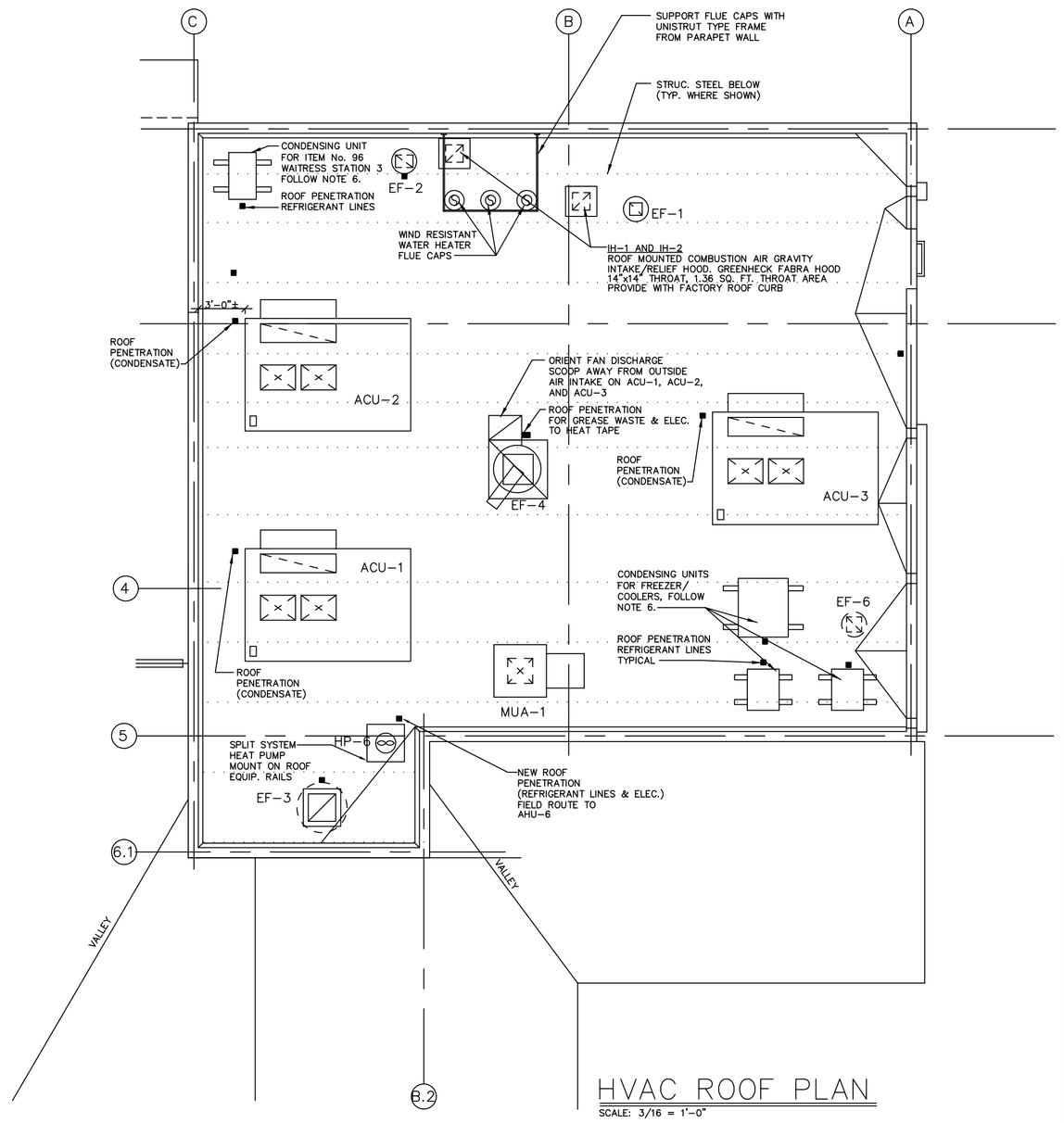
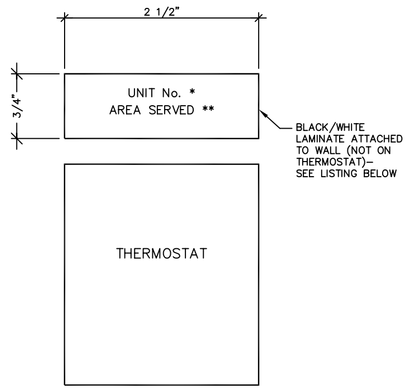


