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SV	STEAM VENT
——HWS ——	HEATING-HOT WATER SUPPLY
——HWR ——	HEATING-HOT WATER RETURN
— снs —	CHILLED WATER SUPPLY
— CHR —	CHILLED WATER RETURN
——HCS ——	HOT/CHILLED WATER SUPPLY
——HCR ——	HOT/CHILLED WATER RETURN
——В ——	BRINE SUPPLY
——BR ——	BRINE RETURN
————D ————	CONDENSATE DRAIN
C	COLD CONDENSER WATER
CR	HOT CONDENSER WATER
——MU ——	MAKE-UP WATER
——HG ——	REFRIGERANT HOT GAS
——	REFRIGERANT SUCTION
——RL ——	REFRIGERANT LIQUID
CP	CONDENSATE PUMP DISCHARG
——BFW ——	BOILER FEEDWATER
—— BD ——	BOILER BLOW DOWN
——FOS ——	FUEL-OIL SUPPLY
——FOR ——	FUEL-OIL RETURN
——FOV ——	FUEL-OIL VENT
——	REHEAT HOT WATER SUPPLY
——	REHEAT HOT WATER RETURN
—— LPS ——	LOW PRESSURE STEAM
——LPC ——	LOW PRESSURE CONDENSATE
——PSC ——	PUMPED STEAM CONDENSATE
	STEAM TRAP
DS	DRIP STATION
—P.R.S	PRESSURE REDUCING STATION

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HEATING-HOT WATER RETURN
CHILLED WATER SUPPLY
CHILLED WATER RETURN
HOT/CHILLED WATER SUPPLY
HOT/CHILLED WATER RETURN
BRINE SUPPLY
BRINE RETURN
CONDENSATE DRAIN
COLD CONDENSER WATER
HOT CONDENSER WATER
MAKE-UP WATER
REFRIGERANT HOT GAS
REFRIGERANT SUCTION
REFRIGERANT LIQUID
CONDENSATE PUMP DISCHARGE
BOILER FEEDWATER
BOILER BLOW DOWN
FUEL-OIL SUPPLY
FUEL-OIL RETURN
FUEL-OIL VENT
REHEAT HOT WATER SUPPLY
REHEAT HOT WATER RETURN
LOW PRESSURE STEAM
LOW PRESSURE CONDENSATE
PUMPED STEAM CONDENSATE
STEAM TRAP
DRIP STATION
PRESSURE REDUCING STATION

	MISC SYMBOLS	
0000	ROOM NUMBER	300x150
ø	ROUND DUCT	1500ø
	FLAT OVAL DUCT	900x450A
	POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK	
	POINT BETWEEN EXISTING WORK TO REMAIN AND EXISTING WORK TO BE REMOVED WATER SENSOR (LOCATED BELOW ACCESS FLOOR)	
HD	HEAT DETECTOR	
SD	SMOKE DETECTOR	
DPS	DIFFERENTIAL PRESSURE SENSOR	BDD
VFD	VARIABLE FREQUENCY DRIVE	I
ATFP	ANTI TERRORISM / FORCE PROTECTION SWITCH	
M	METER	-
	INTERVAL TIMER	, D
(\mathbf{H})	HUMIDISTAT	
T	THERMOSTAT	$\left \left(\frac{R}{R} \right) \right $
(\mathbb{N})	NIGHT THERMOSTAT	
S	WALL SWITCH	
	FUEL VAPOR SENSOR AIR DEVICE TYPE (SEE AIR DEVICE SCHEDULE) AIR DEVICE AIRFLOW (CFM)	
	FLOW ARROWS INDICATE AIRFLOW DIRECTION (WHEN LESS THAN 4-WAY THROW)	

			DOUBLE LINE D	UCTWORK SYMBOLS	
× PA	PIPE ANCHOR	1			
PG	PIPE GUIDE OR SLEEVES	12x6	RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT	TAP-IN BRANCH, RECTANG	ЗU
	EXPANSION JOINT		SHOWN)		
	VENTURI GATE VALVE) 12"ø			
	GLOBE VALVE	(BRANCH DUCT, CONICAL FITTING. ROUND OR FLAT	LA Oʻ
—-[X]-] 	HOSE VALVE WITH CAP	12x6⊖	FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE		- 1
	BUTTERFLY VALVE		SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)	BRANCH DUCT, CONICAL T	ΓEI
	CHECK VALVE	+++++++++++++++++++++++++++++++++++++++	FLEXIBLE ROUND DUCT		
					G,
 PICBV	CALIBRATED BALANCING VALVE		FLEXIBLE DUCT CONNECTION		
	CONTROL AND BALANCING VALVE	FFFFFFFFFFFFF	<u>DAMPERS</u> 3FD: 3HR FIRE DAMPER	SUPPLY DUCT SECTION	
⊳	AUTOMATIC FLOW CONTROL VALVE		BDD: BACKDRAFT DAMPER FSD: FIRE/SMOKE DAMPER	RETURN/EXHAUST DUCT S	3E(
	BALL VALVE		FD: FIRE DAMPER MD: MOTORIZED DAMPER		
\neg			SD: SMOKE DAMPER VD: VOLUME DAMPER		EC
S			SP: SECURE PENETRATION	90°ELBOW TURNED DOWN	N,
—— × ——— 見		257	DUCT TRANSITION, ROUND OR FLAT OVAL TO RECTANGULAR		
Ţ.	SAFETY OR PRESSURE RELIEF, ANGLE VALVE		DUCT TRANSITION, RECTANGULAR TO	90° ELBOW TURNED UP, R	οι
——————————————————————————————————————	SAFETY OR PRESSURE RELIEF, STRAIGHT THRU VALVE	P P	ROUND OR FLAT OVAL	90° ELBOW TURNED DOWN	N,
	PRESSURE REDUCING VALVE (PRV)		DUCT TRANSITION, RECTANGULAR, ROUND, OR		
	AUTOMATIC CONTROL VALVE, 2 WAY		FLAT OVAL	90° ELBOW TURNED UP, FI	LA
	AUTOMATIC CONTROL VALVE, 3 WAY		INCLINED RISE W/RESPECT TO AIR FLOW,	top top	
	BLIND FLANGE		` RECTANGULAR	90° ELBOW TURNED DOWN	∖, ∣
-+	LATERAL Y		INCLINED DROP W/RESPECT TO AIR FLOW,		/т
]	САР		* RECTANGULAR		Ϋ́́
	ELBOW, 90°	$\left(\left \left(\left R \right - \left(\left \right\rangle \right) \right \right) \right \right)$	INCLINED RISE W/RESPECT TO AIR FLOW,	CEILING DIFFUSER (4-WAY	ΥT
o					Ϋ́́́́́́
,	ELBOW 90, TURNED DUWN	<u> </u>	OR FLAT OVAL	CEILING REGISTER OR GR	۱L
<u> </u>	TEE		90° ELBOW RECTANGUI AR WITH TURNING VANES		-
	TEE, OUTLET TURNED UP				ILI
	TEE, OUTLET TURNED DOWN			REGISTER OR GRILLE	
	CONCENTRIC REDUCER		45 ELBOW, RECTANGULAR		-1
			90° ELBOW, ROUND OR ELAT		FL 70
	ECCENTRIC REDUCER (STRAIGHT INVERT) UNION		OVAL (SMOOTH OR 5 PIECE ELBOWS)		3Y .
	FLEXIBLE PIPE CONNECTION				EΧ
\oslash			MITERED 90° ELBOW, ROUND OR FLAT OVAL	NUMBER INDICATES CFM	E
,Ĭ ,	SIPHON OR PULSATION DAMPENER.			CEILING LINEAR SLOT OR	IN
Т			45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3 PIECE ELBOWS)	DIFFUSER (CLSD) WITH FI	LE. NE
	TEMPERATURE GAGE			SPS ' DIRECTIONS)	
	THERMOMETER		N DIVIDED FLOW FITTING	STATIC PRESSURE SENSC)R
TPT					
	DOUBLE CHECK VALVE BACKFLOW	4			
	PREVENTER		DUCT W/LINING (SPECIFIED WHEN SHOWN TYPICAL RECTANGULAR, ROUND, OVAL) SEE	(<u>H</u>)	
			MECHANICAL GENERAL NOTE 4.		
	SINGLE LINE DUCT	WORK SYMI	BOLS	SYSTEM TYPES AND ABB	R
300x150					
0000100	FOR SIDE SHOWN, SECOND FIGURE IS	(PIECE ELBOWS)	SA SUPPLY AIR DUCT (SA)	
1500ø	- ROUND DUCT		45° ELBOW, RECTANGULAR		
900x450 0	FLAT OVAL DUCT (FIRST FIGURE IS FOR		45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3-	EA EXHAUST AIR DUCT (EA)	
	SIDE SHOWN, SECOND FIGURE IS FOR				
\frown	✓ FLEXIBLE ROUND DUCT	DF		RA RETURN AIR DUCT (RA)	
	- FLEXIBLE DUCT CONNECTION		OVAL CONICAL TEE		
1 1			INCLINED CONICAL TAKE-OFF, ROUND OR	OA OUTDOOR (FRESH) AIR DUC	ст
	DAMPERS BDD: BACKDRAFT DAMPER	·	"Y" FITTING. ROUND OR FLAT OVAL		
BDD	FSD: FIRE/SMOKE DAMPER - FD: FIRE DAMPER			MUA MAKEUP (COMBUSTION) AIF	R C
T	MD: MOTORIZED DAMPER SD: SMOKE DAMPER		90° ELBOW TURNED UP, RECTANGULAR		
	VD: VOLUME DAMPER		90° ELBOW TURNED, DOWN, RECTANGULAR	REL RELIEF AIR DUCT (REL)	
-	- DUCT TRANSITION		90° ELBOW TURNED UP, ROUND, FLAT OVAL		
	- INCLINED RISE W/RESPECT TO AIR		SIMILAR 90° ELBOW TURNED DOWN, ROUND, FLAT OVAL	TA TRANSFER AIR DUCT (TA)	
			SIMILAR		
	FLOW, RECTANGULAR		CEILING DIFFUSER (ARROWS INDICATE		
	- INCLINED RISE W/RESPECT TO AIR		THROW DIRECTIONS)		
			CEILING REGISTER OR GRILLE, RETURN		
	 INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL 	——————————————————————————————————————	CEILING REGISTER OR GRILLE, SUPPLY		
	90° ELBOW, RECTANGULAR WITH		STATIC PRESSURE SENSOR		
I	TURNING VANES	SPS			

