

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 TIB CONTRACTOR AABC OR NEBB CERTIFIED. SEE TEST AND BALANCE SCOPE ON THIS SHEET.
- EXISTING SMOKE DETECTORS TO REMAIN AND BE REWIRED.
- LENNOX START UP TECH SHALL PROGRAM THE CORE BOARDS IN ALL NEW RTUS. CORE BOARDS SHALL BE PROGRAMMED PRIOR TO CSUSA 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 2021 INTERNATIONAL MECHANICAL CODE AND THE 2021 INTERNATIONAL FUEL GAS CODE WITH ALL LOCAL AMENDMENTS. ALL EQUIPMENT AND MATERIALS CAPABLE OF BEING UL LABELED OR LISTED 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" IN PRESSURE CLASS.
- NEW DUCT SHALL HAVE PAINT GRIP FINISH AND BE EITHER GALVANNEALED OR MILL PHOSPHATIZED.
- ANY NEW SUPPLY DUCT SHALL BE INTERNALLY INSULATED WITH 1" DUCT LINER EQUAL TO OWENS CORNING ACQUATITEK 15 LB DENSITY. R-3.8 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:
 - ANT DISCONNECT (INSTALLED AND WIRED)
 - BOTTOM GAS/POUER ENTRY
 - STANDARD LOW AMBIENT CONTROL
 - DUAL 120V GFI TYPE OUTLETS (TO BE FIELD WIRED)
 - GLOBAL ECONOMIZERS W/FAN POWERED EXHAUST (1ST AND LARGER UNLESS OTHERWISE NOTED)
 - GLOBAL ECONOMIZERS W/BAROMETRIC RELIEF (1ST AND SMALLER)
 - STAINLESS STEEL HEAT EXCHANGER AND FRESH AIR TEMPERING FOR BYPASS RTUS AND RTU'S THAT HAVE AN ERV
- THE LENNOX NATIONAL ACCOUNT CONTACT IS:

RON JOHNSON
704-671-7606
- 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
PH: 311-246-9381
valerie@csusa.com | comfortsysusa.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 & M MANUALS BY THE GENERAL CONTRACTOR.

- RTU AIR FILTERS SHALL BE CAPFIL FARR AEROPLEAT III (PLEATED, 3" THICK, EVERY 15, 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.

PIPING GENERAL NOTES

- ANY NEW GAS PIPING SHALL BE ASTM A-100, SCHEDULE 40, BLACK STEEL WITH 50 LB. MALLEABLE IRON SCREWED FITTINGS.
- ANY NEW EXTERIOR GAS PIPE SHALL BE PAINTED WITH RUST PROHIBITIVE PAINT.

HVAC LEGEND

A.F.F.	ABOVE FINISHED FLOOR
V.D.	VOLUME DAMPER
B.O.S.	BOTTOM OF STEEL
B.O.D.	BOTTOM OF DUCT
U.N.O.	UNLESS NOTED OTHERWISE
	VOLUME DAMPER
	SUPPLY GRILLE WITH FLEX DUCT DROP
	RETURN/EXHAUST GRILLE
R + D	R + RISE D + DROP
T	THERMOSTAT
S	LENNOX ROOM TEMPERATURE/HUMIDITY SENSOR 1" AFF
	SPIN-N FITTING
	EXISTING DUCT
	EXISTING DUCT TO BE REMOVED

(ORIGINAL BUILDING 2007)

EXISTING ROOFTOP UNIT SCHEDULE

(SHOWN FOR REFERENCE ONLY)

