

HVAC GENERAL NOTES

- ALL CONTROL WIRING SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF NFPA 70. ALL WIRING SHALL BE CONCEALED.
- CONTRACTOR SHALL INSTALL ALL ROOF CURBS FOR ROOFTOP UNITS LEVEL TO HORIZON AT (4) CORNERS.
- AIR TEST AND BALANCE REQUIRED BY INDEPENDENT TAB CONTRACTOR AABC OR NEBS CERTIFIED. SEE TEST AND BALANCE SCOPE ON THIS SHEET.
- EXISTING SMOKE DETECTORS TO REMAIN AND BE REUSED.
- LENNOX START UP TECH SHALL PROGRAM THE PRODIGY[®] BOARDS IN ALL NEW RTU'S. CORE BOARDS SHALL BE PROGRAMMED PRIOR TO CSUBA RECOMMISSIONING THE EMS.
- CONTRACTOR SHALL PROVIDE CLEAN FILTERS IN ROOFTOP UNITS PRIOR TO AIR BALANCE AND AGAIN PRIOR TO OWNER ACCEPTANCE.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2012 INTERNATIONAL MECHANICAL CODE AND THE 2018 INTERNATIONAL FUEL GAS CODE WITH LOCAL AMENDMENTS. ALL EQUIPMENT AND MATERIALS CAPABLE OF BEING UL LABELED OR SHALL BEAR THE UL LABEL.
- CONTRACTOR SHALL PROVIDE A GASKET BETWEEN BASE OF ROOF MOUNTED FANS AND ROOF CURBS TO PROVIDE AN AIRTIGHT JOINT.
- PROVIDE MISCELLANEOUS STEEL AND/OR WOOD BLOCKING AND SUPPORT AT ROOF CURBS AND OPENINGS AS REQUIRED TO SUPPORT ROOF AND EQUIPMENT. SPECIFIC REQUIREMENTS SHALL BE VERIFIED WITH STRUCTURAL ENGINEER AND APPROVED EQUIPMENT DRAWINGS PRIOR TO PLACEMENT.
- NEW SUPPLY AND EXHAUST DUCT SHALL BE 2.0 IN PRESSURE CLASS.
- NEW DUCT SHALL HAVE PAINT GRIP FINISH AND BE EITHER GALVANNEALD OR MILL PHOSPHATIZED.
- ANY NEW SUPPLY DUCT SHALL BE INTERNALLY INSULATED WITH 1" DUCT LINER EQUAL TO Owens Corning AcoustiTex 1.5 LB DENSITY, R-3.9. NEW EXHAUST DUCT TO ERV'S IS NOT REQUIRED TO BE INSULATED.

ROOFTOP UNIT NOTES

- CARMAX AUTO SUPERSTORE, LLC HAS A NATIONAL ACCOUNT WITH LENNOX INDUSTRIES, INC. FOR PRICING AND DELIVERY OF PACKAGED ROOFTOP UNITS IN ACCORDANCE WITH THE FOLLOWING. NO SUBSTITUTIONS WILL BE ALLOWED.
 - ROOFTOP UNITS SHALL BE AS SCHEDULED. THE ELECTRICAL PACKAGE SHALL INCLUDE:
 - UNIT DISCONNECT (INSTALLED AND WIRED)
 - BOTTOM GAS/POWER ENTRY
 - STANDARD LOW AMBIENT CONTROL
 - DUAL 120V GFCI TYPE OUTLETS (TO BE FIELD WIRED)
 - GLOBAL DRY BUILD ECONOMIZERS W/FAN POWERED EXHAUST (1ST AND LARGER UNLESS OTHERWISE NOTED)
 - GLOBAL ECONOMIZERS W/BAROMETRIC RELIEF (6" AND SMALLER)
 - STAINLESS STEEL HEAT EXCHANGER AND FRESH AIR TEMPERING FOR BYPASS RTU'S AND RTU'S THAT HAVE AN ERV
 - THE LENNOX NATIONAL ACCOUNT CONTACT IS: RON JOHNSON 704-621-2606
 - HVAC EQUIPMENT PERFORMANCE CHECK (EPC)

