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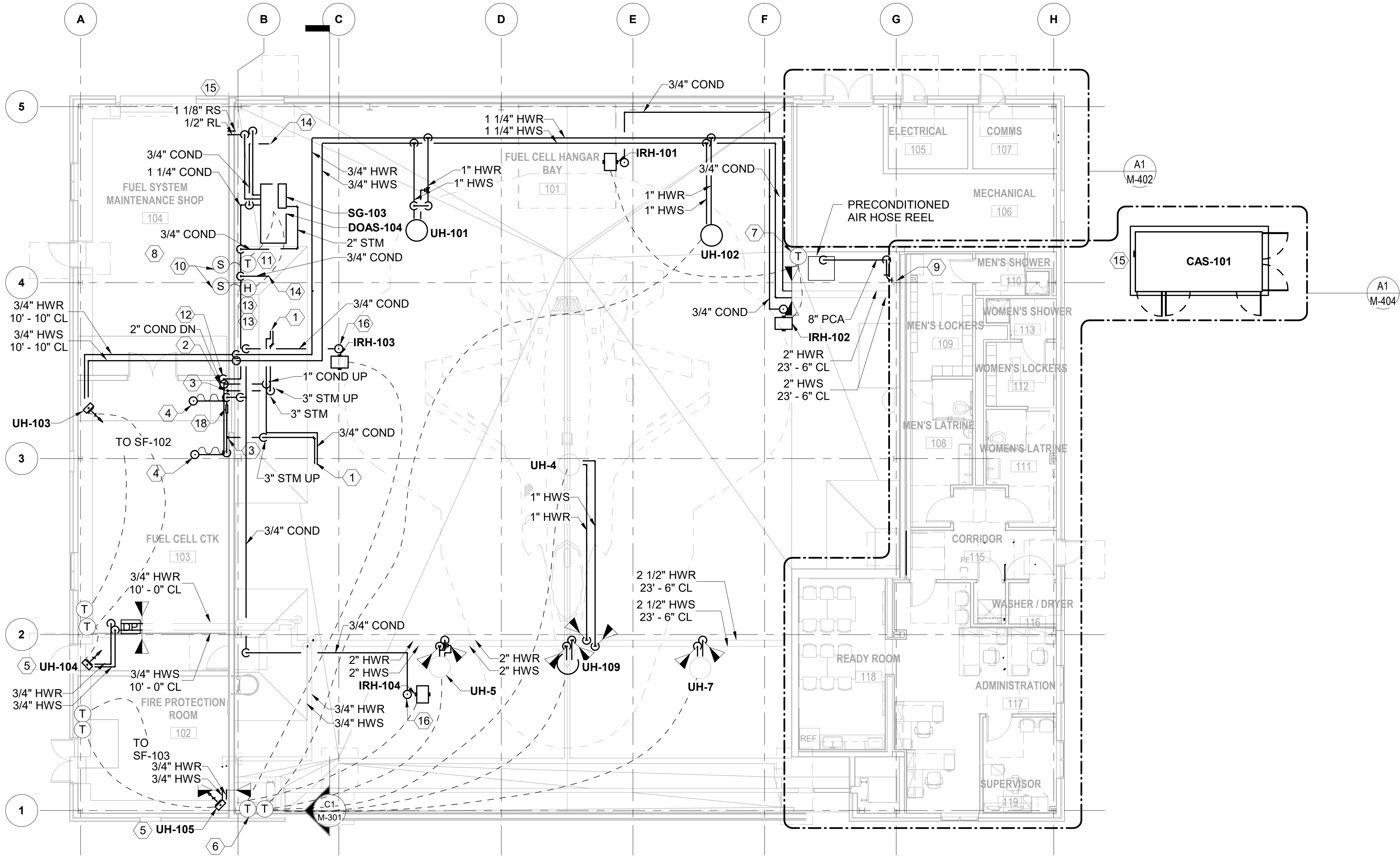
GENERAL NOTES