HVAC ROOF PLAN

SCALE: 3/16 = 1'-0"



THERMOSTAT MOUNTING DETAIL

NOT TO SCALE

ACU-1 FRONT MAIN DINING	ACU-2 REAR MAIN DINING	ACU-3 KITCHEN
ACU-4 FRONT PRIVATE DINING	ACU-5 REAR PRIVATE DINING	ACU-6 ENTRY/WAITING

FAN SCHEDULE

FAN IDENTIFICATION	EF-1	EF-2	EF-3 AND EF-4	EF-5	EF-6	EF-7			MUA-1
MANUFACTURER	COOK	COOK	FOLLOW VENTILATION DRAWINGS	GREENHECK	COOK	GREENHECK			FOLLOW VENTILATION DRAWINGS
MODEL NUMBER	70C15D	120R2B	REF BELOW	CSP-262	100C10D	BSQ-90-4			REF BELOW
AREA SERVED	TEAM MEMBERS RESTROOMS	DISHWASHER	KITCHEN HOODS	PUBLIC RESTROOMS	MEAT PREP	BAKERY CENTER			KITCHEN
TYPE	DIRECT DRIVE CENT. ROOFTOP	BELT DRIVE CENT. ROOF UPBLAST		CABINET FAN	BELT DRIVE CENT. ROOFTOP	BELT-DRIVE IN-LINE			
CFM	150	1,100		880	335	650			
E.S.P.	.25	0.5		.25	.25	.625			
MOTOR H.P./TYPE	96W/TEFC	1/6HP/TEFC		455W/TEFC	99W/TEFC	1/4/TEFC			
VOLTAGE	120/1/60	120/1/60		120/1/60	120/1/60	120/1/60			
WEIGHT	20 LBS.	55 LBS.		60 LBS.	30 LBS.	80 LBS.			
ACCESSORIES	① ② ⑥	① ② ③ ⑥		② ③ ⑤	① ② ③	② ④ ⑤ ⑦			

REMARKS
① ROOF CURB
② FACTORY SUPPLIED INTEGRAL ELECTRICAL DISCONNECT SWITCH
③ TO BE INTERLOCKED WITH LOCAL LIGHT CIRCUIT.
④ WITH THERMAL OVERLOAD PROTECTION ON MOTOR. WITH MOTOR COVER AND BELT GUARD
⑤ PROVIDE WITH FACTORY HANGING VIBRATION ISOLATOR KIT.
⑥ INTERLOCKED WITH KITCHEN LIGHTING – SEE EF-3.
⑦ CONTROL BY LOCAL SWITCH.

SYSTEM CONTROLS AND SEQUENCE OF OPERATION.

ACU-1
ACU-2
ACU-3

HP-4/AHU-4
HP-5/AHU-5
HP-6/AHU-6

FURNISH AND INSTALL THE HVAC CONTROL SYSTEMS AS DESCRIBED INCLUDING, BUT NOT LIMITED TO, ALL WIRING, CONTROLLERS, COMPONENTS AND APPURTENANCES REQUIRED FOR FULLY OPERABLE AND FUNCTIONAL SYSTEMS. THE CONTROL SYSTEM(S) SHALL BE PROVIDED BY LENNOX UNDER NATIONAL ACCOUNT. SEE NOTE 5.

PACKAGED ROOFTOP UNITS AND SPLIT SYSTEM HEAT PUMPS SHALL BE CONTROLLED BY 7 DAY PROGRAMMABLE THERMOSTATS/CONTROLLERS TO PROVIDE OCCUPIED AND UNOCCUPIED SCHEDULING. IN OCCUPIED MODE OF OPERATION, THE HEAT PUMP AND PACKAGED UNITS SHALL OPERATE TO MAINTAIN THE TEMPERATURE SET POINT (SUMMER/WINTER ADJUSTABLE) AS INDICATED ON SHEET M-1 BASED ON WALL OR DUCT MOUNTED REMOTE TEMPERATURE SENSORS AS INDICATED FOR EACH UNIT. PACKAGED UNITS ACU-1 AND ACU-2 SHALL BE CONTROLLED WITH MULTIPLE REMOTE SENSORS FOR TEMPERATURE AVERAGING AS INDICATED.

