITHOUT IMPEDING THE JOB PROGRESS.
- 2. EXAMINE THE DRAWINGS OF OTHER DIVISIONS, AND SECTIONS OF THE SPECIFICATIONS IN ORDER TO DETERMINE THE EXTENT OF THE WORK REQUIRED TO BE COMPLETED UNDER THIS DIVISION. FAILURE TO EXAMINE ALL THE CONTRACT DOCUMENTS FOR THIS PROJECT WILL NOT RELIEVE THIS SECTION AND ANY OTHER SECTIONS OF THEIR RESPONSIBILITIES TO PERFORM THE WORK REQUIRED FOR A COMPLETE FULLY OPERATIONAL AND SATISFACTORY INSTALLATION.
- 3. THE WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING SYSTEMS, EQUIPMENT AND SERVICES, AS SPECIFIED HEREBY. STARTUP SERVICES FOR ALL ROOFTOP UNITS INSTALLED IN THIS CONTRACT SHALL BE INCLUDED IN THE BID.
- 4. ALL SYSTEMS, EQUIPMENT AND SERVICES SPECIFIED HEREIN SHALL BE PROVIDED COMPLETE AND READY FOR USE. ALL EQUIPMENT, DUCTWORK, PIPING, DAMPERS ARE NEW, FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE NOTED.
- 5. EXTEND ALL GREASE FITTINGS TO AN ACCESSIBLE LOCATION.
- 6. FOR ACCESS DOORS TO VALVES, DAMPERS AND ALL OTHER HVAC TYPE OF ITEMS, ACCESSORIES AND EQUIPMENT, CONCEALED IN WALLS, FURRINGS AND CEILINGS. DOOR SHALL PERMIT FULL ACCESS TO THE EQUIPMENT.
- 7. VERIFY FINAL LOCATIONS FOR ROUGH WORK WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT BEING CONNECTED.
- 8. ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER BUILDING COMPONENTS TO ALLOW FOR HVAC INSTALLATIONS.
- 9. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SIZE OF SLEEVES TO BE SET IN POURED CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED.
- 10. COORDINATE THE INSTALLATION OF HVAC MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, LIGHT FIXTURES, AND ALL OTHER INSTALLATIONS AND ACCESSORIES.
- 11. PROVIDE EQUIPMENT AND SYSTEMS THAT, AS DEFINED HEREIN, SHALL BE QUIET AND FREE OF APPARENT VIBRATION IN OPERATIONS.
- 12. OBTAIN EQUIPMENT THAT IS QUIET IN OPERATION AS COMPARED TO OTHER AVAILABLE EQUIPMENT OF ITS SIZE, CAPACITY, AND TYPE; INSTALL EQUIPMENT SO THAT A MINIMUM AMOUNT OF NOISE AND/OR VIBRATION IS TRANSMITTED TO THE BUILDING; AND FABRICATE THE DUCT SYSTEM SO THAT AIR NOISES GENERATED IN THE SYSTEM ARE HELD TO AN ABSOLUTE MINIMUM.
- 13. PROVIDE A COMPLETE SYSTEM OF VIBRATION ISOLATION FOR EACH ITEM OF HVAC EQUIPMENT AND APPARATUS AS SPECIFIED HEREIN, AS SHOWN ON THE DRAWINGS AND AS NEEDED FOR A COMPLETE AND PROPER INSTALLATION.
- 14. PROVIDE SEISMIC RESTRAINTS FOR ALL EQUIPMENT FURNISHED AS PART OF THIS CONTRACT. ANCHOR ALL EQUIPMENT FURNISHED BY OTHERS WHEN INSTALLATION IS CLAIMED BY THIS CONTRACT. DUCTWORK SHALL HAVE SUPPORTS, HANGERS, VIBRATION ISOLATORS, AND SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH CODE AND SMACNA STANDARDS.
- 15. THE WORD "PROVIDE" USED ON DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT MEANS "FURNISH AND INSTALL". WHEN ONLY ONE PART OF ACTION IS REQUIRED, EITHER "FURNISH" OR "INSTALL" WILL BE USED ACCORDINGLY (TYP., U.O.W.N.).

16. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES INVOLVING EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

- 17. THE SCOPE OF WORK IS TO REPLACE THE EXISTING AIR HANDLING UNITS(AHUs) ON THE ROOF. THE EXISTING AIR HANDLING UNITS ARE CUSTOM MULTI-ZONE OUTDOOR UNITS. EXISTING AHUS SHALL BE REPLACED WITH A TYPICAL STANDARD ROOFTOP AHU.
- 18. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO PROVIDE CONTROL WIRING TO THE EXISTING BMS SYSTEM BY SIEMENS. MECHANICAL CONTRACTOR TO FURNISH THE SERVICES OF CONTROL CONTRACTOR TO PREPARE CONTROL WIRING DIAGRAMS.
- 19. CONTRACTOR SHALL PROVIDE AN ADAPTER CURB AND FACTORY ASSEMBLED PIPE CABINET FOR EACH AHU BEING REPLACED. DURING INSTALLATION OF AHU, REMOVE EXISTING GRAVEL FOR NEW BASE FLASHING. NEW BASE FLASHING TO BE INSTALLED OVER EXISTING ROOFING AND EXISTING TERMINATION BARS AS PER 2/A-500.
- 20. PERFORM COMMISSIONING OF THE INSTALLED AIR HANDLING EQUIPMENT AS PER 2020 NYS IECC C408. SEE SPEC 019113. SERVICES ARE TO BE PERFORMED BY A THIRD PARTY APPROVED AGENCY, SEE ALLOWANCE #3.
- 21. FOR SEQUENCE OF OPERATIONS, SEE SPECIFICATION SECTION 230993.

UNIT TAG	EXISTING CURB DIMENSIONS L X W	NEW UNIT DIMENSIONS LX W	CHW & DX COIL UNIT DIMENSIONS L X W	
C2	222.0" X 95.0"	280.0" X 94.0"	-	
C3	221.5" X 78.5"	280.0" X 94.0"	-	
E1	221.5" X 79.5"	222.0" X 94.0"	-	
E2	222.0" X 79.25"	280.0" X 94.0"	320.0" X 94.0"	ALT.#3
E3	222.5" X 78.5"	280.0" X 94.0"	-	
E5	221.0" X 79.0"	222.0" X 94.0"	262.0" X 94.0"	ALT.#4
F2	222.5" X 133.5"	320.0" X 94.0"	-	
H2	222.0" X 79.5"	222.0" X 94.0"	262.0" X 94.0"	ALT.#5
G1	222.0" X 78.5"	222.0" X 94.0"	-	
K1	221.25" X 133.0"	264.0" X 99.0"	-	

REFERENCE TABLE 1 - UNIT DIMENSIONS

NOTE: GC RESPONSIBLE TO PROVIDE ADAPTER CURB FOR NEW UNIT. EXISTING CURB DIMENSIONS AND DIMENSIONS OF NEW UNIT SHOWN FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY IN FIELD EXACT DIMENSIONS FOR PREPARATION OF ADAPTER CURB, SEE ARCH DETAILS.

					Max Fuse								
UNITTA	AG CIRCUIT	CIRCUIT DESCRIPTION	VOLTAGE/PHASE/HZ	MCA(A)	Size (A)								
C2, C3	3 1	Supply & Return Fan	460/3/60	16.1	20								
E1	1	Supply & Return Fan	460/3/60	14.5	20								
E2	1	Supply & Return Fan	460/3/60	26.4	35								
E3	1	Supply & Return Fan	460/3/60	15.5	20								
E5	1	Supply & Return Fan	460/3/60	13.1	15								
F2	1	Supply & Return Fan	460/3/60	49.9	70								
G1, H	2 1	Supply & Return Fan	460/3/60	14.5	20								
K1	1	Supply & Return Fan	460/3/60	23.4	40								

REFERENCE TABLE 2 - POWER/CIRCUIT INFORMATION NOTE: POWER/CIRCUIT INFORMATION OF NEW UNITS TO BE COORDINATED WITH ELECTRICAL CONTRACTOR. SHOWN HERE FOR REFERENCE ONLY.

<u>MECHANICAL VENTILATION SCHEDULE NOTES:</u>

VENTILATION CALCULATIONS COMPLY WITH THE 2020 NYS MECHANICAL CODE. AIRFLOWS ARE EXPRESSED IN CFM UNLESS OTHERWISE NOTED.