UPON COMPLETION OF THE HVAC INSTALLATION AND STARTUP, THE OWNER'S SERVICE CONSULTANT, AT THE OWNER'S EXPENSE, IS TO INSPECT THE JOB AND PERFORM AN EPC. THIS EPC WILL AID THE CONTRACTOR IN CHECKING EACH MACHINE FOR PROPER OPERATION, CHECKING THE CONTROL PANEL AND ADJUSTING CONTROLS AS NECESSARY.

THE OWNER'S SERVICE CONSULTANT: COMFORT SYSTEMS ATTN: VALERIE BEDEL P: 311-246-5181 valerie.beidel@comfortsystemsusa.com

ALL PROBLEMS DISCOVERED WITH THE EQUIPMENT OR ITS INSTALLATION (EXCLUDING NOVAR INSTALLATION) SHALL BE CORRECTED BY THE HVAC SUBCONTRACTOR IN ACCORDANCE WITH THE OWNER'S SERVICE CONSULTANT.

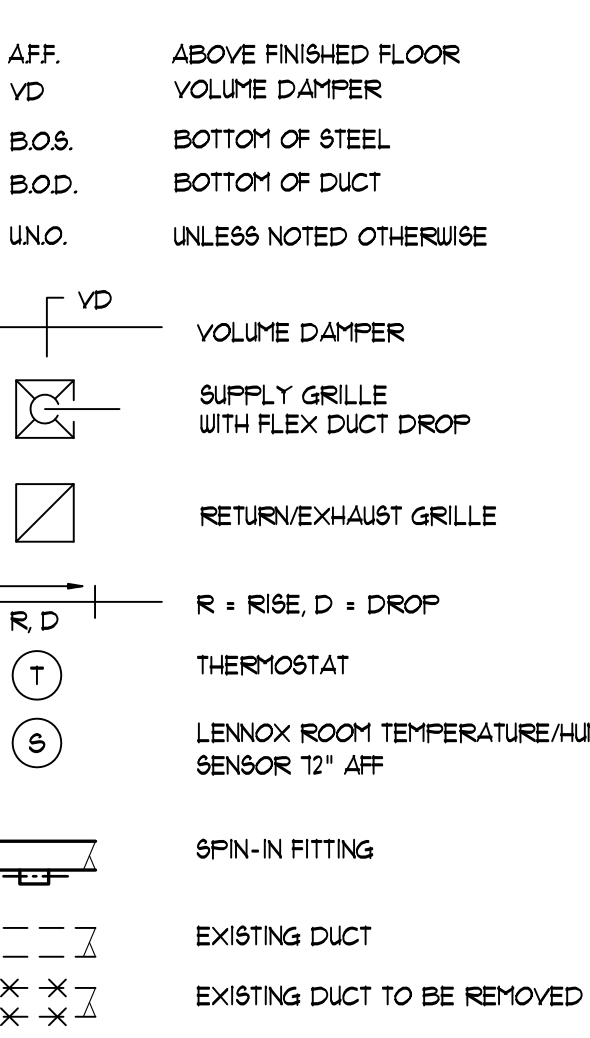
AFTER ALL PROBLEMS HAVE BEEN CORRECTED, CARMAX AUTO SUPERSTORE, LLC SHALL VERIFY ALL EQUIPMENT IS OPERATING PROPERLY THROUGH THE NOVAR CONTROLLERS.

PRIOR TO PERFORMANCE OF THE EPC, THE CONTRACTOR SHALL HAVE SET AND CONNECTED ALL COMPONENTS. COMPLETED THE POWER WIRING, CONNECTED ALL PIPING, REMOVED ALL SHIPPING BLOCKS, COMPLETED THE STARTUP OF ALL UNITS AND FURNISHED THE PRE-EPC CHECKLIST TO THE OWNER'S SERVICE CONSULTANT.