THE CONTROL SYSTEM SHALL PROVIDE AUTOMATIC CHANGEOVER FROM COOLING TO HEATING. IN THE HEATING MODE, THE HEAT PUMP SYSTEMS SHALL BE CONTROLLED TO PREVENT SUPPLEMENTAL HEATER OPERATION IF THE HEAT PUMP CAN MEET THE BUILDING HEAT LOAD. SEE SPECIAL HEAT PUMP CONTROL NOTE BELOW.
THE CONTROL SYSTEM SHALL HAVE A MOMENTARY OVERRIDE BUTTON FOR EACH SYSTEM TO OVERRIDE THE UNOCCUPIED MODE FOR SELECTABLE ONE OR TWO HOUR INTERVALS.

INDOOR UNITS AHU-4, AHU-5 AND AHU-6 AND ROOFTOP UNITS ACU-1 AND ACU-2 SHALL HAVE 2-POSITION AUTOMATIC DAMPERS AS INDICATED
THE OUTSIDE AIR MANUAL DAMPERS (AHU-4, AHU-5 AND AHU-6) SHALL BE SET TO PROVIDE AIR FLOWS AS SCHEDULED WITH THE 2-POSITION MOTORIZED DAMPER FULLY OPENED.
IN THE OCCUPIED MODE, THE MOTORIZED OUTSIDE AIR DAMPERS SHALL BE ENERGIZED TO THE OPEN POSITION AND THE INDOOR FAN SHALL BE SET TO RUN CONTINUOUSLY.

IN THE UNOCCUPIED SCHEDULE, THE MOTORIZED OUTSIDE AIR DAMPER SHALL BE FULLY CLOSED
THE OUTDOOR UNIT AND INDOOR FAN SHALL CYCLE TO MAINTAIN THE TEMPERATURE SETPOINTS (80 DEG. SUMMER/65 DEG. WINTER ADJUSTABLE). THE AIR SYSTEM SHALL BE 100% RECIRCULATION. A WARM-UP AND COOL DOWN CYCLE SHALL BE PROGRAMMED TO BRING THE SPACE TEMPERATURE TO OCCUPIED SETPOINTS ONE HOUR PRIOR TO OCCUPANCY TIME (ADJUSTABLE)

IN THE WARM-UP / COOL DOWN CYCLE, THE MOTORIZED OUTSIDE AIR DAMPERS SHALL BE FULLY CLOSED.

IF THE HEAT PUMP SYSTEMS ARE UNABLE TO MEET THE BUILDING HEAT LOAD, THE THERMOSTAT/CONTROLLER SHALL ENERGIZE THE SUPPLEMENTAL ELECTRIC HEAT AS REQUIRED TO SATISFY LOAD DEMANDS. THE SYSTEM SHALL HAVE AN EMERGENCY OVERRIDE TO BY-PASS THE COMPRESSOR CIRCUIT AND ENERGIZE THE ELECTRIC HEAT IN THE EVENT OF HEAT PUMP SYSTEM FAILURE IN HEATING CYCLE.

* SPECIAL HEAT PUMP UNIT CONTROLS

THE CONTROL SYSTEM SHALL PROVIDE HEAT PUMP SYSTEM CONTROL FOR EACH HEAT PUMP UNIT TO SENSE IF THE HEAT PUMPS ARE RAISING THE SPACE TEMPERATURE AT A SUFFICIENT RATE DURING THE WARM-UP CYCLE OR MAINTAINING THE SPACE TEMPERATURE DURING THE "OCCUPIED" MODE AND ONLY AND ENERGIZE THE SUPPLEMENTAL HEAT ONLY AS REQUIRED.

THIS CONTROL SEQUENCE MAY BE ACCOMPLISHED BY USE OF THE OUTSIDE AIR SENSOR WIRED IN SERIES WITH THE SECOND HEATING STAGE THAT WILL ALLOW THE SUPPLEMENTAL HEAT TO BE ENERGIZED ONLY IF THE SECOND HEATING STAGE IS REQUIRED AND THE OUTDOOR AIR TEMPERATURE IS 40 DEGREES F. OR LESS (ADJUSTABLE).

IN ADDITION, THE CONTROL SYSTEM SHALL ALLOW BY-PASS OF THE HEAT PUMP COMPRESSOR CIRCUIT TO BRING ON THE ELECTRIC HEAT FOR EMERGENCY HEAT IF REQUIRED.

THE CONTROL SYSTEM SHALL BE CAPABLE OF MANUALLY SETTING THE INDOOR FAN FOR CONTINUOUS OR CYCLE OPERATION.

