

ROOFTOP UNIT CONTROL MATRIX

CONTROL FEATURE	UNITS	RTU-1	RTU-2	NOTES
		SETPOINT OR V/F	SETPOINT OR V/F	
SETPOINTS				
COOLING - OCCUPIED SETPOINT	'F	76	76	
COOLING - UNOCCUPIED SETPOINT	'F	80	81	
DEAD BAND - MINIMUM HEATING AND COOLING TEMPERATURE SETPOINT DIFFERENCE	'F	5	5	
HEATING - OCCUPIED SETPOINT	'F	70	70	
HEATING - UNOCCUPIED SETPOINT	'F	80	80	
PROGRAMMED CONTROL FEATURES				
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - PROGRAMMABLE THERMOSTAT		Y	Y	B
DEMAND CONTROL VENTILATION - CO2 SENSOR FEEDBACK	PPM	1,000	N	B
EQUIPMENT ACCESSORIES AND CONTROL MODULES				
OUTSIDE AIR DAMPER - MOTOR OPERATED (MODULATING)		Y	Y	(K, L)
INTEGRATED ECONOMIZER - DRY BULB TEMPERATURE ENABLE	'F	85	85	E
ECONOMIZER FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM		Y	Y	F, G
RELIEF - BAROMETRIC DAMPER		Y	Y	
RELIEF - CONSTANT VOLUME POWERED EXHAUST FAN	W.C.	0.1	0.1	H
COOLING COIL (QTY: 1) STAGES (MANUAL/STAGED) / VARIABLE SPEEDS + STAGES (ON/OFF/ WATER)		Y	Y	M
HEATING COIL (NATURAL GAS/HEAT WATERS/ELECTRIC)		Y	Y	M
HEAT PUMP COIL WITH REVERSING VALVE	N	N	N	M
HEAT PUMP AUXILIARY HEATING COIL	N	N	N	M, N
SUPPLY FAN CONTROL METHOD				
ON DURING OCCUPIED HOURS		Y	Y	
OPTIMUM START SEQUENCE		Y	Y	
VARIABLE VOLUME - STAGED FAN CONTROL IN RESPONSE TO ZONE TEMPERATURE	N	N	N	M, Q
SAFETIES, INTERLOCKS, AND ALARMS				
GAS VALVE SAFETY		Y	Y	F
SUPPLY AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	(B, F)
RETURN AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	(B, F)
LOW LIMIT FREEZE/STAT - FREEZE PROTECTION SAFETY SHUTDOWN		Y	Y	F
DIV. 15 CONTRACTOR SHALL PROVIDE CONTROL PANEL(S), WIRING, THERMOSTAT(S), TEMPERATURE SENSOR(S), HUMIDISTAT(S), AND/OR CO2 SENSOR(S) WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED TO FACILITATE THE SCHEDULED CONTROL MODULES AND SEQUENCES OF OPERATION. EACH UNIT SHALL CONTROL BASED ON ITS OWN INTERNAL SAFETIES, TIME DELAYS, AND SEQUENCES UNLESS NOTED OTHERWISE. COORDINATE WITH OWNER FINAL BUILDING AND EQUIPMENT SCHEDULES DURING STARTUP.				
NOTES: E. THE FOLLOWING SENSORS SHALL DETERMINE ECONOMIZER ON POINT. REFERENCE SPECIFICATIONS FOR DEVICE REQUIREMENTS. OUTSIDE AIR TEMPERATURE, DIVISION 15 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. RETURN AIR TEMPERATURE, DIVISION 15 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. OUTSIDE AIR HUMIDITY, DIVISION 15 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. RETURN AIR HUMIDITY, DIVISION 15 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. F. DEVICE SHALL BE FACTORY MOUNTED AND PRE-WIRED FOR OPERATION SUBJECT TO THE ONBOARD CONTROLLER. G. PROVIDE UNIT WITH AN FDD SYSTEM CONSISTING OF PERMANENTLY INSTALLED OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR TEMPERATURE SENSORS. THE UNIT CONTROLLER SHALL AT A MINIMUM BE CAPABLE OF PROVIDING SYSTEM STATUS OF ECONOMIZER, COMPRESSOR, HEATING, MIXED AIR LOW LIMIT ALARM, AND SENSOR VALUES. EACH OPERATING MODE SHALL BE CAPABLE OF INDEPENDENTLY OPERATING FOR TESTING. THE SYSTEM SHALL REPORT FAULTS TO AN APPLICATION ACCESSIBLE BY SERVICE PERSONNEL. THE FOLLOWING FAULTS SHALL BE DETECTED: AIR TEMPERATURE SENSOR FAILURE, ECONOMIZER ENABLE/DISABLED WHEN ECONOMIZER SHOULD BE OFF/ON, RESPECTIVELY, DAMPER NOT MODULATING, AND EXCESS OUTSIDE AIR. H. POWERED EXHAUST FAN SHALL STAGE ON AND OFF ACCORDING TO BUILDING STATIC PRESSURE SENSOR. DIVISION 15 SHALL PROVIDE SENSOR. I. EQUIPMENT MANUFACTURER SHALL PROVIDE MODULATING DAMPER AND CONTROLS CAPABLE OF ADJUSTING THE DAMPER POSITION BASED ON FAN SPEED/DIRECTLY MEASURING THE OUTSIDE AIR/CO2/DEMAND CONTROL VENTILATION TO MAINTAIN THE SCHEDULED OUTSIDE AIR AS SHOWN ON THE DRAWINGS. DIV. 15 CONTRACTOR SHALL COORDINATE DAMPER POSITION SETPOINTS IN FIELD DURING TESTING AND BALANCING TO MAINTAIN MINIMUM VENTILATION WHEN NOT IN ECONOMIZER. DAMPER SHALL BE CLOSED DURING UNOCCUPIED HOURS. J. UNITARY CONTROLLER SHALL MODULATE AND/OR CYCLE SUPPLY FAN SPEED SETTING AND COIL CAPACITY STAGES SUBJECT TO THE INTERNAL SAFETIES AND SEQUENCES TO MAINTAIN SCHEDULED SETPOINTS. K. PROVIDE STAGED FAN CONTROL WITH MINIMUM 2 FAN SPEEDS. LOW SPEED SHALL NOT EXCEED 66% OF FULL SPEED AND				