THE EPC INCLUDES A FULL WRITTEN REPORT. COPIES WILL BE SENT TO THE GENERAL CONTRACTOR AND CARMAX AUTO SUPERSTORE, LLC. COPIES OF THE EPC SHALL BE INCORPORATED IN TO THE O 4 M MANUALS BY THE GENERAL CONTRACTOR.

- RTU AIR FILTERS SHALL BE CANFIL FARR AEROPLEAT III PLEATED 2" THICK MERV 13, OR EQUAL. MARK FILTERS WITH INSTALLATION DATE.
- THE PACKAGE COMPONENTS WILL BE CLEARLY LABELED (IN LEGIBLE FONT) ON THE EXTERIOR OF ALL BOXES OR CRATES.
- SUBMIT RTU SUBMITTALS IN PDF FORMAT TO THE ENGINEER FOR APPROVAL.

HVAC LEGEND



ROOFTOP UNIT SCHEDULE

(SHOWN FOR REFERENCE ONLY)

MARK	ZONE	EER	THERM EFF	VOLT/PH	FAN DATA				COOLING DATA			GAS DATA		MIN. O/A CFM	MODEL	WEIGHT	REMARKS (1)
					CFM	TSP IN UC	ESP IN UC	HP	EAT DB/AUB	TOTAL MBH	SENSIBLE MBH	INPUT MBH	OUTPUT MBH				
RTU-1	SHOWROOM	12.2	80	480/3	6000	.78	.6	3.0	76.6/63.9	156.8	149.6	26.0	208	76.0	LENNOX LGC166H	2900	
RTU-2	SHOWROOM	11.0	80	480/3	4500	1.04	.6	3.0	76.6/63.9	125.3	99.8	130	104	34.0	LENNOX LGA120H	1600	
RTU-3	CUSTOMER	11.2	80	480/3	1200	.63	.6	1.5	79.6/65.4	36.8	28.8	78	62.4	20.0	LENNOX LGA036H	900	
RTU-4	BUSINESS	11.2	80	480/3	1150	.62	.6	1.5	80.3/65.6	36.6	28.6	78	62.4	20.0	LENNOX LGA036H	900	
RTU-5	BUYERS	11.2	80	480/3	1051	.62	.6	1.5	80.9/66.1	36.4	27.4	78	62.4	20.0	LENNOX LGA036H	900	
RTU-6	DATA/PBX	11.2	80	480/3	960	.63	.6	1.5	74.6/71	34	23	-	-	-	LENNOX LGA036H	900	
RTU-7	BREAK/CONF	11.3	80	480/3	1300	.63	.6	1.5	78/65.1	42.8	31.3	78	62.4	24.0	LENNOX LGA042H	900	
RTU-8	PARTS	11.2	80	480/3	1200	.63	.6	1.5	81.9/65.6	36.9	30.4	78	62.4	16.0	LENNOX LGA036H	900	
RTU-9	BREAK/TRAIN	11.0	80	480/3	1900	.63	.6	1.5	79.8/67.1	63.5	45.4	78	62.4	48.0	LENNOX LGA060H	900	
RTU-10	SERVICE AREA (BP)	11.0	80	480/3	7000	1.1	.8	5.0	84.7/66	298.7	184.7	470	376	52.00	LENNOX LGC300H	4900	(2)
RTU-11	SERVICE AREA (BP)	11.0	80	480/3	7000	1.1	.8	5.0	84.7/66	298.7	184.7	470	376	52.00	LENNOX LGC300H	4900	(2)
RTU-12	SERVICE AREA (BP)	11.0	80	480/3	7000	1.1	.8	5.0	84.7/66	298.7	184.7	470	376	52.00	LENNOX LGC300H	4900	(2)
RTU-13	SERVICE AREA (BP)	11.0	80	480/3	7000	1.1	.8	5.0	84.7/66	298.7	184.7	470	376	52.00	LENNOX LGC300H	4900	(2)
RTU-14	SERVICE AREA (BP)	11.0	80	480/3	7000	1.1	.8	5.0	84.7/66	298.7	184.7	470	376	52.00	LENNOX LGC300H	4900	(2)
RTU-15	COSMETIC AREA (BP)	11.0	80	480/3	5600	.88	.8	5.0	86.8/71.8	252.7	157.4	470	376	45.00	LENNOX LGA240H	4900	(2)
RTU-16	COSMETIC AREA (BP)	11.3	80	480/3	5600	.88	.8	5.0	86.8/71.8	252.7	157.4	470	376	45.00	LENNOX LGA240H	4900	(2)
RTU-17	FGC	11.3	80	480/3	3000	.91	.6	2.0	80/67	93.8	67.5	130	104	30.0	LENNOX LGA030H	1600	