1. SEE SHEET M-001 FOR MECHANICAL GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
2. REFRIGERANT PIPING SIZES ARE PRELIMINARY. CONTRACTOR SHALL COORDINATE REFRIGERANT PIPING SIZES AND ACCESSORIES WITH EQUIPMENT MANUFACTURER.
3. BID OPTION #1: PRECONDITIONED AIR UNITS (CAS) EQUIPMENT, CAS CONTROLS, INSTALLATION, SYSTEM TESTING, AND WARRANTY SHALL BE PART OF ABI#1. ALL ASSOCIATED FACILITY POWER, PIPING, REELS, HOSE AND OTHER ACCESSORIES SHALL BE PART OF THE BASE BID.

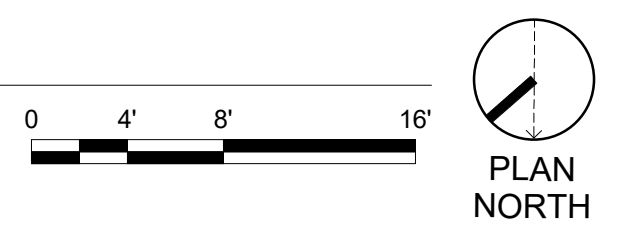
KEYED NOTES

- ① STEAM LINE AND CONDENSATE RETURN TO HUMIDIFIER DISPERSION GRID.
- ② ROUTE CONDENSATE FROM DISPERSION GRIDS AND CONNECT TO STEAM GENERATOR DRAIN LINE. ROUTE TO WALL MOUNTED CONDENSATE COOLER IN FUEL CELL CTX. CONDENSATE COOLER SHALL DRAIN TO NEW FUNNEL FLOOR DRAIN.
- ③ ROUTE STEAM LINE UP THROUGH ROOF CURB TO STEAM GENERATOR.
- ④ ROUTE 1 1/2 DRAIN FROM STEAM GENERATOR THROUGH ROOF CURB DOWN AND CONNECT TO CONDENSATE FROM DISPERSION GRIDS. ROUTE TO WALL MOUNTED CONDENSATE COOLER IN FUEL CELL CTX.
- ⑤ CONNECT HWS/R TO EXISTING AND ROUTE TO NEW UNIT HEATER.
- ⑥ PROVIDE ADDITIONAL HIGH LEVEL THERMOSTAT ABOVE FOR SOUTH DESTRATIFICATION FANS.
- ⑦ PROVIDE ADDITIONAL HIGH LEVEL THERMOSTAT ABOVE FOR NORTH DESTRATIFICATION FANS.
- ⑧ FUEL SYSTEM MAINTENANCE SHOP 104 IS A CLASS 1 DIV 2 ZONE 2 SPACE.
- ⑨ ROUTE THROUGH HANGAR WALL ACROSS LOW ROOF TO CAS-101. SEE M-103 FOR CONTINUATION.
- ⑩ THERMOSTAT AND HUMIDISTAT SHALL HAVE REMOTE SENSOR SUITABLE FOR CLASS 1 DIV 2 ZONE 2 SPACE.
- ⑪ GRAPHICAL USER INTERFACE ON HANGAR WALL, PROVIDE DISPLAY OF TEMPERATURE AND HUMIDITY LOCATED ON WALL. ALLOW IT TO BE VISIBLE THROUGH WINDOW INTO 104 FUEL SYSTEM MAINTENANCE SHOP.
- ⑫ ROUTE CONDENSATE FROM DOAS-104, SG-103 AND HUMIDIFIER GRID TO NEW FUNNEL DRAIN IN FUEL CELL CTX.
- ⑬ REMOTE CONTROLLER FOR STEAM GENERATORS (SG).
- ⑭ CONDENSATE RETURN FROM DUCT HEATER TO FLOOR DRAIN.
- ⑮ REFRIGERANT PIPING TO CONDENSING UNIT ON ROOF.
- ⑯ CONNECT TO DRAIN CONNECTION ON IRH HEATERS WITH 1/2" STAINLESS SIPHON. PROVIDE 12' LONG 3/4" STAINLESS NIPPLE. TRANSITION TO SCHEDULE 80 PVC AND ROUTE AS INDICATED.
- ⑰ ROUTE ALL HORIZONTAL PIPING WITH VEE STYLE HANGERS AND CONTINUOUS 18 GAUGE STEEL SUPPORT CHANNEL. (B-LINE MODEL B3106 WITH B3106V OR EQUAL).
- ⑱ NEUTRALIZATION KIT SHALL BE WALL MOUNTED AND ROUTE 3/4" OUTLET TO FLOOR DRAIN.