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		MECHANICAL GENERAL NOTES
ANGULAR	1.	SEE SH G-002 FOR ABBREVIATIONS, CHARACTER IDENTIFIERS IN LINES ON PIPING LEGEND ARE ALSO USED FOR ABBREVIATIONS.
AL LATERAL AT OVAL	2.	MECHANICAL LAYOUTS ARE SCHEMATIC. PROVIDE ANY ADDITIONAL DROPS, RISES, OR
AL TEE FITTING,		INSTALLATION, COORDINATE EXACT ROUTING OF WORK WITH ALL OTHER TRADES AND
ING, ROUND OR		GRID, AND OTHER OBSTRUCTIONS.
J	3.	UNLESS OTHERWISE INDICATED, ROUTE ALL DUCTWORK AND PIPING ABOVE CEILINGS. ROUTE ALL DUCTWORK AND PIPING AS HIGH AS
TSECTION	Λ	POSSIBLE IN AREAS WITHOUT CEILINGS.
, RECTANGULAR	4.	DIMENSIONS ARE INSIDE CLEAR DIMENSIONS. INCREASE SHEET METAL DIMENSIONS ON LINED DUCTWORK TO MAINTAIN
WN, RECTANGULAR	_	THE INSIDE CLEAR DIMENSIONS INDICATED.
, ROUND WN, ROUND	5.	UNLESS OTHERWISE INDICATED, PROVIDE DUCT RUNOUTS TO TERMINAL UNITS SAME SIZE AS TERMINAL UNIT CONNECTION OR AIR DEVICE
, FLAT OVAL	6.	SIZE FLEXIBLE DUCT RUNOUTS TO TERMINAL AIR DEVICES AS FOLLOWS:
WN, FLAT OVAL		SIZE CFM
/AY THROW UNLESS E BY ARROWS)		5"ø 0-65 6"ø 70-110
AY THROW UNLESS BY ARROWS)		7"ø 115-160 8"ø 165-240
GRILLE (RETURN)		9"ø 245-320 10"ø 325-420
GRILLE (SUPPLY)		12"ø 425-700
TH FLEXIBLE DUCT THROW UNLESS E BY ARROWS)	7.	INSTALL CALIBRATED BALANCING VALVES AND VENTURIS WITH A MINIMUM UNRESTRICTED STRAIGHT RUN OF 5 PIPE DIAMETERS UPSTREAM AND 3 PIPE DIAMETERS DOWNSTREAM.
FLEXIBLE DUCT CATES SOFFIT, FM	8.	SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DIFFUSERS, LINEAR SLOT DIFFUSERS, REGISTERS, AND
H FLEXIBLE DUCT	0	GRILLES.
ISOR	9.	EXISTING WORK BEFORE PURCHASING OR FABRICATING NEW WORK FOR CONNECTION TO OR INSTALLATION IN EXISTING WORK. VERIFY INTEGRITY OF EXISTING CHILLED WATER, HOT WATER, STEAM, AND STEAM CONDENSATE SYSTEMS BEFORE MAKING CONNECTIONS.
	10.	SOME SYMBOLS INDICATED ON THIS LEGEND SHEET MAY NOT APPEAR ON THE DRAWINGS.
DREVIATIONS	11.	DO NOT LOCATE MECHANICAL WORK IN ELECTRICAL OR COMMUNICATION ROOMS, EXCEPT FOR RUNOUTS SPECIFICALLY SERVING THE RESPECTIVE ROOM.
	12.	DUCTS CROSSING WALLS WITH A RATING OF ONE-HOUR OR LESS SHALL HAVE GALVANIZED DUCTWORK OF AT LEAST 1.2 MM THICK.
DUCT (OA)		
AIR DUCT (MUA)		
N)		

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VT UNIVERSITY BUILDING OFFICIAL APPROVAL STAMP





23.01	DEMOLISH EXISTING FAN COIL UNITS, AIR DEVICES, DUCT WORK, CONDENSATE DRAIN PIPING, AND TEMPERATURE CONTROLS ON THE SECOND FLOOR. CUT AND CAP HW RUNNOUTS AS INDICATED. DEMOLISH FCU CHW RUNNOUTS AND PORTIONS OF CHW MAINS AS INDICATED. RELOCATION RTU-2 EXISTING THERMOSTAT, REFER TO MP101. HW AND STEAM PIPING MAINS ARE TO REMAIN IN PLACE AS INDICATED.
23.02	DEMOLISH EXISTING TOILET EXHAUST FANS AND ITS ASSOCIATED DUCTWORK.
23.03	DEMOLISH EXISTING LPS AND LPC FROM LAUNDRY EQUIPMENT BACK TO MAIN.





23.04	DEMOLISH EXISTING ROOFTOP AIR HANDLING UNIT SERVING THE 2ND FL.
23.05	DEMOLISH EXISTING EXHAUST FANS SERVING THE 2ND FL AND THEIR
00.40	ASSOCIATED DUCTWORK ON THE ROOF.
23.10	DEMOLISH EXISTING DUCTWORK.

VT UNIVERSITY BUILDING OFFICIAL APPROVAL STAMP

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GENERAL NOTES THIS SHEET

A. REFER TO SHEET M001 FOR MECHANICAL LEGEND AND GENERAL NOTES.

◯ <u>SHEET KEYNOTES:</u>

23.06	ROUTE SUPPLY AND RETURN DUCTWORK UP THROUGH EXISTING OPENING TO ROOFTOP AIR HANDLING UNIT RTU-1.
23.07	ROUTE SUPPLY AND RETURN DUCTWORK UP THROUGH EXISTING OPENING TO EXISTING ROOFTOP AIR HANDLING UNIT RTU-2.
23.13	LOCATE UH-2 IN ELEVATOR PIT AND UH-3 IN ELEVATOR ENTRANCE VESTIBLE. REFER TO FIRST FLOOR PARTIAL PLAN MH102/2. REFER TO ELEVATOR SPECIFICATION FOR ELEVATOR SHAFT VENTILATION REQUIREMENTS.
23.14	PROVIDE OPEN END OF RETURN DUCT WITH WIRE MESH SCREEN.
23.16	LOCATE RTU-1 DUCT DIFFERENTIAL PRESSURE SENSOR.

L J (**k**) —(**4**) (E)RAD <u>(E)RAD</u> <u>(E)UH</u> _____ 10x10— — — (**3**) <u>(E)RAD</u> STAIRCASE C1 10x10— C_____ ____ —(1 [`]

23.12	PROVIDE ROOFTOP UNIT WITH MANUFACTURER'S INSULATED PIPING CABINET. REFER TO ARCH DRAWINGS FOR FLASHING AND CABINET SCUPPER DRAIN DETAIL. PROVIDE ROOF PIPING PENETRATIONS WITH PIPE CURB, REFER TO M-501 DETAIL. LOCATE RTU-1 VFD AND UH-1 THERMOSTAT INSIDE OF CABINET.
23.15	ROUTE DUCTWORK DOWN TO 2ND FLOOR THROUGH EXISTING OPENING.
23.17	PROVIDE EXISTING PENETRATION WITH INSULATED GALVANIZED STEEL CAP.
23.18	LOCATE FAN OVER EXISTING OPENING AND ROUTE DUCTWORK THROUGH EXISTING OPENNING TO 2ND FLOOR.
23 23	DISCHARGE STEAM VENT WITH WEATHER

23.09 23.20	RELOCATE EXISTNG RTU-2 THERMOSTAT. CONNECT LPS TO STEAM EQUIPMENT AND ROUTE LPC DN TO GROUND FLOOR LPC RETURN SYSTEM.
23.21	CONNECT STEAM VENTS TO STEAM PRESSURE SAFETY VALVES, REFER TO DETAIL M-501/13.
23.22	ROUTE STEAM VENTS UP TO ROOF, REFER TO MH102.