- PROVIDE WITH FACTORY INSTALLED NOVAR CONTROL MODULE: LGA UNIT SERIES (MODEL 2051) LENNOX AS6 BOARD, F.A.T.
- BY PASS CURB AND BY PASS MIXING BOX

PIPING GENERAL NOTES

- ANY NEW GAS PIPING SHALL BE ASTM A-100, SCHEDULE 40, BLACK STEEL WITH 150 LB. MALLEABLE IRON SCREWED FITTINGS.
- ANY NEW EXTERIOR GAS PIPE SHALL BE PAINTED WITH RUST PROHIBITIVE PAINT.

CONTROLS SCOPE OF WORK:	
EXISTING RTU'S ARE ON LOGIC ONE BUS. SAVVY COMMUNICATIONS TO ICM ALL RTU'S WITH ETH 2051'S IO IS BY THE INTEGRATED ICM IN THE SAVVY.	
1. ALL NEW RTU'S WILL BE BACNET.	
2. THE GENERAL CONTRACTOR SHALL RETAIN COMFORT SYSTEMS USA (CSUSA) TO FURNISH AND INSTALL CONTROLS AS INDICATED BELOW. THE CONTACT AT CSUSA IS: VALERIE BEDEL 311-246-5181	
3. PROVIDE PRE-CONSTRUCTION SCREEN SHOTS FROM NOVAR EMS MONITORING TO INCLUDE UNIT STATUS, MODULE COMMUNICATIONS STATUS AND ACTIVE ALARMS.	
4. NOT USED	
5. CONNECT NEW RTU'S W/CORE BOARDS TO BACNET COMMUNICATION.	
6. FOR NEW RTU'S REPLACE RTU NOVAR TEMPERATURE SENSORS WITH LENNOX SENSORS.	
7. REPLACE/UPGRADE SAVVY 31 WITH OPUS XCM108 PANEL. SAME BASE PLATE. MINIMAL RE-WIRING REQUIRED.	
8. CONNECT BACNET NETWORK AS REQUIRED.	
9. TURN OVER SAVVY 31 PANEL AND ETH'S TO CARMAX FOR FUTURE SERVICE CALL INVENTORY SHIP TO COMFORT SYSTEMS USA, ATTN VALERIE BEDEL, CARMAX EMS ACCOUNT CO-ORDINATOR.	
10. UPDATE SOFTWARE PER NEW CARMAX TEMPLATE	
11. COMMISSION EMS SYSTEM	
12. PROVIDE POST CONSTRUCTION SCREEN SHOTS FROM NOVAR EMS MONITORING TO INCLUDE UNIT STATUS, MODULE COMMUNICATIONS STATUS AND ACTIVE ALARMS.	
13. LENNOX/CARMAX RTU SET UP SHEET IS TO BE COMPLETED UPON UNIT STARTUP. A COMPLETED SHEET IS TO BE LEFT IN EACH NEW RTU AND A COPY SUBMITTED WITH CLOSE OUT DOCUMENTATION FOR EACH NEW RTU.	
14. FURNISH AND INSTALL ADDITIONAL CONTROL WIRE FOR CO2 SENSORS AND UNITS WITH HUMIDITROL.	
15. ALL CONTROL COMMUNICATIONS BUS AND SENSOR WIRING NEW AND EXISTING, IS PART OF THE CONTROLS CONTRACTOR SCOPE OF WORK. REPLACE ANY DAMAGED WIRE.	