LEGEND



B1 HVAC PIPING PLAN - NEW WORK
SCALE: 1/8" = 1'-0"



VERMONT AIR NATIONAL GUARD
BURLINGTON INTERNATIONAL AIRPORT
SO BURLINGTON, VERMONT

Project No. - CURZ152812

date 04/25/17	detailed C. McAfee
designed L. Hillis	checked R. Jordan



KANSAS CITY, MISSOURI
ENGINEERS ARCHITECTS & CONSULTANTS

F-35 ALTER BLDG 385

HVAC PIPING PLAN - NEW WORK

project	contract
92654	W9133L-15-D-0003/ZT0
drawing	rev.

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
GENERAL NOTES

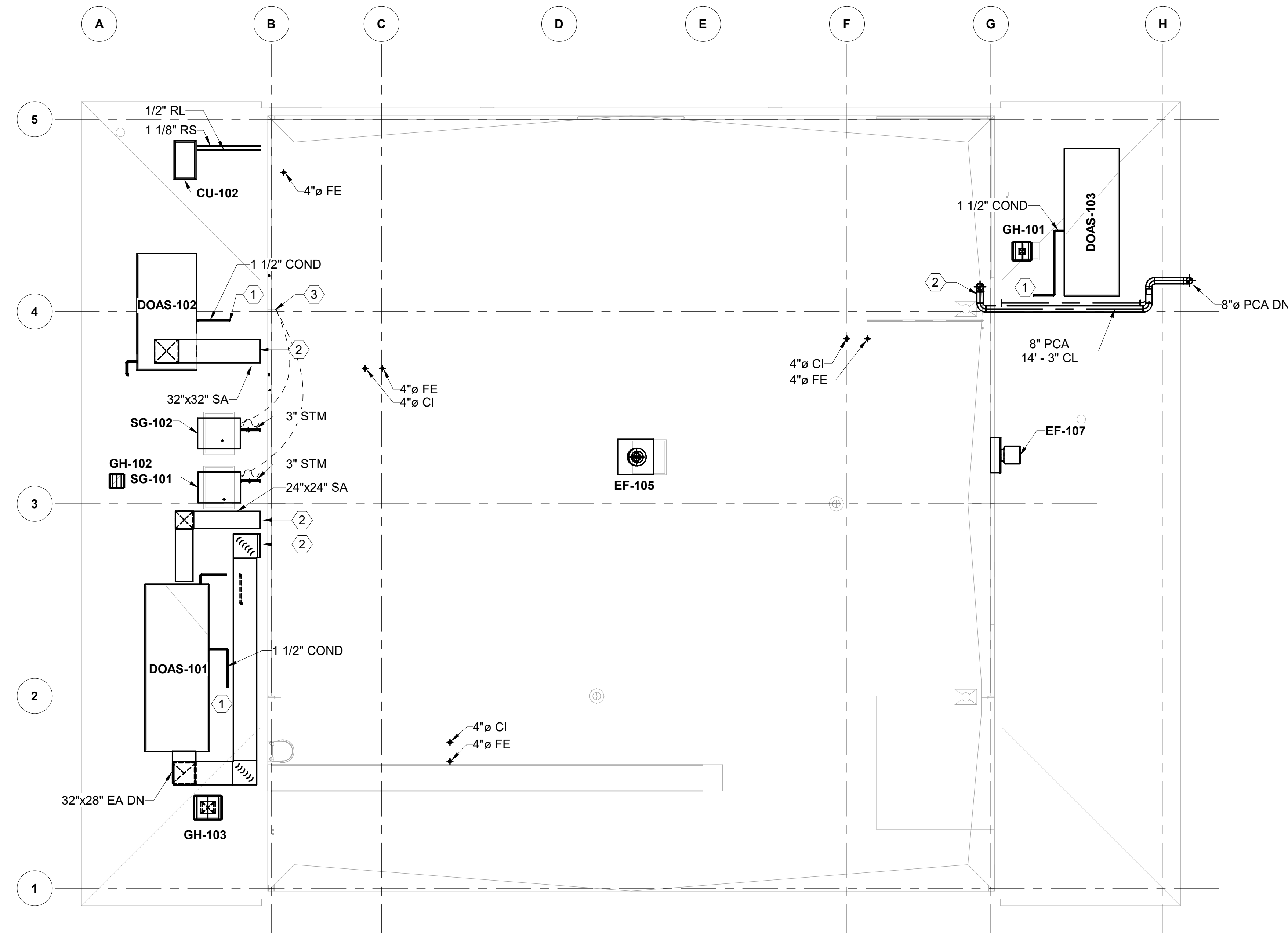
1. SEE SHEET M-001 FOR MECHANICAL GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
2. REFER TO STRUCTURAL PLANS FOR OUTDOOR DUCT SUPPORT DETAILS.

