

HVAC GENERAL NOTES

- MECHANICAL CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETE INSTALLATION AND OPERATION OF ALL SYSTEMS IN THIS SECTION OF WORK IN ACCORDANCE WITH RECOMMENDED PRACTICE AND ALL APPLICABLE CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
- DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WALLS, DOORS, WINDOWS, FURNITURE, LIGHTS, CEILING DIFFUSERS, ETC.
- ALL MECHANICAL PERMITS AND INSPECTION FEES SHALL BE OBTAINED AND PAID FOR BY THE MECHANICAL CONTRACTOR.
- MECHANICAL CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR ONE YEAR. REFRIGERANT COMPRESSORS SHALL BE GUARANTEED FOR FIVE YEARS. WARRANTY PERIOD SHALL BE EFFECTIVE THE DAY THE PROJECT IS ACCEPTED BY THE OWNER.
- DRAWINGS ARE DIAGRAMMATIC AND MAY NOT SHOW ALL REQUIRED FITTINGS. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE TYPE, SIZE AND LOCATION OF ALL AIR DEVICES, DUCTWORK, PIPING AND EQUIPMENT WITH THE CEILING PLAN, LIGHTS, STRUCTURAL ELEMENTS AND OTHER TRADES. MECHANICAL CONTRACTOR TO FURNISH AND INSTALL ALL BENDS, OFFSETS, ELBOWS, ETC. AS REQUIRED. VERIFY ALL CLEARANCES PRIOR TO FABRICATING DUCTWORK, OR ORDERING ANY EQUIPMENT, PIPING, ETC.
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING MATERIALS AND INSTALLING THE WORK IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
- DUCTWORK
  - ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS WITH A MINIMUM PRESSURE CLASSIFICATION OF 2, SEAL CLASS C, WITH A MAXIMUM LEAKAGE RATE OF 5X.
  - ALL SQUARE ELBOWS SHALL HAVE TURNING VANES.
  - ALL DUCT DIMENSIONS SHOWN ARE INTERNAL CLEAR DIMENSIONS.
  - PROVIDE A MANUAL BALANCING DAMPER AT ALL SUPPLY AND RETURN BRANCH TAKEOFFS, AS WELL AS ALL OUTSIDE AIR MAIN & BRANCH DUCTS.
  - FLEXIBLE DUCT, IF SHOWN ON DRAWINGS, SHALL BE INSULATED ROUND DUCT WITH AN OUTER GLASS REINFORCED SILVER NYLAR JACKET ENCLOSING GLASS FIBER INSULATION AROUND A CONTINUOUS INNER LINER, AND SHALL CONFORM TO THE REQUIREMENTS OF UL 181 FOR CLASS 1 FLEXIBLE AIR DUCTS. MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL BE 6 FEET. R-6 VALUE TO MEET/EXCEED ENERGY CODE (2015 IECC SECTION 403.2.8) DUCT INSULATION IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES.
  - ALL SHEET METAL DUCTWORK WITHIN 10' OF THE AIR HANDLING UNIT SHALL BE PROVIDED WITH ACOUSTICAL DUCT LINER. THIS IS IN ADDITION TO THERMAL INSULATION REQUIREMENTS.
  - ALL DUCT SYSTEMS ARE TO BE PER UL STANDARDS. DUCTS ARE TO BE INSTALLED WITH NO RESTRICTIONS AND AN ABSOLUTE MINIMUM AMOUNT OF AIR LEAKAGE.
  - ALL DUCT INSULATION SHALL BE RUN CONTINUOUSLY THROUGH FLOORS AND PARTITIONS.
