

WHITE PAPER

7 ELEVEN

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OVERVIEW OF CHALLENGE IN THE PROJECT

7-Eleven was planning to open a large retail store at Ronkonkoma, NY. The area of the retail store was 3,043 Sq. Ft. with large open space and multiple cold storage facilities inside the building.

Client was looking for a low cost MEP design for this new construction retail store that will also match the standards of 7-Eleven franchise.

We faced 3 main challenges while designing this project-

- Match the standards of franchise and design as per the NY state codes
- Utilize the limited roof space available (building had sloped roof) to place HVAC units
- Keep the cost of design under control specially power as the building had multiple cold storage

YOUR ONE STOP
SHOP FOR ALL
MEP DESIGN
NEEDS

DESIGNED &
CONCEPTUALIZED BY
NY-ENGINEERS

OUR CUSTOM SOLUTION

Our team of experts calculated the HVAC load, measured the roof space availability to design and place HVAC units to overcome the roof space availability crunch.

To reduce the construction cost, we suggested central air conditioning which will reduce the utility cost and can help to place outdoor unit in a minimum space on the roof.

For plumbing, we designed the drainage system of retail unit by coordinating multiple cold storage locations to minimize the piping cost. We designed electrical system by considering local and IBC codes to reduce the cost for the client.

By successfully designing this complicated project, we managed to utilize limited roof space, reduce the piping work and saved the cost for an owner. The entire franchise was designed within 2 weeks in an affordable cost.

Area - 3,043 Sq. Ft.

Services Used - Mechanical,
Electrical, Plumbing

ROOFTOP UNIT SCHEDULE																
MARK	MANUFACTURER	MODEL	NOMINAL TONS	SUPPLY FAN			COOLING CAPACITY @ 95°F (MBH)		IEER/IEER	HEATING CAPACITY			ELECTRICAL DATA			WEIGHT (LBS)
				CFM	E.S.P. (IN. WC)	OSA (CFM)	TOTAL	SENSIBLE		GAS INPUT / OUTPUT (MBH)	SUPPLY TEMP °F	THERMAL EFF.	V/PH	MCA(A)	MOCP (A)	
RTU-1	CARRIER	48HC-D08	7.5	3000	0.6"	260	93.3	72.2	13.8/12.00	125/103	75.0/94.1	82%	208/3	41	50	1251
RTU-2	CARRIER	48HC-D08	7.5	3000	0.6"	260	93.3	72.2	13.8/12.00	125/103	75.0/94.1	82%	208/3	41	50	1251

NOTES (ALL NEW UNITS):
A. PROVIDE FILTER WITH EACH UNIT.
B. PROVIDE WITH FULLY MODULATING ECONOMIZER WITH ENTHALPY CONTROL.
C. SMOKE DETECTORS TO BE PROVIDED AND INSTALLED BY CARRIER. LOCATE AS SHOWN ON PLAN.
D. CONDENSATE TRAP SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR. PROVIDE TRAP OF ADEQUATE DEPTH TO PREVENT STATIC FROM OVERCOMING TRAP SEAL. ROUTE TO NEAREST APPROVED RECEPTOR.
E. PROVIDE WITH STANDARD ROOF CURB AND ACCESSORIES.
F. OUTDOOR AMBIENT DESIGN TEMPERATURE 95 DEG.F.
G. SET FAN OPERATION TO CONTINUOUS.
H. TEMPERATURE SET POINTS DURING OCCUPIED HOURS: HEATING MODE: 66°F - COOLING MODE: 75°F.
I. PROVIDED BY 7-ELEVEN AND INSTALLED BY CONTRACTOR. FOR ADDITIONAL INFORMATION CONTACT NATIONAL ACCOUNT REPRESENTATIVE BOBBY KIMBRELL (512) 267-3366, BOBBY.KIMBRELL@CARRIER.UTC.COM.
J. CONTACT AUTOMATED LOGIC (ALC) AT (866) 390-4275 FOR BUILDING ENERGY MANAGEMENT SYSTEM.
K. PROVIDE WITH I/O FLEX CONTROL MODULE.
L. PROVIDE WITH CONDENSER COIL HAIL GUARD (LOUVERED DESIGN).
M. PROVIDE WITH PRE-COATED OUTDOOR COILS WITHIN A 5 MILE RADIUS OF ANY SALT OR BRACKISH WATER.
N. IF HOT GAS BYPASS IS PROVIDED IT SHOULD BE LIMITED TO <=240 MBH AT 50% AND >240 MBH AT 25%.

