DIFFUSER (TYP.) -

DETAIL

- AIR TERMINAL UNIT (CV OR VAV)

✓SEE NOTE 5

SEE NOTE 1 | REHEAT COIL -

1. RIGID STRAIGHT TERMINAL UNIT INLET LENGTH SHALL BE A

2. A FLEXIBLE AIR DUCT CONNECTOR IS NOT MANDATORY FOR INLET TO THIS

BOX. BUT ALLOWED TO ACCOMMODATE MINOR OFFSETS. MAXIMUM LENGTH

3. A BRANCH DUCT SERVING AN INDIVIDUAL BOX MAY BE THE SAME SIZE AS THE

BOX INLET, PROVIDED THE EQUIVALENT LENGTH OF THE BRANCH DUCT, AS

4. FLEXIBLE AIR DUCT CONNECTORS, WHEN USED FROM TERMINAL UNIT SUPPLY AIR DUCT TO DIFFUSER, SHALL NOT EXCEED 8'-0". USE RIGID ELBOWS FOR

VAV Air Terminal Unit Duct Connection Detail

-

- RIGID DUCT TO AIR TERMINAL

Supply Duct Takeoff for Air Terminal Unit

PLAN VIEW

ROUND SHEET METAL

5. COMPONENT ARRANGEMENT MAY VARY BY MANUFACTURER. PROVIDE INSULATION W/ VAPOR BARRIER FOR CONNECTING DUCT SECTIONS.

MAIN SUPPLY

SHOWN, DOES NOT EXCEED 10 FEET. FOR LONGER LENGTHS, INCREASE THE DUCT SIZE AND PROVIDE A DUCT TRANSITION TO MAINTAIN THE DUCT STATIC

MINIMUM OF 3 TIMES THE DIAMETER OF INLET.

PRESSURE DROP AT OR BELOW 0.2"/100'.

CHANGE OF DIRECTION GREATER THAN 45°.

SEE NOTE 2

SEE NOTE 3

SEE SPECIFICATIONS FOR CLAMPS AND SEALANT (TYP.)

\M002 / N.T.S.

FLEXIBLE AIR DUCT-

CONNECTOR; SEE

DATE DESCRIPTION

Drawn By: 44-13-01-06-0-017-014 Proj. #: 187-2302.01 CSArch Proj. #: Issued for Bid:

Sheet Title **MECHANICAL**

SCHEDULES & **DETAILS**

CONSTRUCTION DOCUMENTS

ENERGY RECOVERY VENTILATOR SCHEDULE FRESH EXHAUST ROOM EXH. AIR (°F) OUTSIDE AIR (°F) SUPPLY AIR (°F) RECOVERY EFFECTIVENESS ELECTRICAL DATA AIR FLOW | AIR FLOW | WINTER | SUMMER | WINTER | SUMMER | WINTER | SUMMER | MOTOR NOTES VOLT. PHASE Hz. MCA MOCP (LB) FURNISH W/ MERV 8 FILTERS, ECM MOTOR, 70.0 | 54.4 | 75.0 | 62.6 | 0.0 | -2.0 | 95.0 | 75.0 | 53.8 | 44.1 | 79.4 | 68.0 | 76.8% 76.8% DISCONNECT SWITCH, 24" INSULATED ROOF CURB & BACKDRAFT DAMPERS:

						D	UCT	ED HO	OT WA	ATER (COII	L SCE	IEDU	LE					
	EQUIPMENT TAG	MANUFACTURER (OR ACCEPT. EQUAL)	MODEL	AIRFLOW (CFM)	AIR PRESS. DROP (IN. W.C.)	EFT (°F)	LFT (°F)	CAPACITY (MBH)	E.A.T. DB (°F)	L.A.T. DB (°F)	FPD (FT)	FLOW RATE (GPM)	ROWS	FIN HEIGHT (IN)	FIN LENGTH (IN)	COIL HEIGHT (IN)	COIL LENGTH (IN)	OVERALL LENGTH (IN)	NOTES
Γ	HWC-1	TRANE	D5WB12012G0AA142EABA00A	300	0.35	180	160	11.78	53.8	90	0.02	1.18	1	12	12	13.5	13.375	26	-