- KITCHEN GREASE HOOD EXHAUST SHALL BE 16 GA. STEEL WITH LIQUID TIGHT WELDED JOINTS. DUCT SHALL SLOPE NOT LESS THAN 1/4" PER 1'-0" TOWARD THE HOOD PER IMC SECTION 508.3.7. WHERE HORIZONTAL DUCT RUNS EXCEED 75 FEET, THEN DUCT SHALL SLOPE NOT LESS THAN 1/8" PER 1'-0". PROVIDE GREASE TIGHT ACCESS DOORS OF THE SAME MATERIAL AS THE DUCT FOR CLEANING AT ALL CHANGES IN DIRECTION, AT 20' INTERVALS AND AT THE HOOD AND FAN CONNECTIONS.
- PIPING
  - CONDENSATE DRAINS SHALL BE TYPE L COPPER WITH SOLDERED JOINTS WHEN INSTALLED BELOW CEILING LEVEL. DRAINS INSTALLED IN A RETURN AIR PLENUM SHALL BE TYPE L COPPER WITH SOLDERED JOINTS OR SCHEDULE 40 CPVC.
  - REFRIGERANT PIPING SHALL BE TYPE ACR WROUGHT COPPER WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS.
  - REFRIGERANT COMPONENTS SHALL BE PRESSURE TESTED IN ACCORDANCE WITH ASHRAE 15.
  - MECHANICAL CONTRACTOR SHALL PROVIDE REFRIGERANT PIPING FOR ALL MECHANICAL SYSTEMS WITHIN THIS SCOPE OF WORK. COORDINATE ROUTING AND INSTALLATION WITH THE GENERAL CONTRACTOR. SIZE REFRIGERANT LINES PER MANUFACTURERS REQUIREMENTS.
- INSULATION
  - DUCT LINER - FIBROUS GLASS DUCT LINER, WITH COATED SURFACE EXPOSED TO AIR STREAM. APPLY WITH MECHANICAL FASTENERS AND 100% COVERAGE OF ADHESIVE. LINER TO BE COATED WITH AN EPA REGISTERED ANTI-MICROBIAL AGENT. DUCT INSULATION VALUE IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES. DUCT LINER USED FOR ACOUSTICAL PURPOSES ONLY SHALL BE 1" THICK.
  - DUCT WRAP - MINERAL FIBER BLANKET, WITH REINFORCED FOIL AND PAPER VAPOR RETARDANT JACKET. APPLY WITH MECHANICAL FASTENERS AND ADHESIVE. DUCT INSULATION IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES.
  - AIR DISTRIBUTION - INSULATE THE TOP-SIDE OF ALL AIR DISTRIBUTION DEVICES.
- ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS & ROOF SHALL BE FLASHED & COUNTER-FLASHED IN A WATERPROOF MANNER.
- EXTEND ALL CONDENSATE DRAINS TO A SPLASH BLOCK LOCATED ON ROOF OR AS REQUIRED PER CODE. DRAINS FROM MECHANICAL EQUIPMENT SHALL BE PROVIDED W/ A DEEP SEAL TRAP. SLOPE CONDENSATE DRAIN PIPING AT MIN. 1/8" PER FOOT.
- LOCATE ALL THERMOSTATS, SWITCHES AND OTHER CONTROL DEVICES AT 4'-0" ABOVE FINISHED FLOOR. FURNISH A THERMOSTATIC CONTROL DEVICE FOR EVERY DEVICE REQUIRING ONE WHETHER SHOWN ON DRAWINGS OR NOT.
- ALL EQUIPMENT SHALL BE INSTALLED PER CODE & MANUFACTURERS REQUIREMENTS FOR PROPER OPERATION AND SERVICE/ACCESS CLEARANCES.
- ALL EQUIPMENT SHALL BE UL LISTED.
- MECHANICAL CONTRACTOR SHALL CONTRACT A CERTIFIED 3RD PARTY TEST & BALANCE COMPANY TO BALANCE ALL MECHANICAL SYSTEMS TO AIR QUANTITIES INDICATED ON PLANS AND PROVIDE A COMPLETE BALANCING REPORT IN ACCORDANCE WITH NEBB OR AABC STANDARDS.
- CONTROL WIRING FOR ALL MECHANICAL SYSTEMS WITHIN THIS SCOPE OF WORK SHALL BE BY THE MECHANICAL CONTRACTOR.
- DUCT SMOKE DETECTORS SHALL BE INSTALLED IN THE SUPPLY AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS OR DECONTAMINATION EQUIPMENT UPON ACTIVATION THE SMOKE DETECTOR SHALL SHUT DOWN THE AIR HANDLING UNIT.