DUCT SMOKE DETECTORS SHALL BE PROVIDED AS INDICATED TO AUTOMATICALLY SHUT THE HEAT PUMP SYSTEM INDOOR UNIT DOWN IN THE EVENT SMOKE IS DETECTED INSIDE THE DUCT. DUCT DETECTORS TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR. DUCT DETECTORS, MOUNTING AND CONTROL WIRING FOR UNIT SHUT DOWN TO BE PROVIDED BY THE MECHANICAL CONTRACTOR.

KITCHEN HOOD VENTILATION SCHEDULE

	EXHAUST SYSTEM		MAKE-UP AIR SYSTEM
	HOOD #1 (EF-4) BROILERS/OVEN/FRYER	HOOD #2 (EF-3) FRYERS/OVENS/STEAMER	MUA-1 HOODS #1 & #2
FAN MFGR./MODEL NO.	SUPREME/GBD 245 H	LOREN COOK 180-VBB	DELHI/SIS 20
FAN HP/SP H_2O	5 / 1.5	1.5 / 1.25	5.0/1.0
ELEC. VOLTAGE	208/3/60	208/3/60	208/3/60
FAN MOTOR RPM	1725	---	1763
FAN RPM	1150	1310	608
EXH. CFM	6200	3611	-0-
EXH. DUCT SIZE	24" x 24"	22" x 22"	--
STACK FPM	--	--	--
MUA CFM			7758
HOOD SIZE(S)	(1) 190 3/8" x 54"	(1) 178 3/8" x 54"	--
SUPPLIER	GEN III, INC.	GEN III, INC.	GEN III, INC.
APPROVALS	UL LISTED	UL LISTED	UL LISTED
	NSF/NFPA 96	NSF/NFPA 96	NSF/NFPA 96

REMARKS
NOTE 1 – FOLLOW GEN III, INC. VENTILATION DRAWINGS FOR MORE DETAIL.
NOTE 2 – EF-3 AND EF-4 TO BE UL 762 LISTED FOR GREASE DUTY.
EF-3, EF-4, AND MUA-1 TO BE FURNISHED WITH DISCONNECTS & ROOF CURBS.
EF-3 AND EF-4 TO BE FURNISHED WITH HEAT TAPE ON DISCHARGE DRAIN LINES (FIELD INSTALLED BY ELECTRICIAN)
HOODS 1 & 2 TO BE FACTORY PRE-PIPED FOR FIRE SUPPRESSION WITH REMOTE TANKS. REFER TO HOOD SYSTEM VENTILATION DRAWINGS FOR DETAILS.
EF-3, EF-4, AND MUA-1 CONTROLS FURNISHED BY GEN III, INC. WITH HOOD PACKAGE, MOUNTED AND WIRED BY ELECTRICIAN.
HOOD 1 AND 2 HAVE SWITCH PANELS.
NOTE 3 – THIS TABLE IS FOR INFORMATIONAL PURPOSES ONLY, OWNER'S EQUIPMENT VENDOR SUPPLIES MECHANICAL EQUIPMENT RELATED TO HOOD VENTILATION SYSTEM.
NOTE 4 – L.C. SYSTEMS IS THE HOO MANUFACTURER

SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE

NO	MAKE AND MODEL NO	SUPPLY CFM	OA CFM	ESP IWG	FAN MOTOR HP	FAN MOTOR POWER	EMERGENCY/ SUPPLEMENTAL HEATING MODEL NO	EMERGENCY/ SUPPLEMENTAL HEATING POWER	COOLING DX COIL	WT #	COMMENTS
AHU-4	LENNOX CB30M-65	1600 (4 TON)	330	0.5	1/2	208-1-60	15KW-3 STAGES ECB29-15CB	208-3-60	YES	250	T.A. FILTERS AT R.A. GRILLES
AHU-5	LENNOX CB30M-65	1600 (4 TON)	330	0.5	1/2	208-1-60	15KW-3 STAGES ECB29-15CB	208-3-60	YES	250	T.A. FILTERS AT R.A. GRILLES
AHU-6	LENNOX CB30M-65	1960 (5 TON)	400	0.3	1/2	208-1-60	15KW-3 STAGES ECB29-15CB	208-3-60	YES	250	T.A. FILTERS AT R.A. GRILLES