ľ							INI	000	R MIN	JI-SF	LIT	UNIT	SCHED	ULE	1			
EQUIPME	MANUFACTURER (OR ACCEPT.	MODEL	MINI-SPLIT UNIT	AREA OF BUILDING	AIRFLOW	CAPACITY	COOLING		CAPACITY	EATING EDB	EWB	PAIRED OUTDOOR	EXTERNAL STATIC		ELECTRICAL POWER REQUIREMEN		WEIGHT	NOTES
TAG	EQUAL)		TYPE	SERVED	(CFM)	(MBH)	(°F)	(°F)	(MBH)	(°F)	(°F)	UNIT	PRESSURE (IN. W.C.)		PHASE Hz.	W	(LB)	110120
FCU-1	TRANE	TPLFYP008FM104A	CEILING RECESSED UNIT	NURSE'S SUITE	315	8	80.0	67.0	9	70.0	60.0		-	208	1 60	50	28.9	PROVIDE W/ BUILT IN CONDENSATE PUMP
FCU-2	TRANE	TPLFYP008FM104A	CEILING RECESSED UNIT	CONFERENCE ROOM	315	8	80.0	67.0	9	70.0	60.0		-	208	1 60	50	28.9	PROVIDE W/ BUILT IN CONDENSATE PUMP
FCU-3	TRANE	TPLFYP008FM104A	CEILING RECESSED UNIT	ASSISTANT PRINCIPAL	315	8	80.0	67.0	9	70.0	60.0		-	208	1 60	50	28.9	PROVIDE W/ BUILT IN CONDENSATE PUMP
FCU-4	TRANE	TPLFYP012FM140A	CEILING RECESSED UNIT	MAIN OFFICE	335	12	81.0	66.0	13.5	68.0	60.0	HP-1	-	208	1 60	50	31.3	PROVIDE W/ BUILT IN CONDENSATE PUMP
FCU-5	TRANE	TPLFYP008FM104A	CEILING RECESSED UNIT	SECURITY OFFICE	315	8	80.0	67.0	9	70.0	60.0		-	208	1 60	50	28.9	PROVIDE W/ BUILT IN CONDENSATE PUMP
FCU-6	TRANE	TPLFYP008FM104A	CEILING RECESSED UNIT	OFFICE	315	8	80.0	67.0	9	70.0	60.0		-	208	1 60	50	28.9	PROVIDE W/ BUILT IN CONDENSATE PUMP
FCU-7	TRANE	TPLFYP012FM140A	CEILING RECESSED UNIT	PRINCIPAL	335	12	81.0	66.0	13.5	68.0	60.0		-	208	1 60	50	31.3	PROVIDE W/ BUILT IN CONDENSATE PUMP

								AIR-COOI	LED	H	ЕАТ	T PUMP SO	CHED	ULE						
	EQUIPMENT TAG	MANUFACTURER (OR ACCEPT. EQUAL)	MODEL	INDOOR UNITS SERVED	COMPRESSOR TYPE	NOM. COOL CAPACITY (MBH)	CAPACITY (MBH)	OUTDOOR OPERATING TEMP. RANGE (°F) COOLING HEATING	F	EFFICII RATING: IEER	S	REFRIGERANT	SOUND PRESSURE LEVEL COOLING/ HEATING (dBA)	VOLT. P	PC REQUI		NTS	MOCP	WEIGHT (LB)	NOTES
į[HP-1	TRANE	TUHYH0723AN40AN	FCU-1 THRU FCU-7	INVERTER SCROLL HEMETIC	72	80	23 TO 126 -22 TO 60	13.1	27.2	4.39	R410A	55/57	208	3	60	38	60	609	FURNISH W/ REQUIRED PIPING ACCESSORIES

1. FAN GUARD FROM TRANE IS TO BE USED IN COMBINATION WITH THIS DEVICE, MUST BE MOUNTED 12' OF GROUND OR 12" ABOVE HIGHEST AVERAGE SNOW DEPTH, WHICHEVER IS GREATER