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AIRFLOW

M-501

						ATER REHEAT	TING HOT WA	HEDULE (HE	RMINAL BOX SO	TEF								VICE SCHEDULE	AIR DEVIC			
					ATING DATA	HE			COOLING AIRF	ESIGN	BASIS OF D	Γ DATA	UNI			ENERAL DATA	G			SIGN	BASIS OF DES	UNIT DATA
AD.01 COLOR SELECTED BY ARCH AH.01 EXTERNAL STATIC PRESSU	ULE NOTES	SCHEDU	EAT LAT DB DB (°F) (°F)	VT LWT D F) (°F) (°	FLOW E (GPM) (CAPACITY (MBH)	AIRFLOW (CFM)	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	MODEL	MANUFACTURER	NECK SIZE (IN)	TAG	SCHEDULE NOTES	MAX NC	INTEGRAL VOLUME DAMPER	MATERIAL	NECK DIAMETER	FACE SIZE	MODEL	MANUFACTURER	TAG FUNCTION
AH.02 COOLING COIL CAPACITIES	2	TU.01, TU.02	5.0 81.4	0.0 150.0 55	1.2 18	18.11	675	1875	675	VCME	TRANE	14	TU-1	AD1	25	Yes	ALUMINUM	10	24 x 24	PSS-AA	TITUS	S3C CEILING SUPPLY
AH.03 COIL FACE VELOCITY SHAL	2	TU.01, TU.02	5.0 80.0 55.0 80.0	0.0 150.0 5	0.6 18	9.15	360	1140	360	VCME	TRANE	12	TU-3	AD1	25	Yes	ALUMINUM	12	24 x 24	PSS-AA	TITUS	S3D CEILING SUPPLY
EXCEED 0.37 FT WG.	2	TU.01, TU.02	5.0 87.9 5.0 82.5	0.0 150.0 5000 5000 5000 5000 5000 5000	0.8 18	7.00	250 200	765	250	VCME VCME	TRANE	12	TU-5	AD1	25	Yes	ALUMINUM	14	24 x 24	PSS-AA	TITUS	S3E CEILING SUPPLY
F.01 PROVIDE WITH VARIABLE S	2	10.01, 10.02	5.0 83.8	0.0 150.0 50	0.6	0.01	290	975	290	VGIVIE	TRAINE	10	10-6	AD1	25	Yes			24 x 24	50F	TITUS	R3B CEILING
TU.01 HOT WATER COIL CAPACITI														AD1	25	Yes	ALUMINUM		24 x 24	50F	TITUS	RETURN R3C CEILING
TU.02 MINIMUM INLET STATIC PRE						IC)	JLE (ELECTR		UNIT H					AD1	25	Yes			24 x 24	50F	TITUS	RETURN R3E CEILING
UH.01 UNIT HEATERS SHALL BE HC				DATA	ELECTRICA	,		PERFORMA	ESIGN	BASIS OF DE		UNIT DATA			20	Vee				505		RETURN
						CAPACITY	EAT LAT DB DB	AIRFLOW							25	Yes	ALUMINUM		24 X 24	50F	1105	R3F CEILING RETURN
	LE NOTES	SCHEDULE	PHASE	VOLTS PI	STAGES	(KW)	(°F) (°F)	(CFM)	MODEL	IANUFACTURER	YPE N	T	TAG	AD1	25	No	ALUMINUM		24 x 24	50F	TITUS	G3A CEILING RETURN
	.01	UH.(1	208	1	3.00	50.0 80.0	310	EGHB	REZNOR		HORI	UH-1									
	.01	UH.(1	208	1	2.00	50.0 80.0 50.0 70.0	300	CDF-548	QMARK	ITED RECESSED	CEILING MOUN	UH-3	AD1	25	Yes	ALUMINUM		10 x 10	300FL	TITUS	SR5 WALL SUPPLY
														AD1	25	Yes	ALUMINUM		12 x 8	300FL	TITUS	SR6 WALL SUPPLY
						N SCHEDULE	FA							AD1	25	Yes	ALUMINUM		8 x 8	350FL	TITUS	ER1 WALL
	DATA	MOTOR D	_			PERFORMANC			F DESIGN	BASIS O	T DATA	UN										EXTINOUT
(LBS) SCHEDULE NOTES	LTS PHASE	BHP VOL	E E HP	ESP DRIVE N WG) TYPE	FLOW (CFM)	ΡE	FAN TYF	L	ER MODE	MANUFACTURE	FUNCTION	LOCATION	Mark	AD1	25	No	ALUMINUM		14 x 10	350FL	TITUS	RG6 WALL RETURN
49 F.01	20 1	0.07 120	CT 0.17	0.40 DIREC	225	R VENTILATOR	LAST POWER	B DOWN	G-098	GREENHECK	TOILET EXHAUST	ROOF	EF-1	AD1	25	Yes	ALUMINUM	12	24 x 24	TBDI-80	TITUS	PS5 CEILING

	ROOFTOP UNIT SCHEDULE (CHILLED WATER / HOT WATER) (PART 1 OF 2)									EXPANSION TANK SCHEDULE																					
UNIT	DATA	BASIS OF	DESIGN				SUPPLY	FAN DAT	Ά							CHIL	LED WAT	ER COO	LING DA	TA					UNIT DATA	BASIS OF DES	SIGN	PERFORM	IANCE DATA		
TAG	LOCATION	MANUFACTU RER	MODEL	TOTAL AIRFLOW (CFM)	MIN OA (CFM)	ESP (IN WG)	FAN TYPE	# OF FANS	HP (EACH)	BHP (EACH)	VOLTS	PHASE	FREQUENCY (HZ)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT DB (°F)	EAT LA WB DI (°F) (°F	T LA ⁻ B WE F) (°F	T B EWT) (°F)	LWT (°F)	FLUID TYPE	FLOW (GPM)	ROWS	TAG	FUNCTION	MANUFACTURER	MODEL	MIN TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	SYSTEM VOLUME (GAL)	SCHEDULE NOTES
										,												. ,									
RTU-1	ROOF	TRANE	CSAA	7,670	1,040	2.00	DIRECT DRIVE PLENUM	1	10.00	8.20	208	3	60	181.9	173.2	77.1	62.9 54	.9 54.	9 45	55	WATER	39.7	6	ET-1	HEATING HOT WATER	BELL & GOSSETT	HFT-60V	27.47	5.8	210	
RTU-1	ROOF	IRANE	CSAA	7,670	1,040	2.00	DIRECT DRIVE PLENUM	1	10.00	8.20	208	3	60	181.9	173.2	77.1	62.9 54	.9 54.	9 45	55	WAIER	39.7	6	EI-1	HEATING HOT WATER	BELL & GOSSETT	HF1-60V	27.47	5.8	210	

			ROOFTOP UNIT SCH	IEDULE (CHILLED	WATER / HO	T WATER) (PART	2 OF 2)												HEAT E	EXCHANGER	SCHEDULE (STEAM TO W	VATER)							
	HOT WATER	R PREHEAT COIL I	EATING DATA	FILTER DAT	A	ELECTRICAL	DATA						UNIT DATA B		BASIS OF D	ESIGN		PERFOR	MANCE DATA	۱			STEAM SIDE			HEATIN	G HOT WATER	SIDE		
	HEATING EAT AIRFLOW DB	LAT OUTPUT DB CAPACIT	Y EWT LWT FL				FREQUENC	Y WEIGHT	00115								MODEL	TV	CA				INLE PPRESS	T STEAN	FLOW	PD FLUI			VT WPD	
TAG			(°F) (°F) (GI			VOLIS PHAS	= (HZ)	(LBS)	SCHE	EDULE NOTE		TAG	LOCATION		UNCTION	MANUFACIURER	MODEL		2E ((імвн)	(50 FT)	ITPE	(131	э) (Г)		PSIG) 11P			r) (PSIG)	SCHEDULE NOTE:
RTU-1	7,670 62.8	85.0 170.8	180 150 11	.37 8	52.5	208 3	60	4,121	AH.01, AH	H.02, AH.03, A	H.04	HX-1	MECH ROOM	M HEATIN	NG HOT WATER	BELL & GOSSETT	SU-63-4	SHELL AN	ID TUBE	488.1	13.1	STEAM	1 7.00) 231.6	506.9	4.34 WATE	ER 33.3	3 150.0 180	0.0 6.50	
				AIR SEP	ARATOR SO	HEDULE													I	PUMP SCHEI	DULE									
				MAX		ACITY DESIG	N WPD	CONNECTIO					ι	UNIT DATA		BA	SIS OF DESIG	iN		PERFO	RMANCE DAT	A			MOTOR D	ΑΤΑ				
IAG	FUNCTION	IYPE	MANUFACIURE	R MODEL	(GPIVI)	FLOR (G	PM) (FIHD)	(IN)	V	WIEGHI	SCHEDULE NOTES									FLUID	FLOW	EXT WPD	EFF	_			_	WEIGHT		
AS-1	HEATING HOT WATER	R CENTRIFUGA	Bell & Gossett	RL-3F	190	33	0.06	3		173		TAG	LOCA	TION	FUNCTION	MANUFAC	CTURER	MODEL	PUMP TYPE	Ε ΤΥΡΕ	(GPM)	(FT HD)	(%) H	IP BHP R	PM VOLT	S PHASE	ECM	(LBS)	SCHEDULE NC	TES
-						·						P-1	GROUND	FL MECH	HEATING HOT WAT	ER Bell & G	Gossett	ECOCIRC	IN-LINE	WATER	33.0	9	51.5 0.	17 0.14 2	190 120	1	Yes	22		
												P-2	RO	OF	PREHEAT COIL	Bell & G	Gossett	ECOCIRC	IN-LINE	WATER	11.4	7	47.6 0.	17 0.04 2	046 120	1	Yes	16		

HYDRONIC COILS: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS SPACED NO CLOSER THAN 0.1 INCH (2.5 MM), RATED FOR A MINIMUM

COIL SECTION INSULATION: 1/2-INCH- THICK, GLASS FIBER COMPLYING WITH ASTM C1071 AND ATTACHED WITH ADHESIVE COMPLYING WITH ASTM C916.