  - \* IF THERE IS A FIRE ALARM SYSTEM, DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR. ACTIVATION OF THE DUCT SMOKE DETECTOR SHALL INITIATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION.
  - \* IF THERE IS NOT A FIRE ALARM SYSTEM, DETECTORS SHALL BE FURNISHED, WIRED AND INSTALLED BY THE MECHANICAL CONTRACTOR. ACTIVATION OF THE DUCT SMOKE DETECTOR SHALL INITIATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION.
- PROVIDE A CLEAN SET OF FILTERS FOR ALL AIR HANDLING EQUIPMENT AT SUBSTANTIAL COMPLETION.
- MAINTAIN A MINIMUM 10'-0" BETWEEN OUTDOOR AIR INTAKES AND EXHAUST FAN DISCHARGE AND PLUMBING VENTS, ETC. FIELD COORDINATE FINAL LOCATIONS.
- ROOF CURBS SHALL HAVE A BASE THAT FITS SLOPE AND TYPE OF ROOF AS REQUIRED. TOP OF CURB SHALL BE LEVEL. SEE STRUCTURAL PLANS FOR SLOPE INFORMATION AND ARCHITECTURAL PLANS FOR EXACT ROOF TYPE.
- RUN DUCT UP WITHIN STRUCTURE OR THROUGH JOIST WEBS WHERE POSSIBLE & WHERE REQUIRED TO MAINTAIN CEILING HEIGHTS. PROVIDE OFFSETS AND/OR TRANSITIONS IN DUCT WHERE REQUIRED WITH MAX. 45 DEG. ELBOWS. MAKE BRANCH TAKEOFFS ON SIDES OR BOTTOMS AS REQUIRED. NO BACK TO BACK 90 DEG. ELBOWS ALLOWED.
- ALL EQUIPMENT SHALL BE LABELED ACCORDING TO NUMBERING / IDENTIFICATION SYSTEM FOR PLANS.
- ALL EQUIPMENT SUPPORTS ARE REQUIRED TO MEET AS REQUIRED.
- MECHANICAL CONTRACTOR SHALL PROVIDE UL LISTED FIRE DAMPERS, RADIATION DAMPERS AND/OR FIRE/SMOKE DAMPERS WHERE REQUIRED FOR FIRE PROTECTION AS REQUIRED BY LOCAL CODES. M.C. SHALL PROVIDE KEYS TO ACCESS TO TEST & RESET ALL SUCH DAMPERS AND/OR ACTUATORS.
- ON MAKING PIPE CONNECTIONS TO EQUIPMENT, CARE SHOULD BE TAKEN TO ARRANGE PIPES SO AS NOT TO INTERFERE WITH OPENING OF ACCESS DOORS.
- ELECTRICAL CONTRACTOR TO PROVIDE ALL HIGH VOLTAGE (120V AND GREATER) ELECTRICAL WIRING, CONDUIT, DISCONNECT SWITCHES, FUSES, ETC. TO ALL MECHANICAL EQUIPMENT WITHIN THIS SCOPE OF WORK. ALL ELECTRICAL CONNECTIONS ARE BY ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE ELECTRICAL REQUIREMENTS FOR ALL APPROVED MECHANICAL EQUIPMENT WITH THE ELECTRICAL CONTRACTOR.
- PRIOR TO BEGINNING ANY WORK, MECHANICAL CONTRACTOR IS RESPONSIBLE TO NOTIFY THE OWNERS REPRESENTATIVE, ARCHITECT OR ENGINEER IF THE MECHANICAL DESIGN CONFLICTS WITH EXISTING OR UNFORESEEN FIELD CONDITIONS.
- MECHANICAL CONTRACTOR SHALL PROVIDE A MIN OF FOUR COPIES OF SHOP DRAWINGS TO THE ARCHITECT/ENGINEER FOR ALL INSTALLED EQUIPMENT AND MATERIALS NEEDING APPROVAL PRIOR TO PURCHASING. IN ADDITION, M.C. SHALL PROVIDE THE OWNER WITH TWO COPIES OF OPERATION & MAINTENANCE MANUALS FOR ALL INSTALLED EQUIPMENT, MANUFACTURERS & INSTALLERS WARRANTIES AND TRAINING FOR CONTROLS OF ALL SUCH EQUIPMENT.