EXHAUST FAN SCHEDULE								
MARK	QUANTITY	MANUFACTURER	MODEL	CFM	E.S.P. (IN. WC)	V/PH	WATTS	CONTROL
EF-1	2	GREENHECK	SP-B150	100	0.25"	120/1	129	LIGHT SWITCH

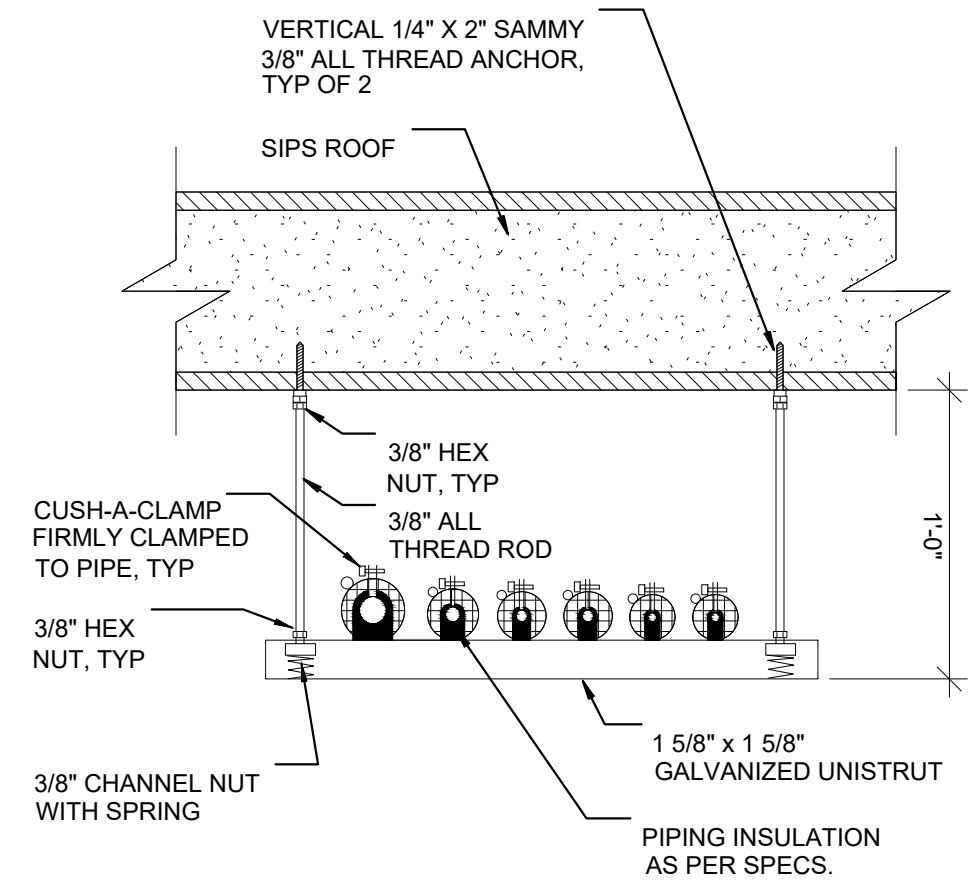
NOTES:
A. PROVIDE GRAVITY BACKDRAFT DAMPER.
B. PROVIDE SPRING VIBRATION ISOLATORS FOR HANGER ROD SUPPORTS.
C. TO BE PROVIDED BY 7-ELEVEN AND INSTALLED BY CONTRACTOR. FOR ADDITIONAL INFORMATION CONTACT CHAD LITERKSY (214) 350-6871 EXT. 2140 WITH BARTOS INDUSTRIES.