TWO-PIECE BALL VALVES: BRONZE BODY WITH FULL-PORT, CHROME-PLATED BRONZE BALL; PTFE OR TFE SEATS; AND 600-PSIG (4140-KPA) MINIMUM CWP

MOTORS: COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS.

FRAME: MODULAR AND PROVIDING OVERALL STRUCTURAL INTEGRITY WITHOUT RELIANCE ON CASING PANELS FOR STRUCTURAL SUPPORT.

FACTORY, HYDRONIC PIPING PACKAGE: ASTM B88, TYPE L COPPER TUBE WITH WROUGHT-COPPER FITTINGS AND BRAZED JOINTS. LABEL PIPING TO INDICATE

DOUBLE-WALL CONSTRUCTION: INSIDE CASING WALL GALVANIZED STEEL. CASING INSULATION THICKNESS: 2 INCHES. PROVIDE CONTINUITY OF INSULATION

FABRICATE WINDOWS IN ACCESS PANELS AND DOORS OF DOUBLE-GLAZED, SAFETY GLASS WITH AN AIRSPACE BETWEEN PANES AND SEALED WITH INTERIOR

PANELS, DOORS, AND WINDOWS: FORMED AND REINFORCED, DOUBLE-WALL AND INSULATED PANELS OF SAME MATERIALS AND THICKNESSES AS CASING.

CONDENSATE DRAIN PANS: DOUBLE-WALL, STAINLESS-STEEL SHEET WITH SPACE BETWEEN WALLS FILLED WITH FOAM INSULATION AND MOISTURE-TIGHT

HOUSINGS: FORMED- AND REINFORCED-STEEL PANELS TO FORM CURVED SCROLL HOUSINGS WITH SHAPED CUTOFF AND SPUN-METAL INLET BELL.

MOTORS: COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS.

BRACING: STEEL ANGLE OR CHANNEL SUPPORTS FOR MOUNTING AND SUPPORTING FAN SCROLL, WHEEL, MOTOR, AND ACCESSORIES.

FAN AND DRIVE ASSEMBLIES: STATICALLY AND DYNAMICALLY BALANCED AND DESIGNED FOR CONTINUOUS OPERATION AT MAXIMUM-RATED FAN SPEED AND

HOUSINGS, PLENUM FANS: STEEL FRAME AND PANEL; FABRICATED WITHOUT FAN SCROLL AND VOLUTE HOUSING. PROVIDE INLET SCREENS FOR TYPE SWSI

CONTROLLERS, ELECTRICAL DEVICES, AND WIRING: COMPLY WITH REQUIREMENTS FOR ELECTRICAL DEVICES AND CONNECTIONS SPECIFIED IN ELECTRICAL

VARIABLE-FREQUENCY MOTOR CONTROLLER: CONTROL SIGNAL INTERFACE: ELECTRIC. PROPORTIONAL INTEGRAL DIRECTIVE (PID) CONTROL INTERFACE.

GENERAL REQUIREMENTS FOR COIL SECTION: COMPLY WITH AHRI 410. FABRICATE COIL SECTION TO ALLOW REMOVAL AND REPLACEMENT OF COIL FOR

900. INTERLACED GLASS, SYNTHETIC OR COTTON FIBERS COATED WITH NONFLAMMABLE ADHESIVE. FILTER-MEDIA FRAME BEVERAGE BOARD WITH

MAINTENANCE AND TO ALLOW IN-PLACE ACCESS FOR SERVICE AND MAINTENANCE OF COIL(S). COILS SHALL NOT ACT AS STRUCTURAL COMPONENT OF UNIT.

PANEL FILTERS DESCRIPTION: PLEATED FACTORY-FABRICATED. SELF-SUPPORTED. DISPOSABLE AIR FILTERS WITH HOLDING FRAMES. FILTER UNIT CLASS UL

AIRSTREAM SURFACES: SURFACES IN CONTACT WITH THE AIRSTREAM SHALL COMPLY WITH REQUIREMENTS IN ASHRAE 62.1.

MAIN AND AUXILIARY DRAIN PANS: STAINLESS STEEL. FABRICATE PANS AND DRAIN CONNECTIONS TO COMPLY WITH ASHRAE 62.1.

WORKING PRESSURE OF 200 PSIG (1378 KPA) AND A MAXIMUM ENTERING-WATER TEMPERATURE OF 220 DEG F (104 DEG C). INCLUDE MANUAL AIR VENT AND

SURFACE-BURNING CHARACTERISTICS: INSULATION AND ADHESIVE SHALL HAVE A COMBINED MAXIMUM FLAME-SPREAD INDEX OF 25 AND SMOKE-DEVELOPED

				ROOFTOP UN	IT SCHEDU	LE (CHILLED W	ATER / HO	T WATER) (P/	ART 2 OF 2)													HEAT E	XCHANGER	SCHEDULE (STEAM TO W	/ATER)								
	Н	OT WATER PR	EHEAT COIL I	EATING DATA	\	FILTER DATA		ELECTRIC	AL DATA							UNIT	DATA		BASIS OF DES	SIGN		PERFORM	IANCE DATA	L			STEAM SI	DE			HEATING	HOT WATER	SIDE	
	HEATING	EAT LA							FDF													C 41				INLE								
TAG	(CFM)	(°F) (°F	(MBH)	(°F) (°F)	(GPM)	FILTER (MERV)) MCA	VOLTS PI	IASE	(HZ)	(LBS)	SCHEDULE I	NOTES		TAG	LOCATION	F	FUNCTION	MANUFACTURER	MODEL	TYPE		MBH)	(SQ FT)		(PSIG	0RE IE 6) (°	MP F F) (L	B/HR) (PSIC	6) TYPE	(GPM)	(°F) (°F	i (PSIG)	SCHEDULE NOTES
RTU-1	7,670	62.8 85.	0 170.8	180 150	11.37	8	52.5	208	3	60	4,121	AH.01, AH.02, AH	1.03, AH.04		HX-1	MECH ROOM	1 HEATIN	NG HOT WATER	BELL & GOSSETT	SU-63-4	SHELL AND	TUBE 4	488.1	13.1	STEAM	7.00	23	1.6 5	06.9 4.34	WATER	33.3	150.0 180	.0 6.50	
						AIR SEPAR	RATOR SC	HEDULE														P	PUMP SCHED	ULE										
						MAX F	LOW CAP		SIGN	NPD CO	ONNECTION S					U	NIT DATA		BAS	IS OF DESIGN			PERFOR	MANCE DAT	4			Ν	IOTOR DATA					
TAG	FUNC		TYPE	MANUFAC			(GPM)	FLO	R (GPM) (F	I HD)	(IN)	WIEGHT	SCHEDU	JLE NOTES	ТАС			FUNCTION	ΜΑΝΙΙΕΛΟΤ					FLOW (GPM)	EXT WPD	EFF (%) H		DDM		DHVSE	ECM	WEIGHT		TES
AS-1	HEATING H	OT WATER	CENTRIFUGA	L Bell & G	ossett	RL-3F	190		33	0.06	3	173				LUCA		TONCTION					1116		(1110)	(70) 11			VOLIS	THAGE		(LDO)	SCHEDULE IN	
															P-1	GROUND F	FL MECH	HEATING HOT WATE	ER Bell & Gos	ssett EC	COCIRC	IN-LINE	WATER	33.0	9	51.5 0.1	17 0.14	2190	120	1	Yes	22		
															P-2	ROC)F	PREHEAT COIL	Bell & Gos	ssett EC	COCIRC	IN-LINE	WATER	11.4	7	47.6 0.1	17 0.04	2046	120	1	Yes	16		