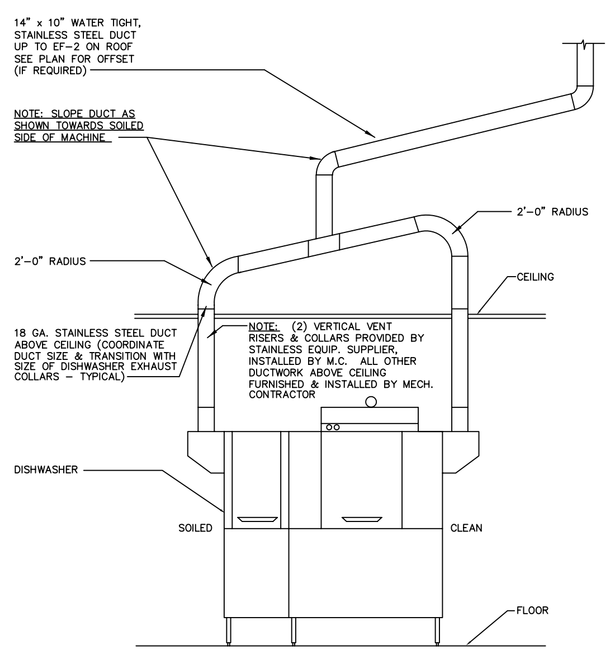
SPLIT SYSTEM HEAT PUMP UNIT SCHEDULE

NO	MAKE AND MODEL NO	COOLING ENT AIR DB	ENT AIR WB	COND	MBH SH	MBH TH	SEER	HEATING- HIGH TEMP. RATING (ARI 210/240) MBH	HSPF	COP	ELECTRICAL COMP RLA	COMP POWER	OD FAN FLA	OD FAN POWER	WT #	COMMENTS
HP-4	LENNOX HP29-513	80	67	95	40.0	47.0	10.5	40.0	7.10	3.10	14.0	208-3-60	1.9	208-1-60	375	WITH LOW AMBIENT CONTROL
HP-5	LENNOX HP29-513	80	67	95	40.0	47.0	10.5	40.0	7.10	3.10	14.0	208-3-60	1.9	208-1-60	375	WITH LOW AMBIENT CONTROL
HP-6	LENNOX HP29-653	80	67	95	44.0	58.0	10.6	54.0	7.10	3.0	17.3	208-3-60	1.9	208-1-60	375	WITH LOW AMBIENT CONTROL

ROOFTOP GAS-FIRED H.V.A.C. UNIT SCHEDULE

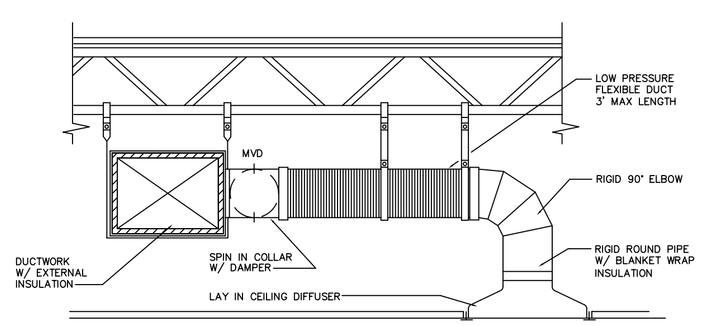
	ACU-1	ACU-2	ACU-3
MANUFACTURER	LENNOX	LENNOX	LENNOX
MODEL NO.	LGA 180S-260Y	LGA 180S-260Y	LGA 180S-260Y
VOLTAGE	208/3/60	208/3/60	208/3/60
COMP: LRA/RLA	3-110.0 EA /16.7 EA	3-110.0 / 16.7 EA.	3-110.0 EA /16.7 EA
COND. FAN: FLA	9.6	9.6	9.6
CAPACITY THC/SHC	180,920/137,000	180,920/137,000	180,920/137,000
FAN SECTION:			
CFM SUPPLY	6,000(15 TON)	6,000(15 TON)	6,000(15 TON)
CFM O.A.	1760	1500	1500
FAN H.P./VOLTAGE	5/208/3	5/208/3	5/208/3
ESP – IN WG.	1.5	1.5	1.5
HEATING SECTION:			
FUEL	NATURAL GAS	NATURAL GAS	NATURAL GAS
MBH INPUT/OUTPUT	260/208	260/208	260/208
FILTER	(6)24x24x2	(6)24x24x2	(6)24x24x2
OPERATING WT.-LBS.	2,470 EACH	2,470 EACH	2,470 EACH
ACCESSORIES	⑦②③④⑤⑥	⑦②③④⑤⑥	①②③④⑤⑥