MARK	ZONE	EER	THERM EFF	VOLT/PH	FAN DATA				COOLING DATA			GAS DATA		MNL O/A CFM	MODEL	WEIGHT (5)	REMARKS (1)	
					CFM	TSP IN UC	ESP IN UC	HP	EAT DB/DB	TOTAL MBH	SENSIBLE MBH	INPUT MBH	OUTPUT MBH					
RTU-1	SHOOROOM	11.2	80%	480/3	3400	1.08	.8	2.0	115/64.5	107	115	130	104	400	LENNOX	LG4107H	1600	
RTU-2	SHOOROOM	11.2	80%	480/3	3400	1.08	.8	2.0	115/64.5	107	115	130	104	400	LENNOX	LG4107H	1600	
RTU-3	BUSINESS	11.3	80%	480/3	1300	.63	.6	1.5	80.9/65.9	421	37.3	78	62.4	130	LENNOX	LG4042H	900	
RTU-4	WAITING	11.3	80%	480/3	1150	.62	.6	1.5	85.1/68.2	43	32.9	78	62.4	200	LENNOX	LG4042H	900	
RTU-5	BUYERS	11.2	80%	480/3	1051	.62	.6	1.5	84.1/68	37.6	29.2	78	62.4	200	LENNOX	LG4036H	900	
RTU-6	SALES	11.2	80%	480/3	1051	.62	.6	1.5	78.1/65.6	361	26.8	78	62.4	200	LENNOX	LG4036H	900	
RTU-7	DATA/PBX	11.2	80%	480/3	960	.62	.6	1.5	74/61	34	23.3	-	-	-	LENNOX	LG4036H	900	
RTU-8	PARTS	11.3	80%	480/3	1200	.63	.6	1.5	85/61	42.8	35.8	78	62.4	160	LENNOX	LG4042H	900	
RTU-9	BREAK/TRAIN	11.0	80%	480/3	1800	.72	.6	1.5	80.4/66.1	621	47.3	78	62.4	400	LENNOX	LG4060H	900	
RTU-10	SERVICE AREA (BP)	11.0	80%	480/3	7000	1.1	.8	5.0	81.1/72.4	306.9	195.2	470	376	5800	LENNOX	LG3300H	4900	(2)
RTU-11	SERVICE AREA (BP)	11.0	80%	480/3	7000	1.1	.8	5.0	81.1/72.4	306.9	195.2	470	376	5800	LENNOX	LG3300H	4900	(2)
RTU-12	SERVICE AREA (BP)	11.0	80%	480/3	7000	1.1	.8	5.0	81.1/72.4	306.9	195.2	470	376	5800	LENNOX	LG3300H	4900	(2)
RTU-13	SERVICE AREA (BP)	11.0	80%	480/3	7000	1.1	.8	5.0	81.1/72.4	306.9	195.2	470	376	5800	LENNOX	LG3300H	4900	(2)
RTU-14	SERVICE AREA (BP)	11.0	80%	480/3	7000	1.1	.8	5.0	81.1/72.4	306.9	195.2	470	376	5800	LENNOX	LG3300H	4900	(2)
RTU-15	PAINT AREA (BP)	11.5	80%	480/3	4900	.96	.8	3.0	81.2/72.2	222.8	131	470	376	4000	LENNOX	LG4210H	4900	(2)
RTU-16	PAINT AREA (BP)	11.5	80%	480/3	4900	.96	.8	3.0	81.2/72.2	222.8	131	470	376	4000	LENNOX	LG4210H	4900	(2)
RTU-17	FOC	11.3	80%	480/3	3000	.91	.6	2.0	80/61	93.8	61.5	130	104	300	LENNOX	LG4030H	1600	

- PROVIDE WITH FACTORY INSTALLED NOVAR CONTROL MODULE. LG4 UNIT SERIES (MODEL 2051)
- BY-PASS CURB AND MIXING BOX
- INCLUDES WEIGHT OF UNIT AND CURB