PACKAGED DX COOLING / GAS HEATING ROOF TOP UNIT SCHEDULE

UNIT DESIG.	NOMINAL COOLING (TONS)	SUPPLY - FAN DATA				COOLING CAPACITY		HEATING CAPACITY		FILTER DATA		ELECTRICAL DATA				CONTROL SCHEME	MANUFACTURER & MODEL NO.	WEIGHT (LBS)	ACCESSORIES/ NOTES			
		TOTAL AIRFLOW (CFM)	MINIMUM O.A. (CFM)	MINIMUM E.S.P. (IN.WG)	FAN SPEED (RPM)	TOTAL (MBH)	SENSIBLE (MBH)	INPUT (MBH) (H/L/O)	OUTPUT (MBH) (H/L/O)	TYPE	THICK (IN)	FACE VELOCITY (FT/MIN)	VOLTS/PH	FLA	MCA/MOCP					COOLING EFFICIENCY (EER)	HEATING EFFICIENCY (OUT/IN)	
RTU-1	6.0	2,400	550	0.5	BY MFG.	2.75	73.6	64.4	150.0/105.0	121.5/85.1	THROWAWAY	2	-	208/3	33.1	37/50	13.1	80.0X	THERMOSTAT	TRANE YHC74E3	1,100	1 - 10
RTU-2	6.0	2,400	550	0.5	BY MFG.	2.75	73.6	64.4	150.0/105.0	121.5/85.1	THROWAWAY	2	-	208/3	33.1	37/50	13.1	80.0X	THERMOSTAT	TRANE YHC74E3	1,100	1 - 10
RTU-3	6.0	2,400	200	0.5	BY MFG.	2.75	73.6	64.4	150.0/105.0	121.5/85.1	THROWAWAY	2	-	208/3	33.1	37/50	13.1	80.0X	THERMOSTAT	TRANE YHC74E3	1,100	1 - 10
RTU-4	6.0	2,400	200	0.5	BY MFG.	2.75	73.6	64.4	150.0/105.0	121.5/85.1	THROWAWAY	2	-	208/3	33.1	37/50	13.1	80.0X	THERMOSTAT	TRANE YHC74E3	1,100	1 - 10

NOTES

- COOLING CAPACITIES ARE RATED IN ACCORDANCE WITH ARI STANDARD 210/290 AT 84° AMBIENT OUTDOOR AIR TEMP, 80° DRY BULB, 67° WET BULB ENTRANCE AIR TEMP, AND NOMINAL AIR QUANTITY LISTED.
- PRE-FABRICATED ROOF CURB
- PROVIDE W/ 7-DAY PROGRAMMABLE THERMOSTAT W/ REMOTE SPACE TEMPERATURE SENSOR. THERMOSTAT TO BE HONEYWELL VISIONPRO TH8321 W/ CASE LOCK; SPACE SENSOR TO BE HONEYWELL C7189.
- FIELD MOUNTED DISCONNECT SWITCH - TO BE PROVIDED & INSTALLED BY E.C.
- PROVIDE NEW HIGH EFFICIENCY FILTERS FOR EACH UNIT. FILTERS SHOULD BE REPLACED REGULARLY.
- LOW AMBIENT CONTROL.
- VERTICAL SUPPLY DISCHARGE & RETURN.
- PROVIDE DUEL ENTHALPY ECONOMIZER AND BAROMETRIC RELIEF.
- ROUTE CONDENSATE TO SPLASH BLOCK.
- PROVIDE HOT GAS BYPASS.

FAN SCHEDULE

UNIT DESIG.	SERVICE	AREA SERVED	MANUFACTURER & MODEL NO.	FAN TYPE & ARRANGEMENT	AIRFLOW (CFM)	MIN. E.S.P. (IN.WG)	FAN SPEED (RPM)	NOTE	DRIVE TYPE	HP/WATTS	VOLTS/PH	CONTROL SCHEME	ACCESSORIES/ NOTES
KEF-1	EXHAUST	NEW TYPE-1 HOOD	CARNHAM HRE-20	ROOFTOP UPBLAST	3900	1.2	BY MFG.	BY MFG.	BELT	3 HP	208V/3	B	4, 7 - 11
KSF-1	MAKEUP AIR	NEW TYPE-1 HOOD	SEE SCHEDULE M6 FOR SCHEDULES & DETAILS										
EF-1	EXHAUST	UNISEX TOILET	GREENHECK SP-570	CENTRIFUGAL	150	0.10	BY MFG.	0.53 A	DIRECT	16 W	120V/1	A	1 - 6
EF-2, EF-3	EXHAUST	MEN'S - WOMEN'S RESTROOM	GREENHECK SP-570	CENTRIFUGAL	150	0.25	BY MFG.	1.7 A	DIRECT	128 W	120V/1	A	1 - 6
EF-4	EXHAUST	JANITOR	GREENHECK SP-570	CENTRIFUGAL	75	0.10	BY MFG.	0.53 A	DIRECT	16 W	120V/1	A	1 - 6