EXISTING ROOFTOP UNIT SCHEDULE (PROVIDED BY LANDLORD)

MARK	MANUFACTURER	MODEL	UNIT TYPE	SUPPLY FAN							COOLING COIL				GAS HEAT		MIN. O/A CFM	DCV O/A CFM	E.E.R./S.E.E.R.	MCA	MOCF	V/PH	DISC. BY	WEIGHT LBS	NOTES		
				FAN TYPE	CFM	MIN HP	ESP (IN)	TSP (IN)	VFD (Y/N)	REFR. TYPE	TH (MBH)	SH (MBH)	EAT	WB	DB	LAT										INPUT (MBH)	OUTPUT (MBH)
RTU-1	LENNOX	LGHD48H4	SINGLE ZONE	FC	1,600	0.75	0.8	1.0	N	R-410A	50.1	37.6	80	67	60	58	65	52	286	143	12.8/17.6	28	40	208/3	DM 26	775	A-Q
RTU-2	LENNOX	LGHD36H4	SINGLE ZONE	FC	1,200	0.50	0.8	1.0	N	R-410A	35.8	27.2	80	67	60	58	65	52	71	36	12.7/18	26	30	208/3	DM 26	750	A-Q

NOTES:
 A. EXISTING RTU TO REMAIN. ROOFTOP UNIT TO BE SERVICED AND CONDITIONED AS REQUIRED.