ROOFTOP UNIT SCHEDULE

MARK	ZONE	EER	THERM EFF	VOLT/PH	FAN DATA				COOLING DATA (3)			GAS DATA		MNL O/A CFM	MODEL (1)	WEIGHT	REMARKS (2,4,5)	
					CFM	TSP IN UC	ESP IN UC	HP	EAT DB/DB	TOTAL MBH	SENSIBLE MBH	INPUT MBH	OUTPUT MBH					
RTU-1	SHOOROOM	12.0	80%	480/3	3400	1.3	0.8	3.15	80/61	--	--	130	104	400	LENNOX	LG10204E	1600	(6)(13)(14)(6)
RTU-2	SHOOROOM	12.0	80%	480/3	3400	1.3	0.8	3.15	80/61	--	--	130	104	400	LENNOX	LG10204E	1600	(6)(13)(14)(6)
RTU-3	BUSINESS (11.0)	80%	480/3	1300	0.8	0.6	1.0	80/61	--	--	65	53	130	LENNOX	LG10484E	1100	(6)(12)(5)	
RTU-4	WAITING (11.0)	80%	480/3	1300	0.8	0.6	1.0	80/61	--	--	65	53	200	LENNOX	LG10484E	1100	(6)(12)(5)	
RTU-5	BUYERS (11.0)	80%	480/3	1051	0.8	0.6	1.2	80/61	--	--	65	53	200	LENNOX	LG10364E	1100	(6)(12)(5)	
RTU-6	SALES (11.0)	80%	480/3	1051	0.8	0.6	1.2	80/61	--	--	65	53	200	LENNOX	LG10364E	1100	(6)(12)(5)	
RTU-7	DATA/PBX (11.0)	80%	480/3	960	0.7	0.6	1.2	80/61	--	--	-	-	-	LENNOX	LCT0364E	800	(5)(18)	
RTU-8	PARTS (11.0)	80%	480/3	1200	0.8	0.6	1.0	80/61	--	--	65	53	160	LENNOX	LG10484E	1100	(6)(12)(5)	
RTU-9	BREAK/TRAIN (11.0)	80%	480/3	1800	0.9	0.6	1.0	80/61	--	--	100	81	400	LENNOX	LG10604E	1100	(6)(11)(12)(14)(5)(15)	
RTU-10	SERVICE AREA (BP)	10.6	80%	480/3	7000	1.2	0.8	5.0	81.1/72.4	310	211	480	396	4700	LENNOX	LG4300H41	3900	(3)(6)(7)(8)(10)(11)(14)
RTU-11	SERVICE AREA (ERV)	12.0	80%	480/3	4900	1.1	0.8	3.0	80/68	181	124	360	288	4900	LENNOX	LG1204H1	4000	(3)(6)(8)(10)(11)(14)(17)
RTU-12	SERVICE AREA (BP)	10.6	80%	480/3	7000	1.2	0.8	5.0	81.1/72.4	310	211	480	396	4700	LENNOX	LG4300H41	3900	(3)(6)(7)(8)(10)(11)(14)
RTU-13	SERVICE AREA (ERV)	12.0	80%	480/3	4900	1.1	0.8	3.0	80/68	181	124	360	288	4900	LENNOX	LG1204H1	4000	(3)(6)(8)(10)(11)(14)(17)
RTU-14	SERVICE AREA (BP)	10.6	80%	480/3	7000	1.2	0.8	5.0	81.1/72.4	310	211	480	396	4700	LENNOX	LG4300H41	3900	(3)(6)(7)(8)(10)(11)(14)
RTU-15	PAINT AREA (BP)	12.0	80%	480/3	5600	1.1	0.8	5.0	81/69	218	147	480	396	3500	LENNOX	LG1240H4E	3600	(3)(6)(7)(8)(10)(11)(14)
RTU-16	PAINT AREA (BP)	12.0	80%	480/3	5600	1.1	0.8	5.0	81/69	218	147	480	396	3500	LENNOX	LG1240H4E	3600	(3)(6)(7)(8)(10)(11)(14)
RTU-17	FOC	12.0	80%	480/3	3100	1.3	0.6	3.15	80/61	--	--	180	144	300	LENNOX	LG10204E	1600	(6)(11)(14)(15)(6)

- 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 FAN DISCHARGE AIR TEMPERATURE SENSOR. SHIPPED LOOSE IN RTU CABINET. INSTALL SENSOR IN SUPPLY IN SUPPLY DUCT APPROX 3FT BELOW ROOF DECK. SEE DETAIL 11410
- BACNET CONTROL, NEW TEMP/HUM SENSOR
- DRAIN PAN OVERFLOW SWITCH MODEL Z18SR300AI
- HUMIDITROL 4 COMBO HUMIDITY/TEMPERATURE SENSOR
- NEW MIXING BOX, REUSE EXISTING BYPASS CURB
- 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