NOTES

- SCREEN
  - BACKDRAFT DAMPER
  - COLOR BY ARCHITECT
  - DISCONNECT SWITCH
  - UL LISTED
  - VIBRATION ISOLATION
  - 24" HINGED CURB
  - GREASE CUP
  - BELT DRIVEN
  - PROVIDED BY OWNER, INSTALLED M.C.
- CONTROL  
 A. INTERLOCK W/ LIGHTS  
 B. INTERLOCK WITH KSF-1, HOOD, 1 AND RTU-4

DIFFUSER SCHEDULE

SYMBOL	CFM	NECK SIZE	MODULE SIZE	FRAME TYPE	PATTERN	DAMPER	MATERIAL	SERVICE	FINISH	MANUFACTURER & MODEL NO.	ACCESSORIES/ NOTES
(A)	AS NOTED	AS NOTED	AS NOTED	DUCT MOUNTED	FIXED	YES	ALUMINUM	SUPPLY	NOTE 2	HART & COOLEY SVH	1, 2
(B)	AS NOTED	AS NOTED	12x2	LAY-IN	4-WAY	YES	PLASTIC	SUPPLY	NOTE 2	HART & COOLEY RZ504	1, 2
(C)	AS NOTED	AS NOTED	23-1/2x23-1/2	LAY-IN	FIXED	YES	PLASTIC	SUPPLY	NOTE 2	HART & COOLEY RZ5RT	1, 2, 4
(D)	AS NOTED	AS NOTED	23-1/2x23-1/2	LAY-IN	EGGCRATE	NO	PLASTIC	RETURN	NOTE 2	HART & COOLEY RZREF5T	1 - 4

NOTES

- DIFFUSER DESIGNATIONS ON PLANS AS FOLLOWS:  
 DIFFUSER OR NECK SIZE AIR QUANTITY  $\frac{8 \times 4}{75}$  (A) DIFFUSER TYPE AS NOTED ABOVE
- FINISH TO MATCH CEILING, WALL, STRUCTURE OR DUCT. COORDINATE FINISH W/ ARCHITECT.
- PROVIDE # STANDARD FILTER.
- DIFFUSER MUST BE PROVIDED WITH REZZIN BACK PANEL. NECK SIZES SHOWN ON MECHANICAL FLOOR PLAN ARE THE NECK SIZES FOR BACK PANEL.

MECHANICAL LEGEND

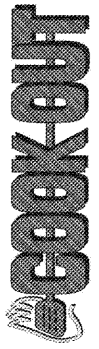
	SUPPLY DIFFUSER	EF	EXHAUST FAN
	EXIST. SUPPLY DIFFUSER	GF	GAS FURNACE
	RETURN GRILLE	AHU	AIR HANDLING UNIT
	EXIST. RETURN GRILLE	HP	HEAT PUMP UNIT
	CEILING EXHAUST FAN/GRILLE	AC	AIR CONDITIONING UNIT
	EXIST. EXHAUST FAN/GRILLE	S.A.	SUPPLY AIR
	THERMOSTAT AT 48° AFF	R.A.	RETURN AIR
	SPACE SENSOR AT 48° AFF	O.A.	OUTSIDE AIR
	SMOKE DETECTOR	E.A.	EXHAUST AIR
	REMOTE PULL STATION	M.P.	MEDIUM PRESSURE
	SQUARE DUCT	L.P.	LOW PRESSURE
	ROUND METAL DUCT	SP	STATIC PRESSURE
	ROUND FLEX DUCT	REL.	RELOCATE
	EXISTING DUCT/EQUIPMENT	V.D.	VOLUME DAMPER
*****	DUCT/EQUIP. TO BE DEMOD	CFM	CUBIC FEET PER MINUTE
	DUCT ELBOW W/TURNING VANES	BDD	BACK DRAFT DAMPER
	CONNECT TO EXISTING	AFF	ABOVE FINISHED FLOOR
	FIRE DAMPER	+	DOOR UNDER CUT 1-1/2"
	CEILING RADIATION DAMPER	+	DOOR LOUVER AT 12° AFF
M.C.	MECHANICAL CONTRACTOR	—○	PIPE UP
E.C.	ELECTRICAL CONTRACTOR	—○	PIPE DOWN
P.C.	PLUMBING CONTRACTOR	>>>	TURNING VANES

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Mk	Date	Description
		Revisions

MECHANICAL SCHEDULES, NOTES AND LEGEND

Date	06/13/19
Drawn By	SRP
Check By	NMP
Job No.	19-037
Sheet	

M1