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MECHANICAL ELECTRICAL PLUMBING

FIRM NUMBER = C-2130
Jul 31, 2019

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HVAC GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT IN STRICT ACCORDANCE WITH APPLICABLE CODES AND STANDARDS, AND PER MANUFACTURER'S DIRECTIONS.
2. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS, LICENSE, INSPECTIONS, APPROVALS, AND FEES.
3. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES BEFORE INSTALLATION OF ANY MATERIALS OR EQUIPMENT.
4. THESE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATION AND ARRANGEMENT OF ALL MATERIALS AND EQUIPMENT. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER WORK WILL PERMIT.
5. DO NOT SCALE DRAWINGS FOR MEASUREMENTS.
6. ALL DUCT DIMENSIONS SHOWN ARE INTERIOR DUCT DIMENSIONS.
7. ALL PENETRATIONS THROUGH EXTERIOR WALLS & ROOF SHALL BE FLASHED & COUNTERFLASHED IN A WATERPROOF MANNER. (COLOR TO MATCH EXTERIOR).
8. SEAL ALL PENETRATIONS OF RATED WALLS WITH FIRE DAMPER, SEALANT MATERIAL APPROVED BY LOCAL CODE.
9. ALL SUSPENDED MATERIALS AND EQUIPMENT SHALL BE INDIVIDUALLY SUPPORTED FROM THE BUILDING STRUCTURE. DO NOT SUSPEND ITEMS FROM THE CEILING OR ITS SUPPORT SYSTEM.
10. INSTALL ALL CONTROL DEVICES, INCLUDING THERMOSTATS AND SWITCHES, 4'-0" ABOVE FINISHED FLOOR. PROVIDE THE REQUIRED DEVICE(S) FOR ALL SYSTEMS WHETHER LOCATED ON THE PLANS OR NOT.
11. LOCATE CEILING DIFFUSERS IN ACCORDANCE WITH ARCHITECTURAL REFLECTED CEILING PLANS (IF PROVIDED).
12. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND MECHANICAL UNITS FOR MAINTENANCE AND FILTER REMOVAL.
13. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED W/ WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
14. ALL SUPPLY DUCT SHALL BE INSULATED. CONCEALED SHEET METAL DUCT MAY BE EXTERNALLY INSULATED WITH MINERAL FIBER BOARD OR BLANKET OR MAY BE INTERNALLY INSULATED WITH DUCT LINER (R-VALUE = 5). THE FIRST 15' FROM THE AIR HANDLER SHALL BE INTERNALLY LINED. INTERNALLY LINED INSULATION SHALL MEET BACTERIOLOGICAL STANDARD ASTM C 665.
15. CERTIFIED TEST AND BALANCE CONTRACTOR SHALL BALANCE SYSTEM TO AIR QUANTITIES INDICATED ON PLANS AND PROVIDE OWNER'S REPRESENTATIVE WITH COMPLETE BALANCE REPORT. IF BALANCING DAMPERS ARE NOT PROVIDED IN RETURN DUCTWORK, CONTRACTOR SHALL BALANCE SUPPLY SIDE TO AIR QUANTITIES INDICATED ON PLANS AND SHALL BALANCE OUTSIDE AIR AND RETURN AIR FLOWS AT THE AIR HANDLER TO AIR QUANTITIES INDICATED IN THE SCHEDULE. PROVIDE NEW AIR FILTERS FOR EACH UNIT.
16. AS REQUIRED BY LOCAL CODES, MECHANICAL CONTRACTOR SHALL PROVIDE U.L. LISTED FIRE DAMPERS WHERE REQUIRED FOR FIRE PROTECTION REQUIREMENTS OF THE HVAC SYSTEM & THE UL ASSEMBLY.