				AI	R GR	ILLE/DIF	FUSER	SCHEDULE	\exists				
EQUIPMENT TAG	MANUFACTURER (OR ACCEPT. EQUAL)	MODEL	AIR DEVICE TYPE	AIRFLO	OW (CFM) MAX.	MAX AIR PRESS. DROP (IN. W.C.)	MOUNTING	PANEL/FRAME SIZE (IN.)	NECK SIZE (IN.)	MAX NC	DAMPER	FINISH	NOTES
D-1	KRUEGER	PLQ-6-F23-24x24-PR10-IB-44	SQUARE PLAQUE FACE DIFFUSER	50	175	0.10	LAY-IN	24"x24"	6"Ø	20	OBD	WHITE	PROVIDE W/ INSULATED BLANKET ON BACKPAN
D-2	KRUEGER	PLQ-8-F23-24x24-PR10-IB-44	SQUARE PLAQUE FACE DIFFUSER	176	300	0.10	LAY-IN	24"x24"	8"Ø	20	OBD	WHITE	PROVIDE W/ INSULATED BLANKET ON BACKPAN
R-1	KRUEGER	S80P-20x20-F23-24x24-00-00-00-44	PERFORATED FACE RETURN GRILLE	0	1,600	0.10	LAY-IN	24"x24"	20"x20"	25	-	WHITE	FURNISH & INSTALL FULL-SIZE SHEET METAL PLENUM BOX ON REAR OF GRILLE, PAINT INSIDE FLAT BLACK

							FII	NNED 7	ΓUBE S	CHEDI	JLE			
EQUIPMENT TAG	MANUFACTURER (OR ACCEPT. EQUAL)	MODEL	AVG WATER TEMP (°F)	BTU/FT		ELEMENT TUBE MATERIAL		FINS PER FT	ACTIVE FIN LENGTH	ROW QUANTITY	ENCLOSURE MATERIAL	FINISH	COLOR	NOTES
FT-1	STERLING	JVB-S 24	150	860	3/4	COPPER	4-1/4 X 3-5/8	40	(2) 7FT SECTIONS	1	16 GAUGE STEEL	STANDARD PRIME FINISH		PROVIDE W/ REMOVE 12" ACCESS PANEL AT EACH END PROVIDE W/ FULL SIZE BACK PLATE AND MOUNTING BRACKETS

					FA1	N SCHEDU	LE					
EQUIPMENT	MANUFACTURER	MODEL	SERVICE	FAN	R.P.M.	EXTERNAL STATIC PRESSURE		M	OTOR			REMARKS
TAG	WINTER	MODEL	ozittioz	C.F.M.	13.1 .141.	INCH H ₂ O	POWER (HP)	FLA	VOLT.	PHASE	HZ.	
EF-1	GREENHECK	G-133-VG	CLASSROOM	500 (1,500)	818	0.25	1/4	3.7	120	1	60	PROVIDE W/ FAN SPEED CONTROLLER, 24" HIGH INSULATED ROOF CURB & BACKDRAFT DAMPER
EF-2	GREENHECK	G-133-VG	CLASSROOM	500 (1,500)	818	0.25	1/4	3.7	120	1	60	PROVIDE W/ FAN SPEED CONTROLLER, 24" HIGH INSULATED ROOF CURB & BACKDRAFT DAMPER
EF-3	GREENHECK	G-090-VG	TOILET ROOM	150	1,336	0.25	1/4	2.6	120	1	60	PROVIDE W/ FAN SPEED CONTROLLER, 24" HIGH INSULATED ROOF CURB & BACKDRAFT DAMPER