TEST & BALANCE SCOPE					
MARK	TOTAL AIR ACROSS COIL	OUTSIDE AIR	BYPASS AIR	SUPPLY AIR TO REGISTERS	OTHER
RTU-1 THRU 9 RTU-17	AS SCHEDULED	AS SCHEDULED	**	**	**
RTU-10 & 13	4900	4900	**	**	AIR QTY AT REGISTERS. SEE DETAIL 4M140 OUTSIDE AIR & EXHAUST AT ERV-1
EF-15 & 18 EF-20 & 21	**	**	**	**	EXHAUST AT FAN AS SCHEDULED AND AS SHOWN ON IM120
RTU-11, 12 & 14	7000	4750	2250	4750	AIR QTY AT REGISTERS. 4#105 CFM EACH
RTU-15 & 16	5600	4000	1600	4000	AIR QTY AT REGISTERS. SEE IM120

- SUGGESTED TEST & BALANCE PROCEDURE FOR BYPASS UNITS:**
- RTU-11, 12 & 14
- CLOSE BYPASS DAMPER & MAKE AIR QTY 7000 CFM.
 - GRADUALLY OPEN BYPASS DAMPER UNTIL OUTSIDE AIR IS 4750 CFM. THIS MEANS 2250 CFM IS BEING BYPASSED IN THE CURB.
 - OUTSIDE AIR SHOULD EQUAL SUM OF SUPPLY AIR AT THE REGISTERS
- RTU-15 & 16
- CLOSE BYPASS DAMPER & MAKE AIR QTY 5600 CFM.
 - GRADUALLY OPEN BYPASS DAMPER UNTIL OUTSIDE AIR IS 4000 CFM. THIS MEANS 1600 CFM IS BEING BYPASSED IN THE CURB.
 - OUTSIDE AIR SHOULD EQUAL SUM OF SUPPLY AIR AT THE REGISTERS

ROOFTOP UNIT SCHEDULE (OMAHA)