17. PROVIDE 1 YEAR WARRANTY ON ALL EQUIPMENT AND 5 YEAR WARRANTY ON ALL COMPRESSORS.
18. ALL INTAKE OPENINGS SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ALL EXHAUST LOCATIONS.
19. ALL ACTUACTORS ON MOTORIZED DAMPERS, SMOKE DAMPERS, AND FIRE-SMOKE DAMPERS ARE TO BE LOW VOLTAGE UNLESS OTHERWISE NOTED.
20. REFER TO STRUCTURAL SHEET S0.01 DESIGN CRITERIA, PARAGRAPH 4 FOR SITE SEISMIC CLASSIFICATION. A COMPLETE SYSTEM OF SEISMIC RESTRAINTS SHALL BE DESIGNED BY MASON INDUSTRIES (OR EQUAL) & SEALED BY THEIR REGISTERED ENGR & INSTALLED BY THIS CONTR. AS REQ'D BY APPLICABLE CODES FOR THE LOCALE OF THIS PROJECT. SEISMIC RESTRAINTS FOR SEISMIC CLASSES D, E, AND F SHALL BE SUBMITTED TO THE DESIGN PROFESSIONAL FOR REVIEW PRIOR TO INSTALLATION.
21. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED.
22. ALL MAIN DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS. RUNOUTS FROM MAIN/BRANCH DUCTS MAY BE FLEXIBLE DUCT CONFORMING TO THE REQUIREMENTS OF UL 181 FOR CLASS I FLEXIBLE AIR DUCTS. MAX 10' FLEX PER RUNOUT.
23. THE MECHANICAL CONTRACTOR SHALL PROVIDE REFRIGERANT AND LOW VOLTAGE CONTROL LINES FROM THE CONDENSER TO THE AIR HANDLING UNIT. COORDINATE ROUTING AND INSTALLATION WITH THE GENERAL CONTRACTOR. SIZE REFRIGERANT LINES PER MANUFACTURER'S REQUIREMENTS.
24. ELECTRICAL CONTRACTOR TO PROVIDE ALL HIGH VOLTAGE ELECTRICAL WIRING, CONDUIT, DISCONNECT SWITCHES, FUSES, ECT. TO SPLIT SYSTEM UNITS. ALL FINAL ELECTRICAL CONNECTIONS ARE BY ELECTRICAL CONTRACTOR.
25. OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 1½" FIBERGLASS DUCT WRAP WITH VAPOR BARRIER.
26. REFRIGERANT PIPING, NOT SHOWN ON PLANS, SHALL BE SIZED & INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INSTALLATION INSTRUCTIONS AND LOCAL CODES.
27. MECHANICAL CONTRACTOR SHALL VERIFY LOCATION OF ALL PENETRATIONS FOR RELIEF HOODS, OUTSIDE AIR HOODS, LOUVERS, AND WALL CAPS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
28. MECHANICAL CONTRACTOR SHALL PAINT ALL RELIEF HOODS, INTAKE HOODS, LOUVERS, AND VENT CAPS. CONFIRM COLOR WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
29. SEE PLUMBING SHEETS FOR ALL GAS PIPING INFORMATION AND DETAILS.
30. PENETRATIONS OF RATED WALLS, PARTITIONS AND FLOORS OF NON- COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH NONCOMBUSTIBLE MATERIALS. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOOR OF COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH MATERIALS EQUIVALENT TO TWO INCHES OF WOOD. FIRESTOPPING SHALL COMPLY WITH ASTM E-814.
31. MC SHALL PREPARE ALL EXPOSED DUCT, GRILLES, PIPING, AND UNITS FOR PAINTING. GC WILL BE RESPONSIBLE FOR PAINTING.
32. ALL CUTTING AND PATCHING OF WALLS AND FLOORS FOR MECHANICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