					V	ENII	LATIO.	N SCHE	DULE						
SYSTEM	SPACE SERVED	SPACE TYPE	SPACE AREA (SQ. FT.)	OCCUPANTS PER 1000 SQ. FT.	# OF OCCUPANTS (NOTE 1)	CFM PER PERSON	CFM PER SQ. FT.	CALCULATED VENTILATION RATE (CFM)	ZONE AIR DISTRIBUTION EFFECTIVENESS	ADJUSTED VENTILATION RATE (CFM)	PROVIDED VENTILATION RATE (CFM)	EA CFM PER FIXTURE	EA CFM PER SQ. FT.	MIN. EA RATE (CFM)	EA PROVIDE (CFM)
	NURSE'S SUITE 121	OFFICE/ SICKROOM	435	10	5	10	0.18	128	0.8	160	160	-	-	-	-
	MGT/PT ROOM 122J	CONFERENCE ROOM	194	10	50	5	0.06	62	0.8	77	80	-	-	-	-
	ASSISSTENT PRINCIPAL'S 1228	OFFICE	204	5	2	5	0.06	22	0.8	28	30	-	-	-	-
ERV-1	MAIN OFFICE 122A	RECEPTION AREA	522	30	16	5	0.06	111	0.8	139	140	-	-	-	-
	SECURITY OFFICE 122E	OFFICE	73	5	1	5	0.06	9	0.8	12	15	-	-	-	-
	OFFICE 122D	OFFICE	114	5	1	5	0.06	12	0.8	15	15	-	-	-	-
	PRINCIPAL'S OFFICE 122C	OFFICE	266	5	2	5	0.06	26	0.8	32	35	-	-	-	-
	KINDERGARTEN 160	CLASSROOM (AGES 5-8)	876	25	30	10	0.12	325	0.8	507	510	-	-	-	-
EXISTING	KINDERGARTEN 161	CLASSROOM (AGES 5-8)	872	25	30	10	0.12	325	0.8	507	510	-	-	-	-
RTU	COUNSELOR	OFFICE	198	5	1	5	0.06	17	0.8	21	25	-	-	-	-
	COPY ROOM	COPY, PRINTING	299	4	2	5	0.06	28	0.8	35	35	-	-	-	-

1. QUANTITY OF OCCUPANTS FOR STANDARD CLASSROOMS ARE 25 TO 30 OCCUPANTS BASED ON NYSED STATISTICAL DATA. ALL OTHER OCCUPANCIES ARE BASED UPON OCCUPANT DENSITIES FROM THE 2015 INTERNATIONAL MECHANICAL CODE

				AIR T	ERMIN	AL U	JNIT	SCH	IEDUI	E						
									HYD	RONIC R	EHEAT C	OIL				
EQUIPMENT TAG	MANUFACTURER	MODEL	MAXIMUM PRIMARY CFM	MINIMUM PRIMARY CFM	SENSOR SP	HEAT CFM	EAT DEG F	LAT DEG F	CAPACITY MBH	EWT DEG F	LWT DEG F	COIL APD FT. W.G.	WATER GPM	COIL ROWS	WPD FT. W.G.	NOTES
VAV-1	KRUEGER	LMHS	1,500	510	-	1,125	55	90	42.5	180	160	0.23	4.0	2	1.17	1 - 4
VAV-2	KRUEGER	LMHS	1,500	510	-	1,125	55	90	42.5	180	160	0.23	4.0	2	1.17	1 - 4

- PROVIDE WITH HOT WATER REHEAT COIL OF SIZE & CAPACITY SPECIFIED PROVIDE W/ FACTORY INSTALLED AIRFLOW MEASURING SENSOR
- PROVIDE W/ BACNET COMPATIBLE DDC CONTROLLER 4. PROVIDE W/ FACTORY INSTALLED TOGGLE DISCONNECT SWITCH

EQUIPMENT | MANUFACTURER

TAG

ERV-1

(OR ACCEPT. EQUAL)