FAN SCHEDULE

MARK	SERVICE (EA, RA, SA)	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	DRIVE (BELT/DIRECT)	MIN. HP	FAN RPM	VFD (Y/N)	V/PH	DISC. BY	STARTER BY	NOTES
EF-1	EA	COOK	ROOF	802CB	150	0.375	DIRECT	1/8	1528	N	120/1	DM 26	DN 26	A-C

NOTES:
 A. PROVIDE WITH MINIMUM 14" HIGH ROOF CURB, BREEZESCREEN AND BACKDRAFT DAMPER.
 B. ELECTRICAL CONTRACTOR TO FURNISH DISCONNECT SWITCH.
 C. INTERLOCK FAN OPERATION WITH WSP UNIT.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX. NC	MAX. PRESS. DROP (IN. W.C.)	NOTES
CSD1	TITUS	OMNI	PLAQUE	CEILING	24X24	30	0.1	A-H
CSD2	TITUS	OMNI	PLAQUE	CEILING	12X12	30	0.1	A-H
CRG1	TITUS	PAR	PERFORATED	CEILING	24X24	30	0.1	A,D,F,H
CRG2	TITUS	PAR	PERFORATED	CEILING	24X12	30	0.1	A,D,F,H
CEG1	TITUS	PAR	PERFORATED	CEILING	12X12	30	0.1	A,C,D,E,F,H

NOTES:
 A. NECK SIZE SHOWN ON DRAWINGS.
 B. 4-WAY THROW PATTERN UNLESS OTHERWISE SHOWN ON DRAWINGS.
 C. BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
 D. BAKED ENAMEL FINISH, WHITE TO MATCH CEILING COLOR.
 E. PROVIDE NECK FOR DUCT CONNECTION.
 F. FRAME TYPE TO MATCH CEILING CONSTRUCTION. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
 G. PROVIDE BORDER TYPE TO MATCH CEILING CONSTRUCTION WITH CONCEALED MOUNTING, AND INSULATED PLENUM WITH NECK.
 H. STEEL CONSTRUCTION.

PROJECT DESIGN CONDITIONS

SPACE SERVED	SUMMER MAXIMUM TEMPERATURE	SUMMER MAXIMUM RH %	WINTER MINIMUM TEMPERATURE	WINTER MINIMUM RH%
OUTSIDE AIR	95 F	40%	9 F	20%
SALES	76F	50%	69F	NA
OFFICE	76F	50%	69F	NA

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ROOM NAME	AREA, SQ. FT.	OCCUPANTS PER 1000 SQ. FT.	OCCUPANT LOAD	O.A. PER PERSON, CFM	OCCUPANT O.A., CFM	O.A., CFM PER SQ. FT.	AREA O.A., CFM	BASE O.A. REQUIRED (CFM)	SYSTEM EFF., %	TOTAL O.A. REQUIRED (CFM)	SERVED BY
RETAIL	909	15	16	7.5	120	0.12	109	229	80	286	RTU-1
OFFICE	100	5	4	5	20	0.05	6	26	80	33	RTU-2
STORAGE	250	-	-	7.5	-	0.12	30	30	80	38	RTU-2
CORRIDOR	-	-	-	-	-	-	-	-	-	-	
TOTAL - 285										TOTAL - 356	

NOTES:
 1. SET OUTSIDE AIR FOR RTU'S AS SHOWN ON RTU SCHEDULE.
 2. OUTSIDE AIR BASED ON IMC TABLE 403.3.

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Sprint

#1408 DURHAM

2707 GUESS RD, SUITE 110
 DURHAM, NC 27705

MARK	DATE	DESCRIPTION

SHEET TITLE
MECHANICAL SCHEDULES

PROJECT NUMBER
 SPR1408

SHEET AUTHOR
 CHAD GLEASON

CHECKED BY
 DON HERRMAN

DATE
 SEPTEMBER 26, 2017

SHEET:
M-3