KEYED NOTES

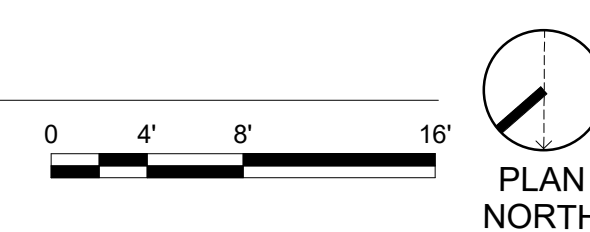
- ① ROUTE CONDENSATE TO ROOF DRAIN.
- ② DUCTWORK THROUGH HANGAR WALL. SEE SHEET M-101 FOR CONTINUATION.
- ③ TO REMOTE CONTROLLER LOCATED IN 101 FUEL CELL HANGAR BAY ON M-102.

LEGEND





B2 HVAC PLAN - NEW WORK - HIGH PARAPET
SCALE: 1/8" = 1'-0"



VERMONT AIR NATIONAL GUARD
BURLINGTON INTERNATIONAL AIRPORT
SO BURLINGTON, VERMONT

Project No. - CURZ152812

date
05/19/17

K. HIMES

checked
R. JORDAN

KANSAS CITY, MISSOURI
ENGINEERS ARCHITECTS & CONSULTANTS

F-35 ALTER BLDG 385

HVAC PLAN - NEW WORK - ROOF PLAN

project

contract

92654
drawing

rev.