ENERGY REQUIREMENTS:
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

METHOD OF COMPLIANCE
PRESCRIPTIVE ☒ PERFORMANCE ☐ ENERGY COST BUDGET ☐

CLIMATE ZONE	3
THERMAL ZONE	
WINTER DRY BULB	23
SUMMER DRY BULB	91
INTERIOR DESIGN CONDITIONS	
WINTER DRY BULB	70
SUMMER DRY BULB	75
RELATIVE HUMIDITY	50
BUILDING HEATING LOAD (MBH)	-
BUILDING COOLING LOAD (MBH)	-
MECHANICAL SPACING CONDITIONING SYSTEM	
UNITARY	
DESCRIPTION OF UNIT	SEE SCHEDULES
HEATING EFFICIENCY	SEE SCHEDULES
COOLING EFFICIENCY	SEE SCHEDULES
HEAT OUTPUT OF UNIT	SEE SCHEDULES
COOLING OUTPUT OF UNIT	SEE SCHEDULES
BOILER	
TOTAL BOILER OUTPUT. IF OVERSIZED, STATE REASON.	NA
CHILLER	
TOTAL CHILLER OUTPUT. IF OVERSIZED, STATE REASON	NA
LIST EQUIPMENT EFFICIENCIES	SEE SCHEDULES
EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEMS)	
MOTOR HORSEPOWER	SEE SCHEDULES
NUMBER OF PHASES	SEE SCHEDULES
MINIMUM EFFICIENCY	SEE SCHEDULES
MOTOR TYPE	SEE SCHEDULES
NUMBER OF POLES	SEE SCHEDULES

DESIGNER'S STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIRMENTS OF THE N.C.S. ENERGY CODE.

SIGNED: ______
NAME: JACOB D. MCILVAIN
TITLE: MECHANICAL DESIGNER

MECHANICAL LEGEND

XxX	RECTANGULAR DUCT
X"φ	ROUND METAL DUCT
X"φ	FLEX/RIGID ROUND DUCT
	ELBOW WITH TURNING VANES
	VOLUME DAMPER
	SUPPLY TAP W/ WO VOLUME DAMPER
	SUPPLY DIFFUSER/GRILLE
	RETURN REGISTER/GRILLE
	EXHAUST REGISTER/GRILLE
	CEILING EXHAUST FAN
	SIDEWALL DIFFUSER/GRILLE
C	CONDENSATE DRAIN
R	REFRIGERANT PIPING
XX-N	MECHANICAL EQUIPMENT TYPE XX
T	T-STAT MOUNTED 46"AFF.
SD	DUCT SMOKE DETECTOR
M	MOTORIZED DAMPER
	LOUVERED DOOR (SEE ARCHITECTURAL DRAWINGS)
	3/4" DOOR UNDER CUT
FD	U.L. FIRE DAMPER W/ ACCESS DOOR
RD	U.L. CEILING RADIATION DAMPER
FSD	U.L. FIRE/SMOKE DAMPER W/ ACCESS DOOR

FAN SCHEDULE

UNIT NO.	SERVICE	AREA SERVED	CFM	S.P.	RPM	TYPE & ARRANGEMENT	MIN. MOTOR HP & VOLTAGE	MANUFACTURER & MODEL NO.	DRIVE	CONTROL SCHEME	NOTES
EF-1	EXHAUST	HANGAR	4500	0.25"	1124	SIDEWALL	1 HP 208/1	GREENHECK SBE-2120-7	BELT	C	1-8,10
EF-2	EXHAUST	HANGAR	4500	0.25"	1124	SIDEWALL	1 HP 208/1	GREENHECK SBE-2120-7	BELT	C	
EF-3	EXHAUST	TOILET	75 MIN	0.25"	950	CEILING	29 W/0.58A 120/1 PH	GREENHECK SP-A110	DIRECT	A	1-6
EF-4	EXHAUST	ELECT	100	0.25"	950	CEILING	29 W/0.58A 120/1 PH	GREENHECK SP-A110	DIRECT	A	1-6
SF-1	SUPPLY	HANGAR	4500	0.25"	1124	SIDEWALL	1 HP 208/1	GREENHECK SBE-2120-7	BELT	C	1-10
SF-2	SUPPLY	HANGAR	4500	0.25"	1124	SIDEWALL	1 HP 208/1	GREENHECK SBE-2120-7	BELT	C	1-9,11
CF-1	SUPPLY	HANGAR	0	-	98	CEILING	2 HP 208 VOLTS	BIG ASS SOLUTIONS BASIC 6	DIRECT		3-6
CF-2	SUPPLY	HANGAR	0	-	98	CEILING	2 HP 208 VOLTS	BIG ASS SOLUTIONS BASIC 6-16'	DIRECT		3-6