4

MECHANICAL SPECIFICATIONS	
PROVIDE MANUFACTURER'S CATALOG DATA ROOFTOP AIR HANDLING UNITS TERMINAL UNITS	AND SHOP DRAWINGS FOR THE FOLLOWING,
UNIT HEATERS	
PUMP	
HEAT EXCHANGERS	
AIR SEPERATORS EXPANSION TANKS	
DDC CONTROLS	
TAB REPORT	
1. COORDINATION OF WORK: COORDINATE MECHANICAL WORK WITH OTH BUT NECESSARY FOR PROPER INSTALLATIC MECHANICAL, PLUMBING, AND ELECTRICAL CONNECTIONS. MAKE REQUIRED CHANGES	IER TRADES INVOLVED IN THE CONSTRUCTION PROJECT. PROVIDE DROPS, RISES, OR OFFSETS NOT INDICATED N OF WORK. CAREFULLY LAY OUT ALL WORK IN ADVANCE TO COORDINATE WITH ARCHITECTURAL, STRUCTURA EATURES OF CONSTRUCTION. VERIFY AT SITE ALL LOCATIONS, GRADES, ELEVATIONS, AND UTILITY SERVICE OR RELOCATIONS NECESSARY TO RESOLVE ANY CONFLICTS.
2. TESTING AND BALANCING: TAB CONTRACTOR SHALL BE AN INDEPENDE BALANCING DISCIPLINES REQUIRED FOR TH EXPERIENCE ON PROJECTS OF SIMILAR SIZI ADJUSTING, AND BALANCING THE BUILDING FOR CONFORMITY TO DESIGN, MEASUREME DESIGN SPECIFICATION, AND RECORDING A	INT TESTING, ADJUSTING, AND BALANCING AGENCY CERTIFIED BY AABC AND/OR NEBB IN THE TESTING AND IS PROJECT. AGENCY SHALL HAVE AT LEAST 3 YEARS OF SUCCESSFUL TESTING, ADJUSTING, AND BALANCING E AND COMPLEXITY AS THIS PROJECT. AGENCY SHALL BE THE SINGLE SOURCE OF RESPONSIBILITY FOR TESTING MECHANICAL SYSTEMS TO MEET THE DESIGN OBJECTIVES. SERVICES SHALL INCLUDE CHECKING INSTALLATION NT AND ESTABLISHMENT OF THE FLOW QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED TO MEET ND REPORTING THE RESULTS.
3. IDENTIFICATION AND LABELS: PROVIDE AND INSTALL LABELS ON EQUIPME	NT. LABELS SHALL BE BLACK WITH WHITE LETTERING. LABELS SHALL BE CLEARLY READABLE FROM A DISTANC
リトゥトエ. PROVIDE AND INSTALL LABELS INDICATING 1	OCATION AND MARK OF EQUIPMENT LOCATED ABOVE CEILING REQUIRING ROUTINE MAINTENANCE. LABEL
3HALL BE WHITE WITH BLACK LETTERING AN PROVIDE PRE-PRINTED, SELF-ADHESIVE PIP PROVIDE PLASTIC-LAMINATED, SELF-ADHES CLEARLY READABLE EROM A DISTANCE OF	ID SHALL BE CLEARLY READABLE FROM A DISTANCE OF 5 FT. E LABELS WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION ACCORDING TO ASME A13.1. IVE LABELS. GREEN LABEL WITH WHITE LETTERING FOR SUPPLY, RETURN, AND EXHAUST AIR. LABELS SHALL BI SET
SELAKET READABLET ROM A DISTANCE OF S	
I. BUILDING TEMPERATURE CONTROLS: NTEGRATE TO EXISTING CONTROL SYSTEM PROVIDE WHITE COLOR THERMOSTATS AND	WITH ASHRAE 135 COMMUNICATION PROTOCOL. HUMIDISTATS WITH DIGITAL DISPLAY. MOUNT 48" AFF.
5. HYDRONIC STEEL PIPE AND FITTINGS: STEEL PIPE: ASTM A53/A53M BLACK STEEL V	/ITH PLAIN ENDS; WELDED AND SEAMLESS, GRADE B, SCHEDULE 40, GRADE B STEEL PIPE.
CAST-IRON THREADED FITTINGS: ASME B16. JOINT FITTINGS: ASTM A536, GRADE 65-45-12 FABRICATED STEEL; OR ASTM A106/A106M, (COUPLINGS; WITH NUTS, BOLTS, LOCKING F COUPLINGS: DUCTILE- OR MALLEABLE-IRON LOCKING PIN, LOCKING TOGGLE, OR LUGS T	4; CLASSES 125. 2 DUCTILE IRON; ASTM A47/A47M, GRADE 32510 MALLEABLE IRON; ASTM A53/A53M, TYPE F, E, OR S, GRADE B 3 RADE B STEEL FITTINGS WITH GROOVES OR SHOULDERS CONSTRUCTED TO ACCEPT GROOVED-END IN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS. HOUSING AND EPDM GASKET OF CENTRAL CAVITY PRESSURE-RESPONSIVE DESIGN; WITH NUTS, BOLTS, O SECURE GROOVED PIPE AND FITTINGS.
PLAIN-END MECHANICAL-JOINT COUPLINGS: . SOURCE LIMITATIONS: OBTAIN PLAIN-END 2. HOUSING: ASTM A536, GRADE 65-45-12 SE 3. HOUSING COATING: NONE.	MECHANICAL-JOINT COUPLINGS FROM SINGLE MANUFACTURER. GMENTED DUCTILE IRON OR TYPE 304 STAINLESS STEEL.
5. SEALING MECHANISM: DOUBLE-LIP SEALIN 5. BOLTS, HEX NUTS, WASHERS, OR LOCK B	IG SYSTEM OR CARBON STEEL CASE-HARDENED JAWS. ARS BASED ON MANUFACTURER'S DESIGN.
3. STEEL PIPE NIPPLES: ASTM A733, MADE O NSULATION, ONE OF THE FOLLOWING:	FAT OF THE JOINED PIPES. SAME MATERIALS AND WALL THICKNESSES AS PIPE IN WHICH THEY ARE INSTALLED.
1. CELLULAR GLASS: 2 INCHES (50 MM) THIC 2. ELEXIBLE ELASTOMERIC: 2 INCHES (50 MM	
3. GLASS-FIBER, PREFORMED PIPE INSULAT 4. MINERAL WOOL, PREFORMED PIPE INSUL	ON, TYPE I: 2 INCHES (50 MM) THICK. ATION, TYPE II: 2 INCHES (50 MM) THICK.
6. DUCTS: ALL DUCTWORK SHALL BE GALVANIZED STE	EL. DUCT SHALL BE FABRICATED IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
III WITH FACTORY-APPLIED FSK JACKET. INS LESS. THICKNESS OF INSULATION SHALL EN SUPPLY AIR DUCTS WITH A FACTORY APPLI AND EQUIPMENT BLUE COATING PROCESSE FSK JACKET: ALUMINUM-FOIL, FIBERGLASS-	ULATION SHALL HAVE A FLAME-SPREAD INDEX OF 25 OR LESS AND A SMOKE-DEVELOPED RESISTANCE OF 50 OR SURE AN R-VALUE GREATER THAN OR EQUAL TO R-6. COAT INTERIOR SURFACES OF THE FIRST 20 FEET OF 2D ANTIMICROBIAL COATING FOSTER 40-20, AGION ANTIMICROBIAL COMPOUND TREATMENT FOR METAL DUCT D BY LINDAB INCM, AVRON46 BY SEMCO, OR EQUAL APPOVED BY VT. REINFORCED SCRIM WITH WHITE KRAFT-PAPER BACKING; COMPLYING WITH ASTM C 1136, TYPE II.
PROVIDE DOUBLE-WALL DUCTWORK FOR DI SYSTEM WITH FACTORY FABRICATED DUCT 1. OUTER DUCT: OUTER DUCT SHALL BE AL	JCTS LOCATED OUTDOORS PAINTED WITH WEATHER RESISTANT PAINT. PROVIDE A FLANGED PREFABRICATED SECTIONS AND FITTINGS. THERMAL BRIDGES ARE NOT ALLOWED. JMINUM, ASTM B209, ALLOY 3003-H14.
3. INTERSTITIAL INSULATION: MINIMUM R-6 OUTER DUCT WITHOUT COMPRESSING INSU	FIBERGLASS INSULATION. INSTALL SPACERS THAT POSITION THE INNER DUCT AT UNIFORM DISTANCE FROM LATION.
PRESSURE RATINGS AND SEAL CLASS FOR 1 1. OUTSIDE AIR: 6 INCHES WG 2. SUPPLY UPSTREAM OF TU'S: 6 INCHES W	JUCTWORK: G
 SUPPLY DOWNSTREAM OF TU'S: 1 INCH V RETURN: -2 INCHES WG EXHAUST: -2 INCH WG TRANSFER DUCT: -0.5 INCH 	/G
7. LINEAR SLOT DIFFUSERS MATERIAL: ALUMINUM. FINISH: BAKED ENAMEL, WHITE. MOUNTING: LINEAR SLOT LAY IN T-BAR.	

DAMPERS: DEFLECTOR BLADES.

2

8.	LAY IN DIFFUSERS	

MATERIAL: ALUMINUM. FINISH: BAKED ENAMEL, WHITE.

MOUNTING: LAY IN. PATTERN: FOUR-WAY FIXED DISCHARGE WITH REMOVABLE CORE. DAMPERS: RADIAL OPPOSED BLADE.

9. GRILLES: MATERIAL: ALUMINUM. FINISH: BAKED ENAMEL, WHITE.

10. TERMINAL UNITS

FILTERS: NONE

HOUSING: ALUMINUM

WHEEL: ALUMINUM

DRAIN.

FACE BLADE ARRANGEMENT: FIXED EGGCRATE GRID SPACED 1/2 INCH APART. MOUNTING: LAY IN.

INDEX OF 50 WHEN TESTED ACCORDING TO ASTM E84 BY A QUALIFIED TESTING AGENCY.

CHASSIS: GALVANIZED STEEL. FLOOR-MOUNTING UNITS SHALL HAVE LEVELING SCREWS.

CASING JOINTS: HERMETICALLY SEALED AT EACH CORNER AND AROUND ENTIRE PERIMETER.

WITH NO THROUGH-CASING METAL IN CASING WALLS, FLOORS, OR ROOFS OF AIR-HANDLING UNIT.

SHAFTS: WITH FIELD-ADJUSTABLE ALIGNMENT. TURNED, GROUND, AND POLISHED HOT-ROLLED STEEL WITH KEYWAY.

DAMPER TYPE: NONE. ACCESSORY: MERV 8 DISPOSABLE FILTER.

RATING AND BLOWOUT-PROOF STEM.

11. CENTRIFUGAL ROOF EXHAUST FAN:

12. ROOFTOP AIR HANDLING UNIT

AND EXTERIOR RUBBER SEALS.

MOTOR HORSEPOWER.

FAN TYPE: CENTRIFUGAL BACKWARD INCLINDED

ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED

BASE RAIL: GALVANIZED STEEL HEIGHT 6 INCHES.

DRIVE, DIRECT: FACTORY-MOUNTED, DIRECT DRIVE.

ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED.

DRIVE: DIRECT DRIVEN MOTOR MOUNTED ON VIBRATION ISOLATION

EFFICIENCY: PREMIUM EFFICIENT MOTORS AS DEFINED IN NEMA MG 1.

FANS: CENTRIFUGAL, GALVANIZED STEEL; MOUNTED ON SOLID-STEEL SHAFT.