REMARKS
① OUTSIDE AIR HOOD WITH MANUAL DAMPER. SET FOR OUTSIDE AIR VOLUME AS SHEDULED
② REFRIGERANT PRESSURE CUT-OUTS: HIGH PRESSURE – MANUAL RESET; LOW PRESSURE – AUTOMATIC RESET.
③ INTERMITTENT ELECTRONIC PILOT IGNITION
④ SEE SECTION 15901 IN SPECIFICATION
⑤ PROVIDE BOTTOM POWER ENTRY KIT
⑥ PROVIDE WITH FACTORY SECURITY BARS FOR INSTALLATION IN SUPPLY & RETURN DUCT OPENINGS.
⑦ OUTSIDE AIR HOOD WITH MOTORIZED DAMPER.



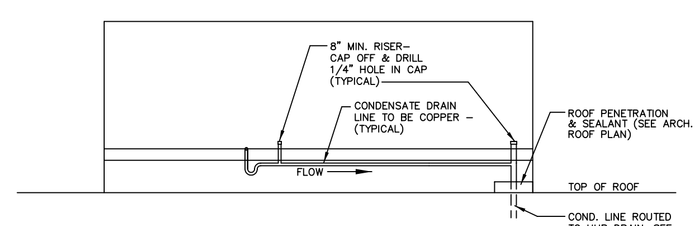
DISHWASHER EXHAUST DUCT DETAIL

NOT TO SCALE



DUCT CONNECTIONS TO CEILING DIFFUSERS DETAIL

NOT TO SCALE



H.V.A.C. CONDENSATE DRAIN LINE DETAIL

NOT TO SCALE

NOTE:
DETAIL SHOWS CONDITION @ ROOF TOP UNITS.
P-TRAP AND RISER WITH HOLE IN CAP IS ALSO REQUIRED AT AIR HANDLING UNITS ON MECHANICAL PLATFORM ABOVE RESTROOMS AND CASHIER AREA CEILING

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GENERAL NOTES:

1. CONDENSATE DRAIN LINES ARE TO TERMINATE BELOW ROOF. THE PLUMBING CONTRACTOR TO PICK-UP CONDENSATE DRAIN LINE AT THIS POINT.
2. FOLLOW SHEET P-1 FOR VENT LOCATIONS.
3. FOLLOW SHEET A-3 FOR ROOF CURB, RAIL & PITCH PAN DETAILS. CONTRACTOR SHALL FURNISH ALL ROOF PENETRATIONS REQUIRED FOR MECHANICAL EQUIPMENT.
4. MUA-1, EF-3, & EF-4, WITH PRE-FAB EQUIPMENT CURBS, ARE FURNISHED BY OWNER'S EQUIPMENT VENDOR. MUA-1, EF-3, EF-4, PRE-FAB EQUIP. CURBS, & ASSOCIATED DUCT WORK ARE INSTALLED BY G.C. (MECHANICAL AND/OR ROOFING CONTRACTOR). ELECTRICAL CONTRACTOR SHALL FURNISH ALL ITEMS FOR CONNECTIONS AND SHALL MAKE ALL FIELD CONNECTIONS TO THE EQUIPMENT.
5. RYAN'S FAMILY STEAK HOUSE, INC. HAS A NATIONAL ACCOUNT WITH LENNOX INDUSTRIES. FOR INFORMATION REGARDING SUPPLY OF EQUIPMENT, THERMOSTAT CONTROLS, PRICING, AND AVAILABILITY, PLEASE CONTACT:
   LENNOX NATIONAL ACCOUNT
   MIKE C. HAMPTON
   PEACHTREE CITY, GA.
   (770) 719-3398
6. REMOTE CONDENSER UNITS FOR ITEM #96 AND CONDENSER UNITS (3) FOR FREEZER/COOLER UNITS ARE SUPPLIED BY AND INSTALLED BY OWNER'S EQUIPMENT VENDOR. MECHANICAL CONTRACTOR TO PROVIDE EQUIPMENT SUPPORT RAILS. UNITS SHALL BE PLACED ON ROOF BY MECHANICAL CONTRACTOR AT THE SAME TIME AS ROOFTOP A/C UNITS ARE SET.
7. SECURITY BARS TO BE INSTALLED IN SUPPLY AND RETURN DUCT DROPS AT EQUIPMENT MOUNTING FRAME SUPPLY AND RETURN OPENINGS, AND ALL ROOF OPENINGS GREATER THAN 8". BARS ARE ATTACHED TO SIDE OF FRAME AFTER DUCT DROP IN INSTALLED. (REF. 13/S-6).
8. ROOFTOP UNITS AC-1, AC-2 AND AC-3 TO BE PROVIDED WITH FACTORY ACCESSORIES AS FOLLOWS:
   – ROOF CURBS
   – NON-FUSED TYPE DISCONNECTS
   – 15 AMP GFCI – FIELD WIRED
   *** – 2-STAGE HEATING AND COOLING THERMOSTATS * WITH RANGE OF NO LESS THAN 55-85°F WITH DEAD BAND CAPABILITY OF NO LESS THAN 5°F, THERMOSTAT SHALL BE CAPABLE OF AUTOMATIC SET BACK DURING THE UNOCCUPIED TIME MODE, THE COOLING AND HEATING SETPOINT TEMPERATURES SHALL BE 80°F AND 60°F RESPECTIVELY.
   – REMOTE TEMPERATURE SENSORS(AND DUCT PROBE FOR ACU-3)
   – FIRESTATS IN RETURN DUCT (SBCCI ONLY)
   **– SMOKE DETECTOR AND SAMPLE TUBES IN SUPPLY DUCT
   *** FURNISH AND INSTALL A TEMPERATURE CONTROL AVERAGING SYSTEM FOR ACU-1 AND ACU-2 SERVING THE DINING AREAS. THE SYSTEM SHALL CONSIST OF THE FOLLOWING LENNOX DEVICES FOR EACH SYSTEM;
   – WALL MOUNT THERMOSTAT (MODEL DSL-700)
   – (2) REMOTE INDOOR SENSORS (MODEL LX-605), ONE WALL MOUNT AND ONE COLUMN MOUNT