GENERAL NOTES

SYSTEM	ROOM	OCCUPANCY CLASSIFICATIO N	FLOOR AREA SF Az	OCCUPANT LOAD OCCUPANT/ 1,000 SF	# OF OCCUPANT S Pz	REQUIRED CFM/OCCUPA NT Rp	REQ. CFM/SF Ra	BREATHING ZONE OUTDOOR AIRFLOW Vbz=RpPz+ RaAz	ZONE DISTRIBU TION EFFECTIV ENESS Ez	TOTAL ROOM OUTDOOR AIR REQUIRED Vot=Vbz/Ez	ACTUAL RM OUTSIDE AIR SUPPLY AIRFLOW CFM	REQ. EXHAUS T AIRFLOW RATE CFM/SF	REQUIRE D EXHAUST AIRFLOW CFM	ACTUAI EXHAUS AIRFLOV CFM
C1	CAFETERIA (1/3)	CAFETERIA	2373.33	100	237	7.5	0.18	2205	0.8	2756	5000	_	_	_
C2	CAFEIERIA (1/3)	CAFETERIA	2373.33	100	237	7.5	0.18	2205	0.8	2756	2800	_	_	_
C3	CAFETERIA (1/3)	CAFETERIA	2373.33	100	237	7.5	0.18	2205	0.8	2756	2800	_	-	_
	220	CLASSROOM	680	35	24	10	0.12	322	0.8	402	425	_	-	_
E4	212	CLASSROOM	690	35	25	10	0.12	333	0.8	416	425	_	-	_
E1	SUITE BETW/N 220 & 219	OFFICE	560	5	3	5	0.06	49	0.8	61	75	_	-	-
	213	CLASSROOM	810	35	28	10	0.12	377	0.8	471	475	_	-	_
	214	CLASSROOM	670	35	24	10	0.12	320	0.8	401	425	_	_	_
	215	CLASSROOM	920	35	33	10	0.12	440	0.8	551	575	_	-	_
E2	216	CLASSROOM	815	35	29	10	0.12	388	0.8	485	500	_	-	_
EZ	217	CLASSROOM	800	35	28	10	0.12	376	0.8	470	475	_	-	_
	218	CLASSROOM	905	35	32	10	0.12	429	0.8	536	550	_	_	_
	219	CLASSROOM	660	35	24	10	0.12	319	0.8	399	400	_	-	_
	206	CLASSROOM	635	35	23	10	0.12	306	0.8	383	400	_	_	_
	207	CLASSROOM	710	35	25	10	0.12	335	0.8	419	425	_	_	_
E3	208	CLASSROOM	720	35	26	10	0.12	346	0.8	433	450	_	_	_
	209	CLASSROOM	780	35 28		10	0.12	374	0.8	467	475	_	_	_
	209A	STORAGE	580			_	0.12	70	0.8	87	100	_	_	_
E5	204	CLASSROOM	1405	35	50	10	0.12	669	0.8	836	850	_	_	_
F2	AUDITORIUM (1/3)	AUDITORIUM	4300	150	645	5	0.06	3483	0.8	4354	4400	_	_	_
F3	AUDITORIUM (1/3)	AUDITORIUM	3705	150	556	5	0.06	3002	0.8	3753	4200	_	_	_
F4	AUDITORIUM (1/3)	AUDITORIUM	590	150	89	5	0.06	480	0.8	601	2100	_	-	_
	GUIDANCE OFFICE	OFFICE	2560	5	13	5	0.06	219	0.8	273	275	-	-	_
110	NURSE OFFICE (109)	OFFICE	1175	5	6	5	0.06	101	0.8	126	130	-	-	_
H2	CORRIDOR	CORRIDOR	410	_	-	_	0.06	25	0.8	31	50	_	-	_
	CORRIDOR	CORRIDOR	410	_	-	_	0.06	25	0.8	31	50	_	-	_
	120	CLASSROOM	335	35	12	10	0.12	160	0.8	200	200	_	-	_
	120A			30	0.8	38	50	_	-	-				
G1	118	118 CLASSROOM 695 35 25 10 0.12 333 0.8		417	425	_	-	-						
	119	CLASSROOM	695	35	25	10	0.12	333	0.8	417	425	_	-	_
	CORRIDOR	CORRIDOR	550	_	_	_	0.06	33	0.8	41	50	_	_	_
K1	GIRLS LOCKER RM	LOCKER RM	2545	_	-	_	_	-	_	_	_	0.5	1273	1273

MECHANICAL VENTILATION SCHEDULE

CON	DEN	$\overline{211}$	NG U	JNITS)								1		UNIT	SIZE	BASED	0]	N D.	AIKIN	
UNIT No.	LOCATION		COOLING CAPACITY MBH	OPERATING UNIT WEIGHT (LB)	UNIT DIMENSIONS (IN) LXWXH	COMPRESSOR			REFRIGERANT (# OF CONNECTIONS)						CONDENSER FAN		POWER CONSUMPTION			MANUFACTURER AND MODEL	
				(25)	LAWAII	QTY.	STAGES	AMPS	TYPE	SUCTION	LIQUID	HOT GAS	NO. OF	FPI	QTY.	AMPS.	V/PH/HZ	МСА	MOPD		
								FLA	7	OD (IN)	OD (IN)	BYPASS(IN)	ROWS		MOTORS	FLA					
ACCU-E2	ROOF	12.5	283.8	1853	58.0x99.0x55.5	3	4 STEPS	19.2/10.6/10.6	R-410A	(2) 1.62	(2) 0.88	(2) 0.88	1	18	2	2.1	460/3/60	50	60	RCS025D	AL1
ACCU-E5	ROOF	12.0	143.0	650	73.9x38.4x44.8	2	2 STEPS	10.6/10.6	R-410A	(1) 1.325	(1) 0.625	_	1	23	2	1.4	460/3/60	27	35	RCS12F150D	AL1
ACCU-H2	ROOF	12.5	143.0	650	73.9x38.4x44.8	2	2 STEPS	10.6/10.6	R-410A	(1) 1.325	(1) 0.625	_	1	23	2	1.4	460/3/60	27	35	RCS12F150D	AL1