EFFICIENCY: PREMIUM EFFICIENT MOTORS AS DEFINED IN NEMA MG 1.

PERFORATED METAL RETAINER, OR METAL GRID, ON OUTLET SIDE.

DDC SYSTEM FOR HVAC PROTOCOLS FOR NETWORK COMMUNICATIONS: ASHRAE 135.

HYDRONIC COILS: TUBE MATERIAL COPPER. FIN TYPE PLATE. FIN MATERIAL ALUMINUM.

SERVICE, INLET, AND OUTLET.

CATED CTURAL, /ICE

CING ESTING, LATIONS

STANCE A13.1. HALL BE

SEAL.

FANS

SECTIONS.

TWO-PIECE BALL VALVES: BRONZE BODY WITH FULL-PORT. CHROME-PLATED BRONZE BALL: PTFE OR TFE SEATS: AND 600-PSIG (4140-KPA) MINIMUM CWP RATING AND BLOWOUT-PROOF STEM. OUTDOOR-AIR DAMPER: LOW-LEAKAGE, DOUBLE-SKIN, AIRFOIL-BLADE, GALVANIZED-STEEL DAMPERS WITH COMPRESSIBLE JAMB SEALS AND EXTRUDED-VINYL BLADE EDGE SEALS IN PARALLEL-BLADE ARRANGEMENT WITH ZINC-PLATED STEEL OPERATING RODS ROTATING IN STAINLESS STEEL SLEEVE BEARINGS MOUNTED IN A SINGLE GALVANIZED-STEEL FRAME, AND WITH OPERATING RODS CONNECTED WITH A COMMON LINKAGE. LEAKAGE RATE SHALL NOT EXCEED 4 CFM/SQ. FT. AT 1-INCH WG AND 8 CFM/SQ. FT. AT 4-INCH WG (LEAKAGE CLASS 1). ELECTRONIC DAMPER OPERATORS: DIRECT-COUPLED TYPE DESIGNED FOR MINIMUM 60,000 FULL-STROKE CYCLES AT RATED TORQUE. ELECTRONIC DAMPER POSITION INDICATOR SHALL HAVE VISUAL SCALE INDICATING PERCENT OF TRAVEL AND 2- TO 10-V DC, FEEDBACK SIGNAL. OPERATOR MOTORS: COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS FOR MOTORS SPECIFIED IN SECTION 230513 "COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT." SIZE TO OPERATE WITH SUFFICIENT RESERVE POWER TO PROVIDE SMOOTH MODULATING ACTION OR TWO-POSITION ACTION. PERMANENT SPLIT-CAPACITOR OR SHADED-POLE TYPE: GEAR TRAINS COMPLETELY OIL IMMERSED AND SEALED. EQUIP SPRING-RETURN MOTORS WITH INTEGRAL SPIRAL-SPRING MECHANISM IN HOUSINGS DESIGNED FOR EASY REMOVAL FOR SERVICE OR ADJUSTMENT OF LIMIT SWITCHES, AUXILIARY SWITCHES, OR FEEDBACK POTENTIOMETER. SPRING-RETURN MOTORS FOR DAMPERS LARGER THAN 25 SQ. FT.: SIZE FOR RUNNING AND BREAKAWAY TORQUE OF 150 IN. X LBF. ELECTRONIC OVERLOAD OR DIGITAL ROTATION-SENSING

CIRCUITRY.MECHANICAL, SPRING-RETURN MECHANISM WITH EXTERNAL, MANUAL GEAR RELEASE ON NONSPRING-RETURN ACTUATORS.

PROVIDE WARRANTY FOR WATERTIGHT ROOF PENETRATIONS.

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TECI

JRE DROP DOES NOT INCLUDE COOLING COIL, HEATING COIL, FILTER, MIXING SHALL BE BASED ON 45 °F E.W.T. WATER. PRESURE DROP SHALL NOT

SCHEDULE NOTES THIS SHEET

NOT EXCEED 500 FPM. ES SHALL BE BASED ON 180°F E.W.T WATER. PRESSURE DROP SHALL NOT

PEED ELECTRICALLY COMMUTATED MOTOR FOR BALANCING.

ES SHALL BE BASED ON 55°F E.A.T. AND 180°F E.W.T. WITH A 20°F

ER PRESSURE DROP SHALL NOT EXCEED 12 FT WG. SSURE DROP AT THE INDCATED MAX CFM SHALL NOT EXCEED 0.5 IN. WG.

RIZONTAL DISCHARGE TYPE.

13. ELECTRICAL RESISTANCE UNIT HEATERS

DELECTRIC-RESISTANCE HEATING COILS: NICKEL-CHROMIUM HEATING WIRE OR TUBULAR ELEMENTS IN COIL FINS, FREE OF EXPANSION NOISE AND HUM, WITH FUSES IN TERMINAL BOX FOR OVERCURRENT PROTECTION AND CONTINUOUS LIMIT CONTROLS FOR HIGH-TEMPERATURE PROTECTION. TERMINATE ELEMENTS IN STAINLESS-STEEL MACHINE-STAKED TERMINALS SECURED WITH STAINLESS-STEEL HARDWARE. FAN: FORWARD CURVED, DOUBLE WIDTH, CENTRIFUGAL; DIRECTLY CONNECTED TO MOTOR. THERMOPLASTIC OR PAINTED-STEEL WHEELS, AND

ALUMINUM, PAINTED-STEEL, OR GALVANIZED-STEEL FAN SCROLLS. FAN SHAFT AND BEARINGS: HOLLOW-STEEL SHAFT WITH PERMANENTLY LUBRICATED, RESILIENTLY MOUNTED BEARINGS.

DRIVE, DIRECT: FACTORY-MOUNTED, DIRECT DRIVE. MOTORS: COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS. ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED. EFFICIENCY: PREMIUM EFFICIENT MOTORS AS DEFINED IN NEMA MG 1.

14. STEAM TO HOT WATER HEAT EXCHANGER

CONFIGURATION: U-TUBE

CONSTRUCTION: FACTORY-FABRICATED WITH CAST-IRON FLANGED HEAD BOLTED TO STEEL SHELL; SEAMLESS COPPER TUBES OF DIAMETER DETERMINED BY MANUFACTURER TO MEET SERVICE REQUIREMENTS; STEEL TUBE-SHEETS AND BAFFLES; AND PIPING

CONNECTIONS. FABRICATE AND LABEL HEAT EXCHANGERS TO COMPLY WITH ASME BOILER AND PRESSURE VESSEL CODE, SECTION VIII, "PRESSURE VESSELS," DIVISION 1.

A. PIPING CONNECTIONS 2 INCHES NPS AND SMALLER SHALL HAVE THREADED ENDS. B. PIPING CONNECTIONS 2-1/2 INCHES AND LARGER SHALL HAVE FLANGED ENDS.

TUBE SIDE 150 PSIG DESIGN PRESSURE AT 375 DEG. F SHELL SIDE 150 PSIG DESIGN PRESSURE AT 375 DEG. F

15. IN-LINE PUMPS DESCRIPTION: FACTORY-ASSEMBLED AND -TESTED, CENTRIFUGAL, OVERHUNG-IMPELLER, CLOSE-COUPLED, IN-LINE PUMP; DESIGNED FOR INSTALLATION WITH PUMP AND MOTOR SHAFTS MOUNTED HORIZONTALLY.

PUMP CONSTRUCTION: CASING: RADIALLY SPLIT, CAST IRON, WITH THREADED GAUGE TAPPINGS AT INLET AND OUTLET AND THREADED COMPANION-FLANGE

CONNECTIONS. IMPELLER: ASTM B584, CAST BRONZE; STATICALLY AND DYNAMICALLY BALANCED, KEYED TO SHAFT, AND SECURED WITH A LOCKING CAP SCREW. FOR CONSTANT-SPEED PUMPS, TRIM IMPELLER TO MATCH SPECIFIED PERFORMANCE. PUMP SHAFT SLEEVE: TYPE 304 STAINLESS STEEL

PUMP STUB SHAFT: TYPE 304 STAINLESS STEEL. SEAL: MECHANICAL SEAL CONSISTING OF CARBON ROTATING RING AGAINST A CERAMIC SEAT HELD BY A STAINLESS STEEL SPRING, AND EPDM RUBBER BELLOWS AND GASKET. INCLUDE WATER SLINGER ON SHAFT BETWEEN MOTOR AND SEAL. SEAL FLUSHING: FLUSH, COOL, AND LUBRICATE PUMP SEAL BY DIRECTING PUMP DISCHARGE WATER TO FLOW OVER THE SEAL SHAFT COUPLING: RIGID, AXIALLY-SPLIT SPACER COUPLING TO ALLOW SERVICE OF PUMP SEAL WITHOUT DISTURBING PUMP OR MOTOR.

MOTOR: COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, AND EFFICIENCY REQUIREMENTS. ENCLOSURE : TOTALLY ENCLOSED, FAN COOLED. NEMA PREMIUM EFFICIENT MOTORS AS DEFINED IN NEMA MG 1.

PROVIDE INTEGRAL PUMP MOTOR VARIABLE-SPEED ECM CONTROLLER FOR BALANCING.

16. DIAPHRAGM-TYPE NON-ASME EXPANSION TANKS: TANK: CARBON STEEL, NON-ASME CONSTRUCTED, RATED FOR MINIMUM 100 PSIG (690 KPA) WORKING PRESSURE AT MINIMUM 200 DEG F (115 DEG C) MAXIMUM OPERATING TEMPERATURE. DIAPHRAGM: SECURELY SEALED INTO TANK TO SEPARATE AIR CHARGE FROM SYSTEM WATER TO MAINTAIN REQUIRED EXPANSION CAPACITY. AIR-CHARGE FITTINGS: SCHRADER VALVE, STAINLESS STEEL WITH EPDM SEATS.