MARK	ZONE	EER (SEER)	VOLT/PH	FAN DATA				COOLING DATA (3)			GAS DATA		MIN. O/A CFM	MODEL (1)	WEIGHT	REMARKS (2,4,5,14)
				CFM	TOT N/UC	ESP IN UC	HP	EAT DB/AUB	TOTAL MBH	SENSIBLE MBH	INPUT MBH	OUTPUT MBH				
RTU-1	SHOWROOM	12.0	480/3	6,000	11	80	3.0	80/67	**	**	26.0	208	76.0	LENNOX LGT064H4M	2500	(6) (15)
RTU-2	SHOWROOM	12.1	480/3	4,500	15	80	3.75	80/67	**	**	13.0	104	34.0	LENNOX LGT064H4E	1400	(6) (5) (11)
RTU-3	CUSTOMER	12.8	480/3	1,200	8.0	6	5	80/67	**	**	6.5	53	20.0	LENNOX LGT036H4E	1020	(6) (12) (16)
RTU-4	BUSINESS	13.3	480/3	1,150	8.0	7	5	80/67	**	**	6.5	53	20.0	LENNOX LGT036H4E	1020	(6) (12) (16)
RTU-5	BUYERS	12.8	480/3	1,050	8.0	6	5	80/67	**	**	6.5	53	20.0	LENNOX LGT036H4E	1020	(6) (12) (16)
RTU-6	DATA/PBX	(11.0)	480/3	975	8.2	7	5	72/65	**	**	**	**	**	LENNOX LCT036H4E	850	(6) (16)
RTU-7	BREAK/CONF	12.8	480/3	1,300	9.0	7	1.0	80/67	**	**	6.5	53	24.0	LENNOX LGT048H4E	1020	(6) (12) (16)
RTU-8	PARTS	12.8	480/3	1,200	9.0	7	5	80/67	**	**	6.5	53	16.0	LENNOX LGT036H4E	1020	(6) (12) (16)
RTU-9	BREAK/TRAIN	12.7	480/3	1,900	10	7	1.0	80/67	**	**	10.8	81	48.0	LENNOX LGT060H4E	1200	(6) (12) (16) (18)
RTU-10	SERVICE (ERV)	12.0	480/3	4,900	10	75	3.0	81/67	203	144	36.0	292	49.00	LENNOX LGT120H4M	4300	(3) (6) (8) (10) (20)
RTU-11	SERVICE (BP)	10.3	480/3	7,000	14	13	5.0	83/70	230	193	48.0	389	47.50	LENNOX LGT300S4M	EXISTING	(15) (18)
RTU-12	SERVICE (BP)	11.6	480/3	7,000	14	12	5.0	83/70	315	202	48.0	389	47.50	LENNOX LGH300H4B	4500	(3) (6) (1) (8) (10) (15)
RTU-13	SERVICE (ERV)	12.0	480/3	4,900	10	75	3.0	81/67	203	144	36.0	292	49.00	LENNOX LGT120H4M	4300	(3) (6) (8) (10) (20)
RTU-14	SERVICE (BP)	11.6	480/3	7,000	15	11	5.0	83/70	315	202	48.0	389	47.50	LENNOX LGH300H4B	4500	(3) (6) (1) (8) (10) (15)
RTU-15	COSMETIC (BP)	12.0	480/3	5,600	13	10	5.0	84/70	246	166	48.0	389	40.00	LENNOX LGT140H4M	4000	(3) (6) (1) (8) (10) (11)
RTU-16	COSMETIC (BP)	12.0	480/3	5,600	13	10	5.0	84/70	246	166	48.0	389	40.00	LENNOX LGT140H4M	4000	(3) (6) (1) (8) (10) (11)
RTU-17	FGC	12.1	480/3	3,000	11	7	3.75	80/67	**	**	18.0	144	30.0	LENNOX LGT064H4E	1400	(12) (11)