1. PROVIDE INSULATED RERIGERATION PIPING BETWEEN UNITS AND ASSOCIATED AIR HANDLER UNIT. PROVIDE ALL REQUIRED PIPE SUPPORTS/CLAMPS. 2. PROVIDE HIGH EFFICIENCY ESTAGE COMPRESSOR MOTORS

																RO	OFTC)P A	IR H	ANDI	ING	UNIT	' SCI	HEDU	JLE											τ	JNIT SI	IZE B	ASED (ON DA	AIKIN		
	Unit Energy Recovery														Cooling Coil - CHW											DX R410A te 3, 4, & 5		H															
				Su	pply Fan			Ret	turn/Exhai	ust Fan	ı	Filters	Fan	Recover	ed Capacity	Mixed	Air LAT			Effect	iveness		EA	Т	LAT																		
TAG	Weight (lbs)	t Model	Airflow (CFM)	ESP (inH2O	TSF) (inH2		Motor ize (HP)	Airflow (CFM)	ESP (inH2O)	Motor Size (HP	Face) Area (ft²	Efficiency	Outsid / Airflov (CFM)	/ Cooling	Heating (MBH)	Cooling DB (°F)	Heating DB (°F)	Wheel APD (inH2O)	Total Cooling	Sensible Cooling		Sensible Heating	EDB (°F)	EWB (°F)	LDB L	LWB (°F)	/T LW [†]	GPM	FPI Ro	Tot WS Capa (MB	city Capac		Rows	Total Capacity (MBH)	y FPI	Rows	EDB (°F)	LDB (°F)	EWT (°F)	LWT (°F)	GPM Ca	Total pacity MBH)	
C-2	8385	RDS800	C 5000	1.00	3.10	3	5.0	5000	1.00	3.0	50.0	MERV 14	2800	109.29	210.18	76.9	63.8	0.45	81.76%	83.09%	83.82%	84.23%	76.9	63.5	54.1	53.9 45	.0 59.	1 20.9	11 8	140.	.98 124.4	5 -	-	-	14	1	63.8	95.7	180.0	139.9	8.7 1	74.23	BASE
C-3	8255	RDS800	C 5000	1.00	2.8	31	5.0	5000	1.00	3.0	50.0	MERV 14	2800	109.29	210.18	76.9	63.8	0.45	81.76%	83.09%	83.82%	84.23%	76.9	63.5	56.4	55.3 45	.0 57.3	3 20.9	6 8	122.	.93 112.2	-	-	-	6	1	63.8	81.8	180.0	139.9	4.9	98.17	BASE
E-1	5842	RDS800	C 4860	1.00	2.42	2	5.0	4860	1.00	3.0	50.0	MERV 14	1400	_	_	-	-	_	-	_	-	_	78.4	65.5	55.3	55.1 45	.0 59.0	23.0	10 8	154.	.88 122.9	j -	_	_	6	1	53.9	74.6	180.0	140.0	5.5 1	09.89	BASE
E-2	8235	RDS800	C 8520	1.00	3.5	51	10.0	8520	1.00	5.0	50.0	MERV 14	2925	113.36	218.27	76.2	66.1	0.47	81.18%	82.58%	83.32%	83.76%	76.2	63.0	59.3	56.8 45	.0 58.7	7 24.0	13 5	157	'.3 157.3	6	4	225.98	6	1	66.1	79.0	180.0	140.0	6.0 1	19.95	BASE
E-3	8244	RDS800	C 5880	1.00	2.94	4	5.0	5880	1.00	3.0	50.0	MERV 14	1850	76.25	145.26	75.8	67.3	0.30	86.34%	87.11%	87.67%	87.92%	75.8	62.6	56.8	55.6 45	.0 59.0	18.2	13 6	122.	.35 122.0		_	_	6	1	67.3	82.9	180.0	139.8	5.0 1	00.47	BASE
E-5	5727		C 5100	0.75	2.33		5.0	5100	1.00	2.0	50.0	MERV 14		_	_	_	_	_	-	_	_	_	79.0		58.0					134		, 6	4	166.7	14	1	40.3	77.5				07.73	BASE
F-2	8975				4.50		20.0	12300	1.00	15.0	50.0	MERV 14		156.87	306.35	76.7	64.6	0.70	74 68%	76.83%	77 74%	78 41%				55.1 45				300			_		9	2		104.3					ALT. #2-3
H-2	5589			1.00	2.52		5.0	6710	1.00	3.0	50.0	MERV 14		-	-		-	-	-	-	-	-		65.8					7 5	113.			4	209.4	9	1	65.1	82.9	180.0				BASE
G-1	5669			1.00	2.65		5.0	6210	1.00	3.0	50.0	MERV 14						_	_	_						58.3 45			2 6	163.				- 200.4	8	1	59.3	80.1		140.0			ALT. #2-1
K-1	6669						15.0	-	-	-	63.3	MERV 14			-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	-	9	1	49.0	79.6					ALT. #2-2