OSA CALCULATIONS					
CLASSIFICATION	AREA FT2 (Az)	CFM PER AREA FT2 (Ra)	PEOPLE PERSONS (Pz)	CFM PER PERSON (Rp)	ZONE EFFECTIVENESS (Ez)
SUPERMARKET	2434	0.06	35	7.5	0.8
$V_{bz} = R_p P_z + R_a A_z$ $7.5 \times 35 + 0.06 \times 2434 = 409$					$V_{oz} = V_{bz} / E_z$ $409 / 0.8 = 512$
TOTAL REQUIRED:					512
TOTAL SUPPLIED:					520

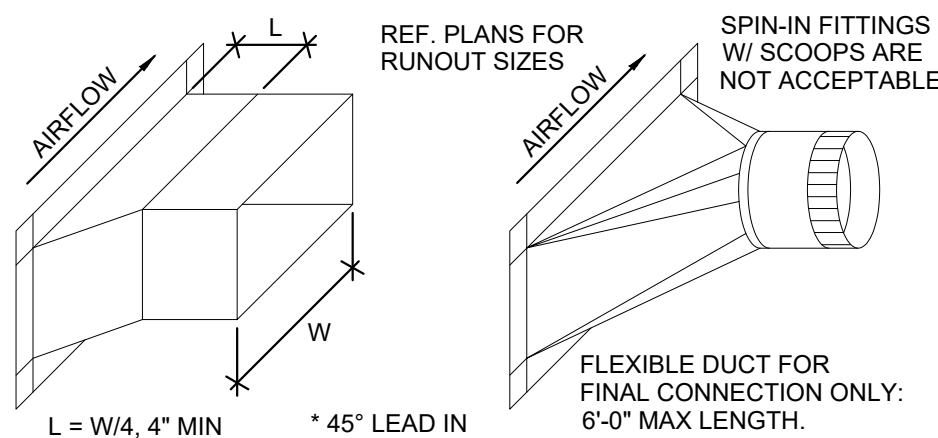
BEACON II AND EVAPORATORS TO BE CONFIGURED FOR THE INCOMING VOLTAGE.

ROUTE INSIDE REFRIGERANT LINES TIGHT TO EXTERIOR WALL. REF 3/M1.0 FOR SUPPORT DETAIL.