17. IN-LINE AIR SEPARATORS: TANK: ONE-PIECE CAST IRON WITH AN INTEGRAL WEIR CONSTRUCTED TO DECELERATE SYSTEM FLOW TO MAXIMIZE AIR SEPARATION. MAXIMUM WORKING PRESSURE: UP TO 175 PSIG (1207 KPA). MAXIMUM OPERATING TEMPERATURE: UP TO 300 DEG F (149 DEG C).

18. STEAM SAFETY VALVES BRONZE STEAM SAFETY VALVES: ASME LABELED. DISC MATERIAL: FORGED COPPER ALLOY.

END CONNECTIONS: THREADED INLET AND OUTLET. SPRING: FULLY ENCLOSED STEEL SPRING WITH ADJUSTABLE PRESSURE RANGE AND POSITIVE SHUTOFF; FACTORY SET AND SEALED. PRESSURE CLASS: 250.

DRIP-PAN ELBOW: CAST IRON AND HAVING THREADED INLET AND OUTLET, WITH THREADS COMPLYING WITH ASME B1.20.1. SIZE AND CAPACITY: AS REQUIRED FOR EQUIPMENT ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE.

19. PRESSURE-REDUCING VALVES ASME LABELED.

SIZE, CAPACITY, AND PRESSURE RATING: FACTORY SET FOR INLET AND OUTLET PRESSURES INDICATED DESCRIPTION: PILOT-ACTUATED DIAPHRAGM TYPE, WITH ADJUSTABLE PRESSURE RANGE AND POSITIVE SHUTOFF.

BODY: CAST IRON. END CONNECTIONS: THREADED CONNECTIONS. TRIM: HARDENED STAINLESS STEEL.

HEAD AND SEAT: STAINLESS STEEL, REPLACEABLE, MAIN HEAD STEM GUIDE FITTED WITH FLUSHING AND PRESSURE-ARRESTING DEVICE COVER OVER PILOT DIAPHRAGM. GASKETS: NON-ASBESTOS MATERIALS.

20. FLOAT AND THERMOSTATIC STEAM TRAPS, CAST IRON: BODY AND BOLTED CAP: ASTM A126 CAST IRON.

END CONNECTIONS: THREADED. FLOAT MECHANISM: REPLACEABLE, STAINLESS STEEL. SEAT: HARDENED STAINLESS STEEL

TRAP TYPE: BALANCED PRESSURE. THERMOSTATIC BELLOWS: STAINLESS STEEL OR MONEL.

THERMOSTATIC AIR VENT CAPABLE OF WITHSTANDING 45 DEG F (25 DEG C) OF SUPERHEAT AND RESISTING WATER HAMMER WITHOUT SUSTAINING DAMAGE.

MAXIMUM OPERATING PRESSURE: 125 PSIG (860 KPA). 21. INVERTED BUCKET STEAM TRAPS, CAST IRON:

BODY AND CAP: CAST IRON. END CONNECTIONS: THREADED.

HEAD AND SEAT: STAINLESS STEEL VALVE RETAINER, LEVER, AND GUIDE PIN ASSEMBLY: STAINLESS STEEL. BUCKET: BRASS OR STAINLESS STEEL. PRESSURE RATING: 250 PSIG (1725 KPA).

NOTE:

RTU-1 TO BE PROVIDED BY OWNER, INSTALLED BY CONTRACTOR. ALL NECESSARY CONNECTIONS TO RTU-TO BE PROVIDED BY CONTRACTOR.

VT UNIVERSITY BUILDING OFFICIAL

APPROVAL STAMP

	1	2
	CONTROL SYMBOLS	
	CONTROL POINT INPUT/OUTPUT	AIRFLOW MEASURING DEVICE OR HUMIDIFIER
_	POINT NAME AI	AF
F	DUCT/EQUIPMENT/PIPE MOUNTED CONTROL DEVICE	
	2-WAY CONTROL VALVE	
	FO: FAIL OPEN FC: FAIL CLOSED FL: FAIL IN LAST POSITION	
	3-WAY CONTROL VALVE	HW
	C C: COMMON FO: FAIL OPEN FO: FAIL OPEN	
	FC FAIL CLOSED FC FO FL: FAIL IN LAST POSITION	
Е	AVERAGING / CONTINUOUS SENSING ELEMENT SENSOR OR SWITCH	
		PUMP
	SINGLE POINT SENSOR OR SWITCH	
	Т	
	IMMERSION TEMPERATURE SENSOR	MD: MOCKIZED DAMPER SD: SMOKE DAMPER FD: FIRE DAMPER FD: FIRE DAMPER FSD: COMBINATION FIRE / SMOKE DAMPER
		FO: FAIL OPEN FC: FAIL CLOSED FL: FAIL IN LAST POSITION
	DIFFERENTIAL PRESSURE SENSOR OR SWITCH	
		MD. MOL MOLADPER SD: SMOKE DAMPER FD: FIRE DAMPER FD: COMBINATION FIRE / SMOKE DAMPER
D		FO: FAIL OPEN FC: FAIL CLOSED FL: FAIL IN LAST POSITION
	LO: LOW	MOTOR STARTER, ELECTRONICALLY COMMUTATED MOTOR, VARIABLE FREQUENCY DRIVE, CONTROL PANEL
	AI: ANALOG INPUT	VED
	AF: AIRFLOW MEASURING DEVICE AS: AIRFLOW SWITCH CO2: CARBON DIOXIDE SENSOR	
	CS: CURRENT SENSOR CSW: CURRENT SWITCH DI: DIGITAL INPUT	
	DL: DATA LINK DO: DIGITAL OUTPUT DSD: DUCT SMOKE DETECTOR EA: ELECTRIC ACTUATOR	OUTDOOR
	ECM: ELECTRONICALLY COMMUTATED MOTOR ES: END SWITCH FM: FLOW METER ES: FLOW SWITCH	
	FZ: FREEZESTAT H: HUMIDITY SENSOR LS: LEVEL SENSOR	
С	MS: MOTOR STARTER OS: OCCUPANCY SENSOR PS: PRESSURE SENSOR	
	PSW: PRESSURE SWITCH S: SWITCH T: TEMPERATURE SENSOR TH: TEMPERATURE AND HUMIDITY SENSOR	
	TS: TEMPERATURE SWITCH VFD: VARIABLE FREQUENCY DRIVE VS: VIBRATION SENSOR VSW: VIBRATION SWITCH	
В		
A		

GENERAL SEQUENCE OF OPERATION

OPERATION.

3

A. ADJUSTABLE SET POINTS: PROVIDE FUNCTIONALITY TO ADJUST ALL SET POINTS OR SET POINT LIMITS, WHERE SET POINT RESET LOGIC IS UTILIZED, AT THE BUILDING MANAGEMENT SYSTEM (BMS) GRAPHICAL INTERFACE. B. TRENDING: PROVIDE FUNCTIONALITY TO SELECT POINTS FOR TRENDING, ADJUST THEIR FREQUENCY AND GENERATE CUSTOM TREND REPORTS AT THE BMS GRAPHICAL INTERFACE. C. DUCT SMOKE DETECTOR ALARM / EQUIPMENT SHUTDOWN: ON ACTIVATION OF DUCT SMOKE DETECTOR, REPORT THE ALARM DIRECTLY TO THE FIRE ALARM SYSTEM (FAS) AND SHUT

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DOWN ASSOCIATED EQUIPMENT BY THE BMS. D. RUNTIME ROTATION OF LEAD/LAG MECHANICAL EQUIPMENT: ROTATE LEAD/LAG MECHANICAL EQUIPMENT BASED ON ACCUMULATIVE RUNTIME ONCE EVERY 720 HOURS EXCEPT WHERE EQUIPMENT ROTATION IS PROVIDED BY EQUIPMENT MANUFACTURER'S CONTROL PANEL. E. VARIABLE FREQUENCY DRIVE COMMUNICATIONS DATA LINK: PROVIDE, AT MINIMUM, THE FOLLOWING VARIABLE FREQUENCY DRIVE VIRTUAL POINTS BY ITS COMMUNICATIONS DATA

LINK: ACCUMULATIVE RUN TIME, ACCUMULATIVE KILOWATT HOURS, FAULT RESET, OUTPUT VOLTAGE, OUTPUT AMPERAGE AND OUTPUT FREQUENCY. PROVIDE ALL AVAILABLE MAINTENANCE, FAULT OR ALARM STATUS VIRTUAL POINTS. F. SYSTEM SET POINT RESET BASED ON ZONES OR SYSTEMS: AUTOMATICALLY DETECT ZONES AND SYSTEMS THAT EXCESSIVELY DRIVE SET POINT RESET LOGIC AND GENERATE AN ALARM. PROVIDE FUNCTIONALITY TO REMOVE ZONES OR SYSTEMS FROM SET POINT RESET LOGIC AT THE BMS GRAPHICAL INTERFACE. G. SET POINT DEVIATION ALARM: ON DEVIATION OF TEMPERATURE, HUMIDITY, AIRFLOW OR OTHER CONTROL VARIABLE FROM SET POINT, GENERATE AN ALARM.