- FIELD DISABLE MS4V FEATURE. UNITS NEED TO BE CONSTANT VOLUME
- GLOBAL ECONOMIZER WITH BAROMETRIC RELIEF
- GLOBAL ECONOMIZER WITH POWERED EXHAUST
- 2 STAGE HEAT
- ADAPTER CURB
- RETURN AIR ADAPTER PLATE
- 24" HYBRID CURB
- COOLING ONLY
- PROVIDE WITH DEMAND VENTILATION CO2 SENSOR. MODULATING OUTSIDE AIR DAMPER OUTSIDE AIR DAMPER CLOSED. ON A CALL FOR VENTILATION, OUTSIDE AIR DAMPER STARTS TO OPEN AT 100 PPM AND AT 1100 PPM MOVES TO 1% OPEN TO GIVE OUTSIDE AIR QUANTITY AS INDICATED IN SCHEDULE ABOVE. INSTALL CO2 SENSOR ADJACENT TO TEMP SENSOR

ENERGY RECOVERY WHEEL SCHEDULE

MARK	SERVES	OUTSIDE AIR										MODEL	WEIGHT	REMARKS				
		FAN		CFM	COOLING DATA				HEATING DATA						(3) EXHAUST AIR			
		HP	VOLT/PH		E.A.T.	L.A.T.	TOT	SENS	SENS	E.A.T.	L.A.T.				HP	VOLT/PH	CFM	
ERV-1	RTU-11 4 13	5.0	480/3	4900	94/15	80/68	122	12	195	15/14	52/44	5.0	480/3	4900	LENNOX	50R6152H	1450	(1)(2)(4)

- PROVIDE WITH OPTIONAL EQUIPMENT SUPPORT ON FLASHED RAIL EQUAL TO FATE-ES-5.
- FIELD FURNISHED 4 INSTALLED DISCONNECT
- EXHAUST AIR TEMP AT 68°F HEAT 4 74°F/65°F COOLING
- ERV BYPASS DAMPER SHALL REMAIN CLOSED. ALL AIR THROUGH WHEEL

CONTROLS SCOPE OF WORK:	
EXISTING RTU'S ARE ON LOGIC ONE BUS. SAVVY COMMUNICATIONS TO ICM ALL RTU'S WITH ETH 2051S UO 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 311-246-9381	
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 CONTROLS TO BACNET COMMUNICATION.	
6. FOR NEW RTU'S REPLACE RTU NOVAR TEMPERATURE SENSORS WITH LENNOX SENSORS.	
7. REPLACE/UPGRADE SAVVY 31 WITH OPUS XCM105 PANEL. SAME BASE PLATE, MINIMAL RE-WIRING REQUIRED.	
8. CONNECT BACNET NETWORK AS REQUIRED.	
9. TURN OVER SAVVY 31 PANEL AND ETH15 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, 12, 4, 14	7000	4100	2300	4700	4 REGISTERS * 1175 CFM EACH	
RTU-11 4 13	4900	4900	--	4900	4 REGISTERS * 1225 CFM EACH	
ERV-1	--	4900	--	--	4900 CFM EXHAUST (RTU-11 4 13)	
RTU-15 4 16	5600	3500	2100	3500	ALL SUPPLY REGISTERS SEE 1M10	
EF-9	--	--	--	--	OUTLETS AS SHOWN SEE 1M10	
EF-15	--	--	--	--	OUTLETS AS SHOWN SEE 1M10	
EF-18 4 24	--	--	--	--	OUTLETS AS SHOWN SEE 1M10	
EF-20 4 21	--	--	--	--	OUTLETS AS SHOWN SEE 1M10	

SUGGESTED TEST & BALANCE PROCEDURE FOR BYPASS UNITS:

- RTU: 10, 12, 14
- CLOSE BYPASS DAMPER 4 MAKE AIR QTY 7000 CFM
 - GRADUALLY OPEN BYPASS DAMPER UNTIL OUTSIDE AIR IS 4100 CFM. THIS MEANS 2300 CFM IS BEING BYPASSED IN THE CURB
 - OUTSIDE AIR SHOULD EQUAL SUPPLY AIR TO THE REGISTERS

RTU: 15, 4, 16

- CLOSE BYPASS DAMPER 4 MAKE AIR QTY 5600 CFM
- GRADUALLY OPEN BYPASS DAMPER UNTIL OUTSIDE AIR IS 3500 CFM. THIS MEANS 2100 CFM IS BEING BYPASSED IN THE CURB
- OUTSIDE AIR SHOULD EQUAL SUPPLY AIR TO THE REGISTERS

TEST AND BALANCE CONTRACTOR TO NOTIFY COMFORT SYSTEMS AND