RENEWAIRE

MODEL

HE07-JRTV-D11AA--DGNTF--L

RATE

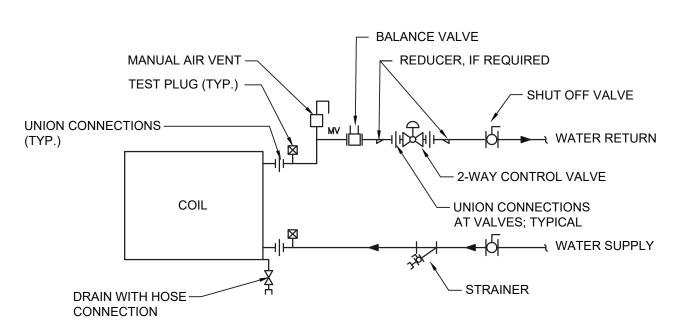
(CFM)

(CFM)

- ENERGY RECOVERY VENTILATOR, HOT WATER COIL & VRF SYSTEM FURNISHED BY OWNER, INSTALLED BY CONTRACTOR; CONTRACTOR IS RESPONSIBLE TO RECEIVE THE EQUIPMENT DELIVERY AT THE PROJECT SITE, MOVE EQUIPMENT FROM TRUCK(S) TO A DESIGNATED STORAGE LOCATION ON THE SITE & RIG THE UNIT INTO THE FINAL INSTALLATION LOCATION: CONTRACTOR IS TO PROVIDE ALL ASSOCIATED COMPONENTS, I.E., DUCTWORK, PIPING, CONTROLS, ACCESSORIES, ETC. UNLESS OTHERWISE NOTED IN THE PROJECT DOCUMENTS; REFER TO FRONT END DOCUMENTS FOR ADDITIONAL INFORMATION

VRF System Notes:

- 1. WIRED 7 DAY PROGRAMMABLE THERMOSTAT SHALL BE FURNISHED BY OWNER FOR EACH INDOOR UNIT. THERMOSTATS SHIP LOOSE FOR FIELD INSTALLATION AND WIRING BY THE MECHANICAL CONTRACTOR.
- OWNER TO FURNISH CENTRAL CONTROLLER FOR LOCAL SET POINT CONTROL AND SYSTEM VIEWING. CONTROLLER TO BE INSTALLED AND WIRING BY MECHANICAL CONTRACTOR. 24V POWER BY ELECTRICAL CONTRACTOR.
- DISCONNECT SWITCHES FOR CONDENSING UNITS AND INDOOR UNITS SHALL BE FURNISHED BY THE OWNER AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- 4. EXTERNAL SUPPORTS FOR INDOOR AND CONDENSING UNITS SHALL BE FURNISHED BY OWNER AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- 5. FILTER RACK AND 2" PLEATED MERV-13 FILTERS FOR DUCTED UNITS SHALL FURNISHED BY OWNER AND INSTALLED BY THE MECHANICAL CONTRACTOR. FILTER RACK SHALL BE GALVANIZED STEEL, FULLY INSULATED & FACTORY ASSEMBLED. TYPICAL OF FLT-H SERIES OR EQUAL
- CONDENSATE PUMPS SHIP FOR FIELD INSTALLATION BY MECHANICAL CONTRACTOR FOR WALL MOUNTED UNITS. DUCTED UNITS FURNISHED WITH FACTORY MOUNTED CONDENSATE PUMP. MECHANICAL CONTRACTOR TO PROVIDE CONDENSATE PIPING FROM ALL UNITS TO SANITARY DRAIN. FIELD VERIFY EXACT ROUTING AND TERMINATION POINT IN
- PROVIDE REFRIGERANT ISOLATION VALVES ON LIQUID AND GAS LINES AT EVERY FAN COIL UNIT.