M-103 — 0

file

DEDICATED OUTSIDE AIR UNIT SCHEDULE (DOAS) 1/3 (SPEC 230000)																										
TAG	SERVICE	LOCATION	ALTITUDE (FT)	MAX. AIRFLOW (CFM)	EXHAUST AIRFLOW (CFM)	EXTERNAL STATIC PRESSURE (IN. W.C.)	TOTAL STATIC PRESSURE (IN. W.C.)	SUPPLY FAN				SUPPLY FAN MOTOR			EXHAUST FAN					EXHAUST FAN MOTOR			DOAS UNIT ELECTRICAL			
								MAX BHP	FAN RPM	TYPE	VOLUME CONTROL	MIN. MOTOR HP	MOTOR RPM	MOTOR TYPE	MAX BHP	EXTERNAL STATIC PRESSURE (IN W.C.)	AIRFLOW (CFM)	FAN RPM	TYPE	VOLUME CONTROL	MIN. MOTOR HP	MOTOR RPM	MOTOR TYPE	VOLTS	PHASE	MCA
DOAS-101	101 - FUEL CELL HANGAR BAY	ROOF	340	4095	4095	0.6	NOTE 1	5	1750	DIRECT DRIVE	VFD	7.5	1750	ODP	4	1.5	4095/1825	1800	DIRECT DRIVE	VFD	5	1750	TEFC	460	3	64.4
DOAS-102	101 - FUEL CELL HANGAR BAY	ROOF	340	6855	0	0.5	NOTE 1	5	1750	DIRECT DRIVE	VFD	10	1750	ODP	0	0	0	0	NA	NA	0	0	NA	460	3	16.7
DOAS-103	117 - ADMINISTRATION	ROOF	340	1240	0	1.5	NOTE 1	0.5	1750	DIRECT DRIVE	VFD	1	1750	ODP	0	0	0	0	NA	NA	0	0	NA	460	3	25.9
DOAS-104	104 - FUEL SYSTEM MAINTENANCE SHOP	101 - FUEL CELL HANGAR BAY	340	1185	0	1	NOTE 1	1.5	2015	BELT DRIVE	VFD	1.5	1750	ODP	0	0	0	0	NA	NA	NA	NA	NA	460	3	22.5

DEDICATED OUTSIDE AIR UNIT SCHEDULE (DOAS) 2/3																							
TAG	OUTSIDE AIRFLOW (CFM)	COIL FACE VELOCITY (FPM)	HEAT RECOVERY TYPE	HEAT RECOVERY SECTION										PRE-FILTER		FINAL FILTER			ADDITIONAL DIRTY FILTER PRESSURE DROP (IN. W.C.)	APPROX. UNIT WEIGHT (LBS)			
				OUTSIDE AIR					EXHAUST AIR					WINTER EFFECTIVENESS	SUMMER EFFECTIVENESS	TYPE	EFFICIENCY (MERV)	PRESSURE DROP (IN. W.C.)			TYPE	EFFICIENCY (MERV)	PRESSURE DROP (IN. W.C.)
				SUMMER EAT DB/WB (DEG. F.)	SUMMER LAT DB/WB (DEG. F.)	WINTER EAT DB/WB (DEG. F.)	WINTER LAT DB/WB (DEG. F.)	AIR PRESS DROP (IN WG)	EXHAUST AIRFLOW (CFM)	SUMMER EAT DB/WB (DEG. F.)	WINTER EAT DB/WB (DEG. F.)	AIR PRESS DROP (IN WG)											
DOAS-101	4095	500	FIXED PLATE	88/71	85/70	-10/-12	12.0	0.70	4095	75/63.9	75/63.9	1.50	58	55	PLEATED	8	1	NA	0	0	0	8000	
DOAS-102	6855	500	NA	0				0.00	0	0	0	0.00	0	0	PLEATED	8	1	NA	0	0	0	3700	
DOAS-103	1240	500	NA	0		0		0.00	0	0	0	0.00	0	0	PLEATED	8	1	PLEATED	13	1	0.75	3300	
DOAS-104	1185	500	NA	0	0	0	0	0.00	0	0	0	0.00	0	0	PLEATED	8	0.58	PLEATED	13	0.65	0.75	640	