   THE SPACE CONDITIONS SHALL BE CONTROLLED TO MAINTAIN THE TEMPERATURE SET POINT BY TAKING THE AVERAGE OF THE TEMPERATURES SENSED BY THE REMOTE WALL SENSOR. THE REMOTE WALL SENSOR SHALL BE LOCATED AS INDICATED ON THE PLAN DRAWING. THE CONTROL COMPONENTS SHALL BE PROVIDED BY LENNOX, INC. AND INSTALLED IN STRICT CONFORMANCE WITH THE WRITTEN INSTRUCTIONS AND RECOMMENDATIONS OF THE MANUFACTURER.
9. SPLIT SYSTEM HEAT PUMP UNITS HP-4/AHU-4 AND HP-5/AHU-5 TO BE PROVIDED WITH FACTORY ACCESSORIES AS FOLLOWS:
   – LOW AMBIENT KIT – FIELD INSTALLED
   – THERMOSTAT WITH 2-STAGE HEATING *
   – REMOTE TEMPERATURE SENSOR
   – FIRESTAT IN RETURN DUCT – (SBCCI ONLY)
   **– SMOKE DETECTOR AND SAMPLE TUBES IN SUPPLY DUCT

   * THERMOSTAT KIT TO INCLUDE SHIELDED CABLE (BELDING No. 87-40)

   ** SMOKE DECTECTORS AND SAMPLE TUBES IN SUPPLY AND RETURN DUCTS IN U.B.C. AND B.O.C.A. JURISDICTIONS
10. PROVIDE LABELING ABOVE EACH THERMOSTAT AS INDICATED. THE LABELING INSCRIPTION SHALL BE AS FOLLOWS:
   – ACU-1: FRONT MAIN DINING
   – ACU-2: REAR MAIN DINING
   – ACU-3: KITCHEN
   – ACU-4: FRONT PRIVATE DINING
   – ACU-5: REAR PRIVATE DINING
   – ACU-6: ENTRY/WAITING

REVISIONS

REV.	DESCRIPTION	DATE	BY
A			W.A.R.

RYAN'S FAMILY STEAK HOUSES, INC.
199 HUNT STREET · GREER, S.C. 29650 · (864) 879-1000

Ryan's® FAMILY STEAK HOUSE

HVAC ROOF PLAN & SCHEDULES

DESIGNED: R.A.D. | DATE: 08-12-99

STORE TYPE: PT9L | DRAWING NO.: M-2