H. COMMAND FAILURE ALARM: ON COMMAND FAILURE, WHERE EQUIPMENT COMMAND DOES NOT MATCH ITS FEEDBACK OR STATUS, GENERATE AN ALARM. I. COMMUNICATIONS FAILURE ALARM: ON FAILURE TO COMMUNICATE WITH A CONTROLLER OR CONTROL DEVICE, GENERATE AN ALARM.

J. ALARM LIMITS AND DELAYS: INCLUDE ALARM HIGH AND LOW LIMITS AND TIMED DELAYS THAT PREVENT NUISANCE ALARMS FROM OCCURRING WITHIN NORMAL ERROR OR RESPONSE TIME. K. POWER FAILURE: ON LOSS OF POWER, RETURN VALVE AND DAMPER ACTUATORS TO THEIR FAIL SAFE POSITIONS. ON RESTORATION OF POWER, AUTOMATICALLY RESUME NORMAL

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TEMPERATURE SET POINTS IN BOTH OCCUPIED AND UNOCCUPIED MODES. PRIOR TO SCHEDULED OCCUPIED PERIOD, OPERATE THE AIR HANDLING UNIT AND ITS ASSOCIATED TERMINAL UNITS IN MORNING WARM-UP MODE. C. ECONOMIZER MODE DECISION: ON A FALL IN OUTDOOR AIR TEMPERATURE BELOW 72°F AND OUTDOOR AIR ENTHALPY 2 BTU/LB BELOW RETURN AIR ENTHALPY, ENABLE TO ECONOMIZER MODE. ON A RISE IN OUTDOOR AIR D. DEHUMIDIFICATION MODE DECISION: ON A RISE RETURN AIR RELATIVE HUMIDITY ABOVE 50% RH, ENABLE DEHUMIDIFICATION MODE. ON A FALL RETURN AIR RELATIVE HUMIDITY BELOW 40% RH, DISABLE DEHUMIDIFICATION MODE. E. SUPPLY STATIC PRESSURE SET POINT RESET: CONTINUOUSLY POLL DAMPER POSITION OF SUPPLY TERMINAL UNITS. ON A FALL IN THE GREATEST TERMINAL UNIT DAMPER POSITION BELOW 90% OPEN, GRADUALLY RESET SUPPLY STATIC PRESSURE SET POINT TOWARDS MINIMUM STATIC PRESSURE SET POINT. ON A RISE IN THE GREATEST TERMINAL UNIT POSITION ABOVE 95% OPEN, GRADUALLY RESET SUPPLY STATIC PRESSURE SET POINT TOWARDS 1. WHEN RETURN AIR RELATIVE HUMIDITY IS BELOW 40%, ENABLE SUPPLY AIR TEMPERATURE SET POINT RESET BASED ON COOLING DEMAND. CONTINUOUSLY POLL COOLING DEMAND OF ASSOCIATED TERMINAL UNITS. ON A FALL IN COOLING DEMAND, GRADUALLY RESET SUPPLY AIR TEMPERATURE SET POINT TOWARD 60°F. ON A RISE IN DEMAND, GRADUALLY RESET SUPPLY AIR TEMPERATURE SET POINT TOWARDS 55°F. WHEN RETURN AIR RELATIVE

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2. IN MORNING WARM-UP MODE, ON A FALL AVERAGE ZONE SPACE TEMPERATURE BELOW ITS OCCUPIED SPACE TEMPERATURE SET POINT, INCREASE SUPPLY AIR TEMPERATURE SET POINT TOWARDS 85°F. ONE A RISE IN AVERAGE

2. IN UNOCCUPIED MODE, CYCLE THE SUPPLY FAN ON AND OFF TO SATISFY ASSOCIATE ZONE TEMPERATURE SET POINTS. ON A FALL IN ANY ASSOCIATED ZONE SPACE TEMPERATURE BELOW ITS UNOCCUPIED SPACE TEMPERATURE HEATING SET POINT OR ON A RISE ABOVE ITS UNOCCUPIED SPACE TEMPERATURE COOLING SET POINT, ENERGIZE THE SUPPLY FAN. ON A RETURN IN ASSOCIATE ZONE SPACE TEMPERATURE WITHIN UNOCCUPIED I. RETURN FAN SPEED CONTROL: ON A FALL IN RELIEF AIR PLENUM STATIC PRESSURE BELOW SET POINT, INCREASE RETURN FAN SPEED. ON A RISE IN STATIC PRESSURE, REVERSE THE SEQUENCE.

POINT. REVERSE THE SEQUENCE. OF A FURTHER FALL IN SUPPLY AIR TEMPERATURE, MODULATE THE HOT WATER PREHEAT COIL CONTROL VALVE OPEN. ON A RISE IN SUPPLY AIR TEMPERATURE ABOVE SET POINT, REVERSE THE SEQUENCE. WHEN THE PREHEAT COIL CONTROL VALVE IS FULLY CLOSED DEENERGIZE THE PREHEAT COIL PUMP, UNLESS OUTDOOR AIR TEMPERATURE IS BELOW 38°F, ENERGIZE THE PREHEAT COIL PUMP TO RUN CONTINUOUSLY. WHEN THE SUPPLY FAN IS DEENERGIZE, CLOSE THE CHILLED WATER COOLING COIL CONTROL VALVE AND HOT WATER REHEAT COIL UNLESS OUTDOOR AIR TEMPERATURE IS BELOW 38°F, ENERGIZE THE HOT WATER PREHEAT COIL CIRCULATION PUMP AND MODULATE THE HOT WATER PREHEAT COIL CONTROL VALVE TO MAINTAIN HOT WATER PREHEAT COIL DISCHARGE AIR TEMPERATURE AT 55°F. 2. IN ECONOMIZER MODE, CLOSE THE CHILLED WATER COOLING COIL CONTROL VALVE. ON A RISE IN SUPPLY AIR TEMPERATURE ABOVE SET POINT, MODULATE THE OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER OPEN AND THE RETURN AIR DAMPER CLOSED. ON A FURTHER RISE IN SUPPLY AIR TEMPERATURE ABOVE SET POINT, MODULATE THE CHILLED WATER CONTROL VALVE OPEN. ON A FALL IN SUPPLY AIR TEMPERATURE, REVERSE THE SEQUENCE. ON A FURTHER FALL IN SUPPLY AIR TEMPERATURE BELOW SET POINT, MODULATE THE HOT WATER PRE-HEAT COIL CONTROL VALVE OPEN. ON A RISE IN SUPPLY AIR TEMPERATURE, REVERSE THE SEQUENCE. 1. IN OCCUPIED MODE, CONTROL THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER TO MAINTAIN OUTSIDE AIRFLOW AT SET POINT UNLESS OVERRIDE BY ECONOMIZER MODE. ON A FALL IN OUTDOOR AIRFLOW BELOW SET

M. FREEZESTAT ALARM: ON FREEZESTAT ACTIVATION, DEENERGIZE THE SUPPLY AND RETURN FAN, CLOSE THE OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER, OPEN THE RETURN AIR DAMPER, CLOSE THE CHILLED WATER N. HIGH / LOW STATIC PRESSURE SWITCH ALARM: ON HIGH OR LOW STATIC PRESSURE SWITCH ACTIVATION, DEENERGIZE THE SUPPLY AND RETURN FAN, CLOSE THE OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER, OPEN THE RETURN AIR DAMPER AND CLOSE THE CHILLED WATER COOLING COIL CONTROL VALVE AND HOT WATER PRE-HEAT COIL CONTROL VALVE UNLESS OUTDOOR AIR TEMPERATURE IS BELOW 38°F, ENERGIZE THE HOT WATER PREHEAT COIL CIRCULATION PUMP AND MODULATE THE HOT WATER PREHEAT COIL CONTROL VALVE TO MAINTAIN HOT WATER PREHEAT COIL DISCHARGE AIR TEMPERATURE AT 55°F AND GENERATE AN ALARM. O. RETURN DUCT SMOKE DETECTOR ALARM: ON RETURN DUCT SMOKE DETECTOR ACTIVATION, DEENERGIZE THE SUPPLY AND RETURN FAN, CLOSE THE SUPPLY AIR SMOKE DAMPER, RETURN AIR SMOKE DAMPER, OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER, OPEN THE RETURN AIR DAMPER AND CLOSE THE CHILLED WATER COOLING COIL CONTROL VALVE AND HOT WATER PRE-HEAT COIL CONTROL VALVE UNLESS OUTDOOR AIR TEMPERATURE IS

TO BE PROVIDED BY CONTRACTOR.

RTU-1 TO BE PROVIDED BY OWNER, INSTALLED BY CONTRACTOR. ALL NECESSARY CONNECTIONS TO RTU-1

NOTE:

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PSW

- DI SA HIGH PRESSURE ALARM

AI SA STATIC PRESSURE

SUPPLY

AIR

PS REFER TO

LOCATION

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Scale: NO SCALE

- AI SPACE TEMPERATURE

CONTINUOUSLY.

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TYPICAL VARIABLE AIR VOLUME EXHAUST FAN (EF-) SEQUENCE OF OPERATION

A. SCHEDULING: OPERATE OCCUPIED OR UNOCCUPIED BASED ON TIME OF DAY SCHEDULING. B. EXHAUST FAN START/STOP CONTROL:

1. IN OCCUPIED MODE, OPEN THE EXHAUST FAN ISOLATION DAMPER AND ENERGIZE THE EXHAUST FAN TO RUN

2. IN UNOCCUPIED MODE, DEENERGIZE THE EXHAUST FAN AND CLOSE THE EXHAUST AIR DAMPER.

EXHAUST FAN 2 Scale: NONE

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