DEDICATED OUTSIDE AIR UNIT SCHEDULE (DOAS) 3/3																														
TAG	REFRIGERANT COOLING COIL									HOT GAS REHEAT COIL		REFRIGERANT TYPE	COMPRESSOR				CONDENSER FANS		SUMMER AMBIENT TEMPERATURE (DEG F)	HEATING COIL							BASIS OF DESIGN		REMARKS	
	COIL AIR QUANTIT Y (CFM)	EAT DB (DEG. F.)	EAT WB (DEG. F.)	LAT DB (DEG. F.)	LAT WB (DEG. F.)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	MAX. FACE VELOCITY (FPM)	MAX. AIR PRESSURE DROP (IN. W.C.)	EAT (DEG. F.)	LAT (DEG. F.)		TYPE	CAPACITY MODULATION	NUMBER	EFFICIENCY (EER)	NUMBER	HP		HEATING COIL TYPE	FUEL	ENT AIR TEMP (DEG. F.)	LEAVING AIR TEMP (DEG. F.)	OUTPUT CAPACITY (MBH)	INPUT (MBH)	MIN. EFFICIENCY (%)	AIR PRESS DROP (IN. WG)	MANUFACTURER		MODEL
DOAS-101	4095 CFM	88	71	53	52	319	147	500	0.4	53	75	R-410A	SCROLL	VARIABLE ON LEAD	2	11	4	1	95	INDIRECT	NATURAL GAS	-10	76.2	406	508	80	0.05	ENGINEERED AIR	FWE224/DJS40/C/O/HRA/MV	1,2,3,4,5,6,7,8
DOAS-102	6855 CFM	83.8	74.2	53	52	370	176	500	0.4	53	75	R-410A	SCROLL	VARIABLE ON LEAD	2	11	4	1	95	INDIRECT	NATURAL GAS	-10	75	643	804	80	0.05	ENGINEERED AIR	DSJ100/O/MV	1,3,4,5,6
DOAS-103	1240 CFM	83.8	74.2	55	54	85	39	500	0.11	55	78	R-410A	SCROLL	VARIABLE ON LEAD	1	11	2	1	95	INDIRECT	NATURAL GAS	-10	75	105	131	80	0.05	ENGINEERED AIR	FW83/DJS20/C/O/MV	1,3,4,5,6
DOAS-104	1185 CFM	83.8	74.2	57.4	57.3	69.8	34.5	500	1.66	0	0	R-410A	NA	NA	NA	NA	NA	95	NA	NA	0	0	0	0	NA	0	DAIKIN	CAH003GDAC	5,6,7	
NOTES: 1. PRESSURE DROPS ASSOCIATED WITH FILTERS, COILS, ETC. SHALL BE INCLUDED IN THE TOTAL INTERNAL STATIC PRESSURE BY THE EQUIPMENT MANUFACTURER. DIRTY FILTER PRESSURE SHALL BE USED FOR FILTERS. 2. PROVIDE FLAT PLATE HEAT EXCHANGER. 3. VFD PROVIDED BY DIV 25 TO BE FIELD INSTALLED. 4. PROVIDE SLOPED STRUCTURAL ROOF CURB PER SPEC 23 00 00. 5. PROVIDE HORIZONTAL DISCHARGE. 6. MANUFACTURER SHALL PROVIDE SINGLE POINT ELECTRICAL CONNECTION. 7. PROVIDE UNIT LESS CONTROLS. DIVISION 25 WILL FIELD INSTALL ALL CONTROLS. 8. COOLING AND HEATING CAPACITIES BASED ON HEAT EXCHANGER EXHAUST AIRFLOW OF 1825 CFM.																														