AIR BALANCE SCHEDULE		
MARK	OUTSIDE AIR CFM	EXHAUST AIR CFM
RTU-1	260	-
RTU-2	260	-
EF-1 (#2)	-	200
TOTAL	520	200



3 REFRIGERANT LINE SUPPORT
N.T.S.



2 BRANCH DUCT FITTING
N.T.S.

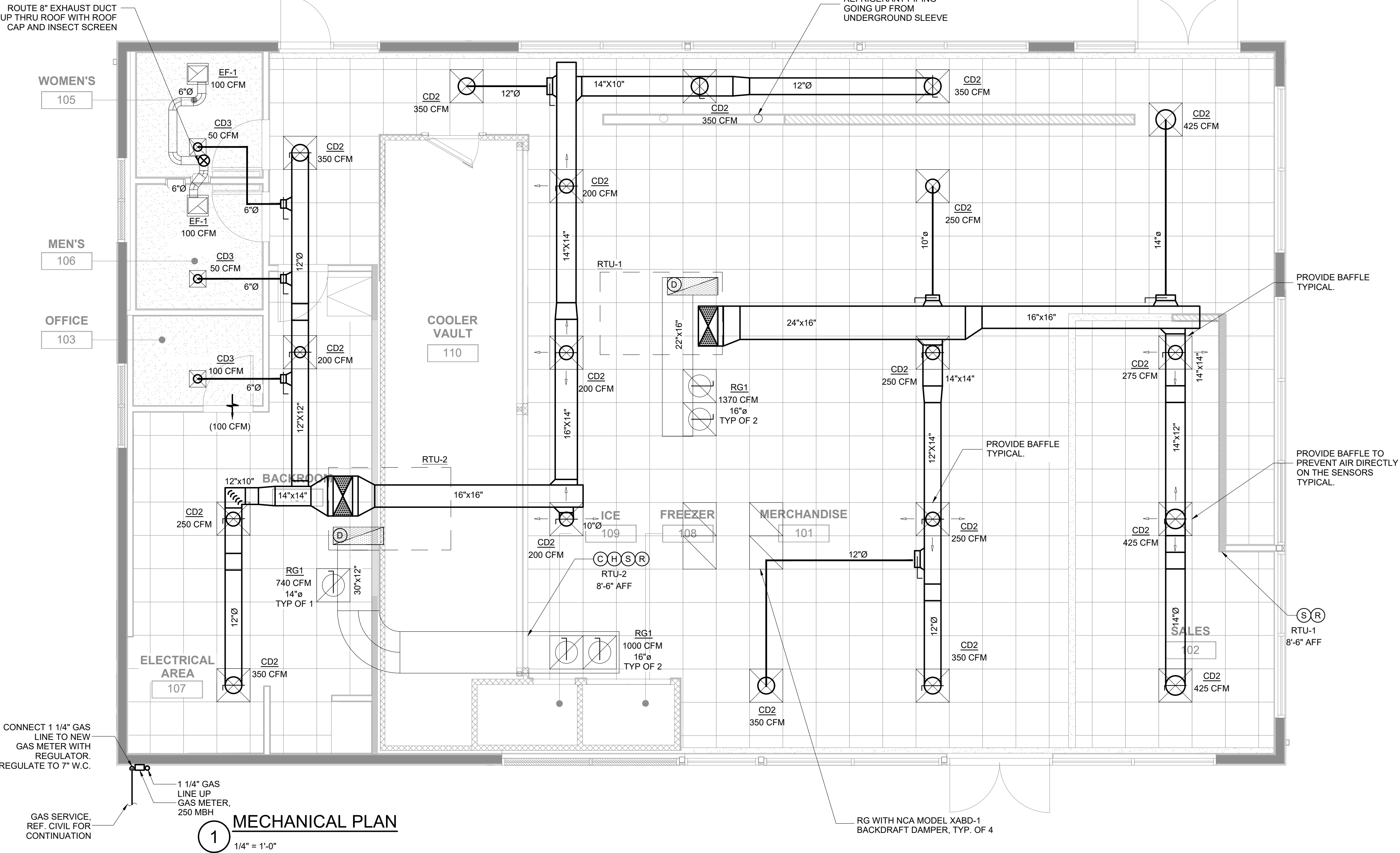
AIR DEVICE SCHEDULE								
MARK	SERVICE	MANUFACTURER	MODEL	STYLE	FACE SIZE	NECK SIZE	FRAME TYPE	NOTES
CD1	SUPPLY	METAL-AIRE	V4004D-1	ALUMINUM DOUBLE DEFLECTION WALL SUPPLY GRILLE	20 X 10	18 X 8	SURFACE	A, B, C, D
CD2	SUPPLY	METAL-AIRE	5700-6 AL	ROUND NECK CEILING DIFFUSER	24 X 24	PER PLAN	LAY-IN	A, B, C, D
CD3	SUPPLY	METAL-AIRE	5700-1 AL	ROUND NECK CEILING DIFFUSER	12 X 12	PER PLAN	SURFACE	A, B, C, D
CD4	SUPPLY	METAL-AIRE	V4004D-1	ALUMINUM DOUBLE DEFLECTION WALL SUPPLY GRILLE	14 X 8	12 X 6	SURFACE	A, B, C, D
RG1	RETURN	METAL-AIRE	CC5-6	EGGCRATE CEILING RETURN GRILLE	24 X 24	22 X 22	LAY-IN	A, B, C, D
RG2	RETURN	METAL-AIRE	RH-1	SIDEWALL RETURN GRILLE	32 X 18	30 X 16	SURFACE	A, C, D