NOTES:
1. SCREEN
2. BACKDRAFT DAMPER
3. COLOR BY ARCHITECT
4. INTEGRAL DISCONNECT SWITCH
5. SPEED CONTROLLER NEAR FAN
6. PROVIDE STARTER AS REQUIRED
7. PROVIDE WITH CURVED BLADES
8. PROVIDE WEATHERHOOD WITH FILTERS
9. PROVIDE MOTORIXED DAMPER INTERLOCK WITH FAN OPERATION
10. INTERLOCK EF-1 AND SF-1 WITH EACH OTHER.
11. INTERLOCK EF-2 AND SF-2 WITH EACH OTHER.

CONTROL OPTIONS:
A. CONTROL W/ ROOM LIGHTS
B. CONTROL W/ THERMOSTAT
C. CONTROL W/ SWITCH
D. CONTINUOUS OPERATION
E. CONTROL W/ MFG KEYPAD CONTROLLER

EXHAUST CALCULATIONS

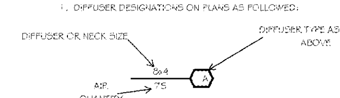
BASED ON 2018 NCMC TABLE 403.3

	Floor Area	Area Outdoor Air Rate cfm/sqft	People Outdoor Air Rate cfm/person	Occupant Density #/1000 S.F	Occupancy	Outdoor Air Required	Ventilation Effectiveness (Ez)	Total Outdoor Air Required
EXHAUST								
Hangar	9585	0.75	0	0	0	7189	0.8	8986
EXHAUST TOTAL OUTSIDE AIR REQUIRED								8986
EF-1 TOTAL OUTSIDE AIR PROVIDED								4500
EF-2 TOTAL OUTSIDE AIR PROVIDED								4500

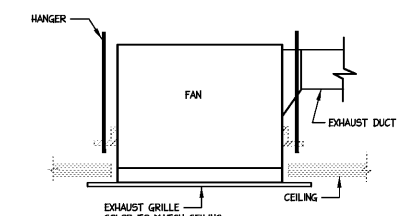
DIFFUSER SCHEDULE

SYMBOL	CFM	NECK SIZE	MODULE SIZE	FRAME TYPE	PATTERN	DAMPER	MATERIAL	SERVICE	FINISH	MANUFACTURER & MODEL NO.	NOTES
A	AS NOTED	AS NOTED	12x12	SURFACE	4-WAY	YES	STEEL	SUPPLY	NOTE 2	PRICE SMD	1

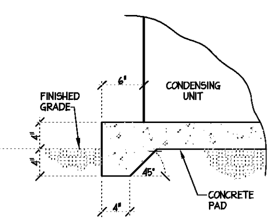
NOTES:
1. DIFFUSER DESIGNATIONS ON PLANS AS FOLLOWED:



2. FINISH TO MATCH/ BE ABLE MATCH CEILING OR WALL OR DOOR.
3. PROVIDE WITH U.L. LISTED RADIATION DAMPER.



2 EXHAUST FAN DETAIL (EF-3 AND EF-4)
NO SCALE



1 CONDENSING UNIT PAD DETAIL
NO SCALE

SPLIT SYSTEM HEAT PUMP UNIT SCHEDULE

AIR HANDLING UNIT DATA														HEAT PUMP										
			FAN DATA				COOLING		HEAT	AUX.	ELECTRICAL DATA			GENERAL DATA					ELECTRICAL DATA					
UNIT TAG	AREA SERVED	MANUF. MODEL	FAN CFM	ESP (WG)	MOTOR HP	OA (CFM)	TOTAL (MBH)	SENS. (MBH)	TOTAL (MBH)	HEAT (KW)	VOLTAGE (V/PH)	MCA (A)	MOCP (A)	UNIT TAG	MANUF. MODEL	TONNAGE	EFF. (SEER)	HSPF	VOLTAGE (V/PH)	MCA (A)	MOCP (A)	WEIGHT (LBS) AH/HP	NOTES
AH-1	OFFICE	DAIKIN FFQ18Q2VJU	[illegible]0	0.25"	45(W)	50	14.4	9.6	16.2	0	208/1	NA	NA	HP-1	DAIKIN RX18RMVJU	2.0	14	-	208/1	9.7	15	95	1-12