FAN COIL UNIT SCHEDULE (FCU) (SPEC 238100.0020)																								
TAG	AREA SERVED	MATCHED HP/CU	ALTITUDE (FT)	SUPPLY FAN		DX COOLING COIL						HEATING COIL							FILTER TYPE	WEIGHT (LBS.)	BASIS OF DESIGN			
				TOTAL AIRFLOW (CFM)	EXT. STATIC PRESSURE (IN. W.C.)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT DB (DEG F.)	EAT WB (DEG F.)	LAT DB (DEG F.)	LAT WB (DEG F.)	TYPE	TOTAL CAPACITY (MBH)	EAT (DEG. F.)	LAT (DEG. F.)	EWT (DEG. F.)	LWT (DEG. F.)	FLOW (GPM)			MANUFACTURER	MODEL	REMARKS	
FCU-101	118 - READY ROOM	HP-101	340	1050	0.1	25.8	23.2	78.5	62.4	55	52.4	HEAT PUMP	32.4	67.4	95	NA	NA	NA	WASHABLE	40	DAIKIN	FCQ30PAVJU	1,2,3,4	
FCU-102	119 - SUPERVISOR	HP-102	340	170	0.1	5	4.6	80.1	62.7	55	52.3	HEAT PUMP	10	62.6	95	NA	NA	NA	WASHABLE	40	DAIKIN	FFQ09Q2VJU	1,2,3,4	
FCU-103	117 - ADMINISTRATION	HP-103	340	200	0.1	6.8	6	82.2	64.2	55	52.7	HEAT PUMP	10	62.5	95	NA	NA	NA	WASHABLE	40	DAIKIN	FFQ09Q2VJU	1,2,3,4	
FCU-104	115 - CORRIDOR	HP-104	340	70	0.1	1.6	1.6	88.6	61.3	55	52	HEAT PUMP	10	62.5	95	NA	NA	NA	WASHABLE	40	DAIKIN	FFQ09Q2VJU	1,2,3,4	
NOTES: 1. INDOOR UNIT (FCU) POWERED BY OUTDOOR UNIT (HP/CU). 2. PROVIDE INTEGRAL DRAIN PAN AND CONDENSATE PUMP. 3. PROVIDE CONTROLS WITH INTERFACE TO DDC AND EMCS SYSTEM. 4. PROVIDE WITH ECM FANS.																								

COMPUTER ROOM AIR CONDITIONER SCHEDULE (CRAC) (SPEC 238123.0020)																		
TAG	LOCATION	COOLING TYPE	FAN			COOLING COIL		REHEAT COIL		HUMIDIFIER			ELECTRICAL				REMARKS	
			TYPE	TOTAL AIRFLOW (CFM)	EXT. STATIC PRESSURE (IN. W.C.)	FAN MOTOR HP	SENSIBLE CAPACITY (MBTUH)	TOTAL CAPACITY (MBTUH)	TYPE	CAPACITY (KW)	HUMIDIFIER TYPE	CAPACITY (LBS/HR)	KW	VOLTS	PHASE	FULL LOAD AMPS (AMPS)		
ACU-101	107 - COMM	DX	CEILING	1020	0.5	0.2	13.3	11.1	ELECTRIC	3.6	STEAM GEN	2.5	0.88	208	1	1.4	200	1,2,3,4,5,6,7,8
NOTES: 1. PROVIDE WITH 1 INCH THICK MERV 8 FILTER. 2. PROVIDE INTERNAL DRAIN PAN AND CONDENSATE PUMP. 3. PROVIDE WITH REMOTE AIR COOLED CONDENSING UNIT. 4. CONTRACTOR TO FURNISH AND INSTALL REFRIGERANT PIPING AND PIPING ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS. 5. CONTRACTOR SHALL PROVIDE LOW VOLTAGE WIRING, POWER WIRING, CONDENSATE PIPING, AND REFRIGERANT FOR INTERCONNECT CHARGE. 6. PROVIDE FACTORY MOUNTED CONTROLS WITH LON CARD FOR INTEGRATION INTO THE BUILDING BMS. 7. BASIS OF DESIGN LIEBERT MMD12E 8. PROVIDE WITH BOTTOM SUPPLY AND RETURN GRILLES.																		