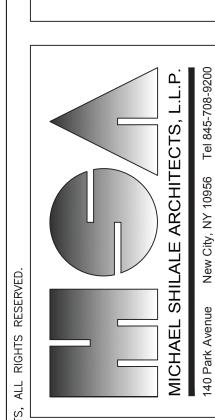
1. BASIS OF DESIGN IS BY DAIKIN OR APPROVED EQUAL.

- 2. PROVIDE SUPPLY AND RETURN SMOKE DETECTORS (FACTORY INSTALLED) TO SHUTDOWN UNIT.
- 3. PROVIDE 4" PLEATED AIR FILTERS, MERV 14 RATING, SEE SPEC 234100 FOR MORE INFO.
- 4. PROVIDE START-UP BY MANUFACTURER'S AUTHORIZED TECHNICIAN. 5. PROVIDE FACTORY INSTALLED 0-100% ECONOMIZER WITH DIFFERENTIAL ENTHALPY CONTROL.
- 6. UNIT TO BE DELIVERED VIA CRANES, ALL NECESSARY PERMITS FOR RIGGING REQUIRED. 7. MC TO PROVIDE FACTORY INSTALLED VFD W/ INTEGRAL MOTOR STARTERS FOR EACH FAN, EC TO FURNISH AND INSTALL FUSIBLE
- TYPE DISCONNECT SWITCHES(FIELD INSTALL) 8. PROVIDE HOT GAS BYPASS WITH CONTINUOUS CAPACITY MODULATION (MAXIMUM 25% TOTAL CAPACITY).
- 10. PROVIDE FACTORY ZONE AND TEMPERATURE SENSORS FOR PROPER INSTALLATION AND COORDINATION WITH UNIT CONTROLS. 11. PROVIDE BACNET COMPATIBLE CONTROLS FOR INTERCONNECTION TO EXISTING SIEMENS BMS SYSTEM. FULL DDC CONTROL OF ENERGY WHEELS (WHERE APPLICABLE) INCLUDING FROST PROTECTION VIA ENERGY WHEEL VFD SPEED CONTROL, 100% ECONOMIZER MODE VIA ENERGY WHEEL BYPASS DAMPERS
- 12. PROVIDE SEPARATE CONDENSING UNITS MOUNTED ON NEW MODIFIED CURB FOR ASSOCIATED DX COIL (UNIT E2, E5, H2 ONLY), SEE CONDENSING UNIT SCHEDULE. 13. PROVIDE ENTHALPY WHEEL FOR THE FOLLOWING UNITS: C-2, C-3, E-2, E-3 & F-2.
- 14. DEMAND CONTROL VENTILATION REQUIRED FOR ALL UNITS EXCEPT H-2 & K-1. PROVIDE TWO(2) SETS OF CO2 SENSORS IN EACH ASSEMBLY SPACE FOR F-2, C-2, & C-3. PROVIDE OCCUPANCY SENSORS IN EACH SPACE FOR E-1, E-2, E-3, E-5 & G-1. 15. CHILLED WATER SYSTEM COILS TO BE SIZED FOR 30% PROPYLENE GLYCOL
- 16. MECHANICAL TO PROVIDE HEATING AND COOLING CONTROL VALVE, SEE COIL PIPING DETAILS ON DRAWING M501.

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NRHS
ROOFTOP HVAC
AND ANNEX UV
REPLACEMENT

Mechanic & Electri Engineer:



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SCHEDULES & NOTES SCALE: N.T.S.