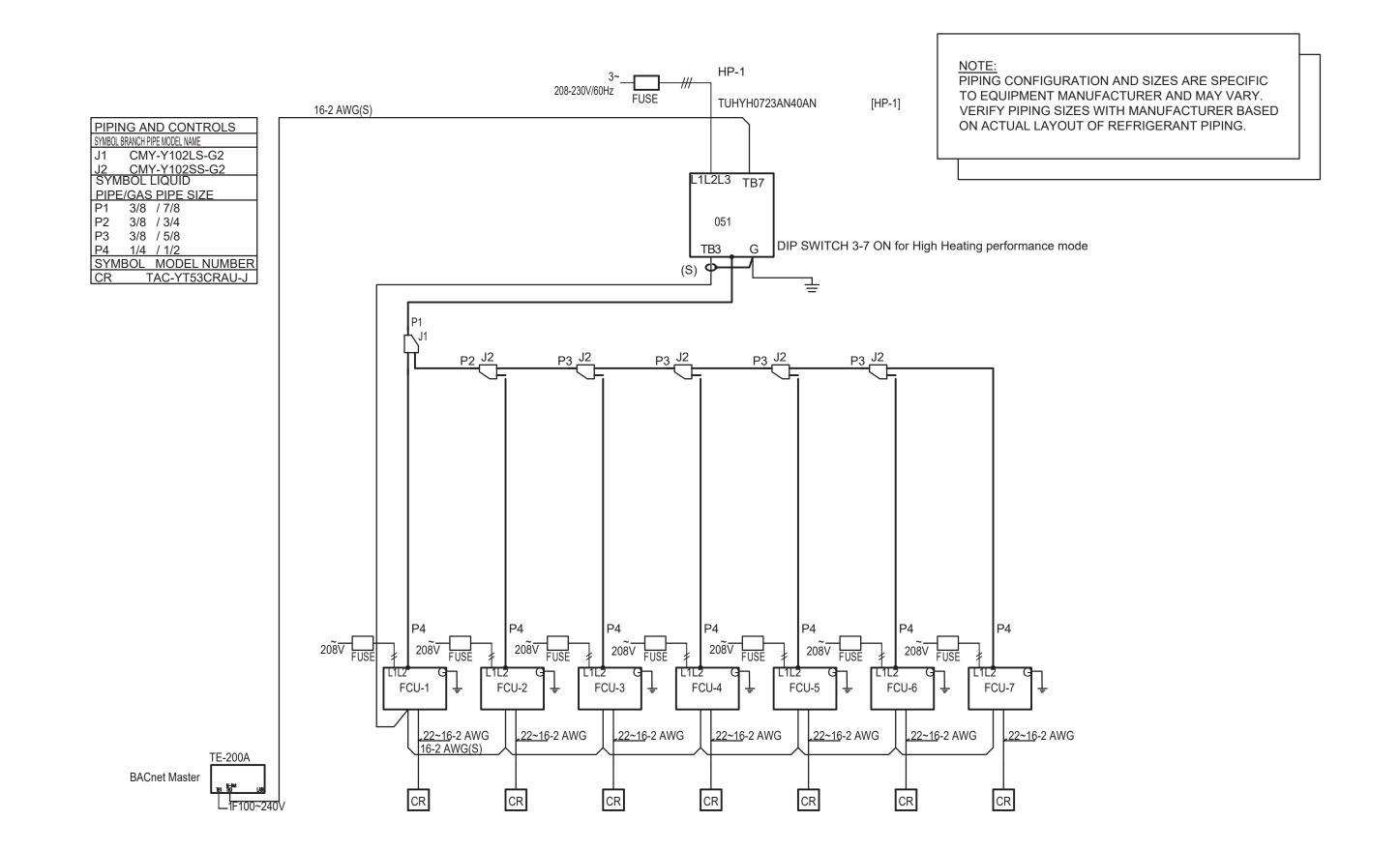
Coil Piping Connection Detail M002 Scale: None

DDC Temperature Control Notes:

- 1. HVAC CONTROLS SHALL BE FURNISHED & INSTALLED BY THE OWNER TO MATCH THE EXISTING BUILDING AUTOMATION SYSTEM IN EACH BUILDING (SIEMENS AT BEREA ELEMENTARY). ALL HARDWARE, WIRING AND PROGRAMMING TO BE PROVIDED BY OWNER. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE OWNER'S VENDOR THROUGHOUT THE PROJECT TO SUPPORT INSTALLATION, TESTING AND COMMISSIONING. MECHANICAL CONTRACTOR TO INSTALL ALL DEVICES MOUNTED IN OR ON THE PIPING AND/OR DUCTWORK INCLUDING BUT NOT LIMITED TO HYDRONIC CONTROL VALVES, TEMPERATURE SENSORS, FLOW SENSORS, ETC. MECHANICAL CONTRACTOR TO PROVIDE ALL NECESSARY PORTS/THERMOWELLS FOR SENSORS, GAUGES, ETC. COORDINATE
- 2. OWNER SHALL EXPAND EXISTING BUILDING AUTOMATION SYSTEM TO PROVIDE THE CONTROL SEQUENCES SPECIFIED ON THE DRAWINGS AND IN THE SPECIFICATIONS. THE SYSTEM SHALL PROVIDE CONTROL AND MONITORING OF THE EQUIPMENT INDICATED.

WITH OWNER'S VENDOR FOR QUANTITY AND LOCATIONS.

- 3. OWNER SHALL PROVIDE CONTROLLERS AND COMMUNICATIONS INFRASTRUCTURE TO MATCH EXISTING CAMPUS-WIDE BUILDING AUTOMATION SYSTEM. PROVIDE SEAMLESS INTEGRATION WITH EXISTING CONTROL NETWORK AND USER INTERFACES. NETWORK GATEWAYS AND PROTOCOL INTERFACE EQUIPMENT ARE NOT
- ACCEPTABLE UNLESS OTHERWISE NOTED. 4. OWNER SHALL PROVIDE INSTRUMENTATION, SENSORS, VALVES, DAMPERS, ACTUATORS AND WIRING AS REQUIRED TO PROVIDE SPECIFIED OPERATING SEQUENCES.
- 5. OWNER SHALL MODIFY EXISTING GRAPHIC USER INTERFACES TO INCLUDE ALL EQUIPMENT AND SYSTEMS INCLUDED IN THIS PROJECT.
- 6. OWNER SHALL REPLACE THE EXISTING BAS SERVER HARDWARE AND UPGRADE THE SOFTWARE TO THE LATEST VERSION OF WEB-ENABLED GRAPHICAL USER INTERFACE WITH A SEAMLESS INTEGRATION OF THE NEW AND EXISTING CONTROL POINTS.
- 7. OWNER SHALL BE RESPONSIBLE FOR POWER THAT IS NOT SHOWN ON THE ELECTRICAL DRAWINGS, TO CONTROLS FURNISHED BY THIS CONTRACTOR. IF POWER CIRCUITS ARE SHOWN ON THE ELECTRICAL DRAWINGS, OWNER SHALL CONTINUE THE POWER RUN TO THE CONTROL DEVICE. IF POWER CIRCUITS ARE NOT SHOWN, OWNER SHALL PROVIDE BREAKERS AT DISTRIBUTION PANELS FOR POWER TO CONTROLS AND PROVIDE POWER FROM THE DISTRIBUTION PANEL TO THE CONTROL DEVICES.
- 8. OWNER SHALL FURNISH & INSTALL ALL REQUIRED END DEVICES, POWER SUPPLY, LOW VOLTAGE TRANSFORMERS, CONTROL WIRING & CONDUITS, ETC. FOR A COMPLETE & OPERATIONAL DDC CONTROL
- 9. NEW WIRING & CONDUITS SHALL BE RUN CONCEALED ABOVE CEILING. ALL EXPOSED WIRING & CONDUITS SHALL BE RUN CONCEALED IN EMT IN UTILITY SPACES AND WIREMOLD IN FINISHED AREAS.
- 10. OWNER TO FIELD INSTALL SENSORS, CONTROLLERS, ETC. WHICH ARE NOT FACTORY-INSTALLED BY EQUIPMENT MANUFACTURERS.
- 11. ANY EQUIPMENT FURNISHED WITH FACTORY CONTROLS SHALL BE PROVIDED WITH BACNET MSTP INTEGRATION CAPABILITIES AND INCLUDE ON-SITE FACTORY CONTROLS INTEGRATION START-UP IN COORDINATION WITH OWNER'S BUILDING AUTOMATION SYSTEM.



VRF System Piping Diagram