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (HP/CU) (SPEC 238100.00.20)																			
TAG	MATCHING INDOOR UNIT	ROOM SERVED	TYPE	COOLING TOTAL (MBH)	HEATING TOTAL (MBH)	COMPRESSOR TYPE	AMBIENT TEMPERATURE (DEG. F.)	REFRIGERANT TYPE	ELECTRICAL				MINIMUM EFFICIENCY (SEER)	SOUND PRESSURE (dba)	WEIGHT (LBS)	BASIS OF DESIGN		REMARKS	
									VOLTS	PHASE	MCA (AMPS)	MOPD (AMPS)				MANUFACTURER	MODEL		
CU-101	CRAC-101	107 - COMM	DX	11.2	0.0	SCROLL	95	R407C	208	1	10	15	NA	45	100	LIEBERT	PFH014ALZ	1,2	
CU-102	DOAS-104	104 - FUEL SYSTEM MAINTENANCE SHOP	DX	69.8	0.0	SCROLL	95	R410A	460	3	15	25	11.9	0	300	DAIKIN	RCS06F078D	1,2,3	
HP-101	FCU-101	118 - READY ROOM	HEAT PUMP	11.5	16.2	INVERTER	95	R410A	208	1	9.1	15	15.8	45	100	DAIKIN	RZQ30PVJU	1,2	
HP-102	FCU-102	119 - SUPERVISOR	HEAT PUMP	5.0	10.0	INVERTER	95	R410A	208	1	8.6	15	20.9	45	60	DAIKIN	RX09QMKJU	1,2	
HP-103	FCU-103	117 - ADMINISTRATION	HEAT PUMP	6.8	10.0	INVERTER	95	R410A	208	1	8.6	15	20.9	45	60	DAIKIN	RX09QMKJU	1,2	
HP-104	FCU-104	115 - CORRDOR	HEAT PUMP	1.6	10.0	INVERTER	95	R410A	208	1	8.6	15	20.9	45	60	DAIKIN	RX09QMKJU	1,2	
NOTES: 1. STARTER DISCONNECT PROVIDED BY DIV 26. 2. PROVIDE WITH WIND BAFFLE. 3. EFFICIENCY IS EER.																			

PRE-CONDITIONED AIR UNIT SCHEDULE (CAS) (SPEC 230099)															
TAG	LOCATION	ALTITUDE (FT)	AIRFLOW (LB/MIN)	WATER VAPOR MIN-MAX (GRAINS/LB)	EXTERNAL STATIC PRESSURE (PSIG)	DELIVERED STATIC PRESSURE (PSIG)	TOTAL STATIC PRESSURE (PSIG)	AMBIENT CONDITIONS			SUPPLY AIR CONDITIONS		SUPPLY FAN MOTOR		REMARKS
								SUMMER DB (DEG F)	SUMMER WB (DEG F)	WINTER DB (DEG F)	MIN SUPPLY TEMP (DEG F)	MAX SUPPLY TEMP (DEG F)	VOLTS	PHASE	
CAS-101	OUTDOOR	340	46.5	0-55	0.5	5.25	NOTE 1	85	70	-10	35	55	460	3	1,2,3,4
NOTES: 1 PRESSURE DROPS ASSOCIATED WITH FILTERS, COILS, ETC. SHALL BE INCLUDED IN THE TOTAL INTERNAL STATIC PRESSURE BY THE EQUIPMENT MANUFACTURER. DIRTY FILTER PRESSURE SHALL BE USED FOR FILTERS. 2 WATER VAPOR SHALL CONTAIN NO WATER DROPLETS. 3 AIRFLOW, WATER VAPOR, AND DELIVERED STATIC PRESSURE INDICATED IN SCHEDULE REFER TO ATTRIBUTES AT THE AIRCRAFT CONNECTION. 4 BID OPTION #1: PRECONDITIONED AIR UNITS (CAS) EQUIPMENT, CAS CONTROLS, INSTALLATION, SYSTEM TESTING, AND WARRANTY SHALL BE PART OF AB#1. ALL ASSOCIATED FACILITY POWER, PIPING, REELS, HOSE AND OTHER ACCESSORIES SHALL BE PART OF THE BASE BID.															