- ONLY ACCEPTABLE MANUFACTURER IS LENNOX. SEE "ROOFTOP UNIT NOTES"
- FIELD ADJUST SUPPLY FAN RPM TO PROVIDE AIR QUANTITIES AS SCHEDULED ABOVE. INSTALL FIELD-SUPPLIED MOTOR AND/OR DRIVE AS REQ'D
- INSTALL F.A.T. DISCHARGE AIR TEMPERATURE SENSOR. SHIPPED LOOSE IN RTU CABINET, INSTALL SENSOR IN SUPPLY IN SUPPLY DUCT APPROX 3FT BELOW ROOF DECK.
- BACNET/CORE CONTROL, NEW TEMPERATURE OR COMBO T/H SENSOR.
- DRAIN FAN OVERFLOW SWITCH MODEL Z186R50A1
- HUMIDITROL & COMBO HUMIDITY/TEMPERATURE SENSOR
- NEW MIXING BOX REUSE EXISTING BYPASS CURB. NEW MIXING BOX BUSHK DUG FILE 50306633 WITH TWO INTAKE HOODS. SEE DETAIL 7M140
- FRESH AIR TEMPERING, 100% OUTSIDE AIR
- 95°F CONDENSER AIR
- MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION OF WIRING HARNESS SHIPPED LOOSE W/ RTU THAT ARE ASSOCIATED WITH OUTSIDE AIR DAMPER. THIS WILL INCLUDE CONTROL/INTERLOCK WIRING FOR ERV'S
- 5600 CFM ACROSS THE COIL, 1600 CFM BYPASSED IN THE CURB, 4000 CFM TO SUPPLY
- GLOBAL ECONOMIZER WITH BAROMETRIC RELIEF
- GLOBAL ECONOMIZER WITH POWERED EXHAUST
- 2 STAGE HEAT (EXCEPT FOR PBX RTU)
- 1000 CFM ACROSS THE COIL, 2250 CFM BYPASSED IN THE CURB, 4750 CFM TO SUPPLY
- ADAPTER CURB
- RETURN AIR ADAPTER PLATE
- PROVIDE WITH DEMAND VENTILATION, CO2 SENSOR, MODULATING OUTSIDE AIR DAMPER, OUTSIDE AIR DAMPER 5% OPEN ON A CALL FOR VENTILATION, OUTSIDE AIR DAMPER STARTS TO OPEN AT 800 PPM AND AT 1200 PPM MOVES TO 3% OPEN TO GIVE OUTSIDE AIR QUANTITY AS INDICATED IN SCHEDULE ABOVE. INSTALL CO2 SENSOR @ 48" AFF BELOW TEMPERATURE/HUMIDITY SENSOR
- IN PROGRESS TO REPLACE JANUARY 2024. EXISTING TO REMAIN
- 24" HYBRID CURB

FAN SCHEDULE

MARK	CFM	STATIC PRESS. IN UC	APPROX. FAN RPM	FAN TYPE	DAMPER	VOLT/PH	HP	MANUFACTURER / MODEL		REMARKS
								COOLING DATA	HEATING DATA	
EF-20	2850	25	**	UPBLAST	BACKDRAFT	120/1	3/4	COOK	ACRU-B 180R6B	(1) (2)
EF-21	2850	25	**	UPBLAST	BACKDRAFT	120/1	3/4	COOK	ACRU-B 180R6B	(1) (2)
EF-15	3000	25	**	UPBLAST	BACKDRAFT	120/1	3/4	COOK	ACRU-B 185R6B	(1) (3)
EF-18	3000	25	**	UPBLAST	BACKDRAFT	120/1	3/4	COOK	ACRU-B 185R6B	(1) (3)

- EXISTING TO REMAIN
- REPLACE SHEAVE F REQUIRED FOR REDUCED AIR QTY FROM 3000 CFM ORIGINAL DESIGN
- REPLACE SHEAVE F REQUIRED FOR REDUCED AIR QTY FROM 3550 CFM ORIGINAL DESIGN

ENERGY RECOVERY WHEEL SCHEDULE

MARK	SERVES	OUTSIDE AIR						(3) EXHAUST AIR			MODEL	WEIGHT	REMARKS					
		FAN		CFM	COOLING DATA			HEATING DATA										
		HP	VOLT/PH		E.A.T.	L.A.T.	TOT	SENS	E.A.T.	L.A.T.				HP	VOLT/PH	CFM		
ERV-1	RTU-13 & 10	5.0	480/3	4900	94/75	81/67	139	65	280	-8/-9	46/38	5.0	480/3	4600	LENNOX	50R6252XH	1450	(1) (2) (4)

- PROVIDE 1/4" FLASHED EQUIPMENT SUPPORT EQUAL TO FATE-E9-5. SEE IM140
- FIELD FURNISHED & INSTALLED DISCONNECT
- EXHAUST AIR TEMP AT 68°F HEAT & 75°F/63°F COOLING
- ERV BYPASS DAMPER SHALL REMAIN CLOSED. ALL AIR THROUGH WHEEL

AM CERRA, JR. PE
1827 POWERS FERRY ROAD
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22412.01