NOTES:
1. COOLING CAPACITIES ARE RATED IN ACCORDANCE WITH ARI STANDARD 210/240 AT 95 DEGREE FARHENHEIT AMBIENT OUTDOOR AIR TEMPERATURE, 80 DEGREE FARHENHEIT DRY BULB, AND 67 DEGREE FARHENHEIT WET BULB ENTERING AIR TEMPERATURE, AND NORMAL AIR QUANTITY LISTED.
2. REFRIGERANT PIPING TO BE SIZED PER TOTAL INSTALLATION EQUIVALENT LENGTH. LONG-LINE APPLICATION TO BE PROVIDED WHENEVER MANUFACTURER RECOMMENDED LENGTHS ARE EXCEEDED, INCLUDING LIQUID LINE SOLENOID VALVES, ACCUMULATOR, ETC. MAXIMUM T.E.L. IS 100'.
3. PROVIDE SINGLE POINT ELECTRICAL CONNECTION FOR AIR HANDLING UNIT.
4. PROVIDE 1 DAY FILTER WITH EACH UNIT AT TURNOVER TO OWNER.
5. OUTDOOR UNITS SHALL HAVE A MINIMUM 14.0 SEER RATING.
6. PROVIDE MANUFACTURERS 7-DAY PROGRAMMABLE AUTOMATIC CHANGEOVER HEAT/COOL THERMOSTAT. PROVIDE WITH OUTSIDE AIR TEMPERATURE SENSOR TO LOCKOUT ELECTRIC HEAT WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 40 DEGREES.
7. PROVIDE HEAT PUMP KIT WITH AIR HANDLER (IF REQUIRED).
8. PROVIDE A CASSETTE UNIT.
9. ALL ACCESSORIES AND OPTIONS ARE TO BE FACTORY INSTALLED.
10. RETURN AIR THROUGH FILTERED GRILLE.
11. DRAIN CONDENSATE TO BUILDING EXT.
12. CATALOG NUMBERS AND MANUFACTURERS ARE TO INDICATE TYPE AND QUALITY OF UNIT DESIRED. SUBMIT CUTSHEETS OF THESE AND ALTERNATE MANUFACTURERS FOR ARCHITECT AND OWNER APPROVAL PRIOR TO PURCHASE OF ANY UNITS. INFORMATION ON ALTERNATE UNITS PROPOSED BY THE CONTRACTOR SHALL INCLUDE THE ADD/ DEDUCT ASSOCIATED WITH ACCEPTANCE OF THAT UNIT (OR THE ALTERNATE PACKAGE AS A WHOLE).

UNIT HEATER SCHEDULE

TAG	LOCATION	MOUNTING	CAPACITY MBH	ELECTRICAL				MANUFACTURER & MODEL NO.	NOTES
UH-1	HANGER	SUSPEND	100	2.6A	120/1	1	60	SPACERAY LTS-100	1-6
UH-2	HANGER	SUSPEND	100	2.6A	120/1	1	60	SPACERAY LTS-100	1-6

NOTES:
1. REMOTE THERMOSTAT
2. MOUNT HEATER @ 12" BELOW STRUCTURE
3. UNIT DISCONNECT
4. U.L. LISTED
5. PROVIDE WITH PROPANE ACCESSORIES
6. PROPOSED - FIRED UNIT

REVISIONS

DATE	AUGUST 2, 2019
PROJECT NUMBER	9217-000

SHEET TITLE
MECHANICAL LEGENDS, NOTES AND SCHEDULES

SHEET NUMBER
M1

ML-1903-M1.dwg, Plotted By: Jake
Jul 31, 2019 — 1:24pm

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