GENERAL INFORMATION (ALL DEVICES):
1. ALL DIFFUSERS ARE 4-WAY THROW UNLESS NOTED OTHERWISE.
2. ALL AIR DEVICES SHALL BE PROVIDED BY 7-ELEVEN AND INSTALLED BY THE CONTRACTOR. FOR ADDITIONAL INFORMATION CONTACT CHAD LITERKSY (214) 350-6871 EXT. 2140 WITH BARTOS INDUSTRIES.
3. PROVIDE BAFFLES TO THE DIFFUSERS AS SHOWN ON THE PLAN.

NOTES:
A. DIFFUSER NECK SIZE SHALL BE SAME AS BRANCH DUCT SIZE UNLESS NOTED OTHERWISE.
B. DAMPER AT TAKEOFF TO DEVICE.
C. STANDARD OFF-WHITE FINISH.
D. PROVIDE NECK FOR DUCT CONNECTION.

GRAVITY VENT SCHEDULE								
MARK	QUANTITY	MANUFACTURER	MODEL	SIZE	THROAT AREA	CFM	E.S.P. (IN. WC)	VELOCITY (FPM)
GV-1	1	GREENHECK	GRSR	42" DIA	9.77 SQ. FT.	6000	0.07"	600

NOTES:
A. PROVIDE WITH ROOF CURB, BAROMETRIC RELIEF DAMPER AND BIRD SCREEN.
B. VENT SHALL BE PROVIDED WITH PROTECTIVE COATING
C. FOR ADDITIONAL INFORMATION CONTACT CHD LITERKSY (214) 350-6871 EXT. 2140 WITH BARTOS INDUSTRIES.



1 MECHANICAL PLAN
1/4" = 1'-0"

HVAC NOTES

- NOTES APPLY TO ALL MECHANICAL SHEETS.
- EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
- PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS.
- SPRINKLER HEAD AND LIGHTING FIXTURE LOCATIONS TAKE PRECEDENCE OVER DIFFUSER LOCATIONS. COORDINATE WITH ELECTRICAL CONTRACTOR AND FIRE PROTECTION CONTRACTOR.
- DUCTWORK IDENTIFICATION AND INSTALLATION TO ADHERE TO GOVERNING CODES.
- DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS AND REPRESENTATIVE OF THE INSIDE EQUIVALENT FREE AREA REQUIRED TO MAINTAIN THE AIR FLOW SPECIFIED. IF DUCT LINING IS REQUIRED, INCREASE DUCT SIZE TO MAINTAIN ORIGINAL INSIDE DIMENSIONS. IF DUCT SIZES NEED TO BE ALTERED FOR SPACE REQUIREMENTS, ENSURE THE ORIGINAL INSIDE DUCT EQUIVALENT FREE AREA IS MAINTAINED.
- TYPICAL BRANCH DUCT FITTING DETAIL IS APPLICABLE THROUGHOUT. FLEXIBLE DUCTWORK IS ONLY PERMITTED FOR FINAL CONNECTION - MAX LENGTH OF 6'-0".
- FURNISH AND INSTALL VOLUME/BALANCE DAMPERS AT ALL BRANCH DUCTS TO DIFFUSERS. LOCATE DAMPERS A MINIMUM 4'-0" AWAY FROM DIFFUSERS. PROVIDE ACCESS AS REQUIRED.
- ALL CEILING DIFFUSERS ARE 4-WAY PATTERN UNLESS SHOWN OTHERWISE.
- PROVIDE A COMPLETE TEST AND BALANCE FOR HVAC SYSTEM. AIR BALANCE SHALL BE WITHIN 5% OF SCHEDULED AIRFLOWS. PROVIDE A COPY TO THE OWNER AND ENGINEER.
- INSTALL VTR'S AND EXHAUST FANS A MINIMUM OF 10 FT FROM OUTSIDE AIR INTAKE.

MECHANICAL SYMBOLS

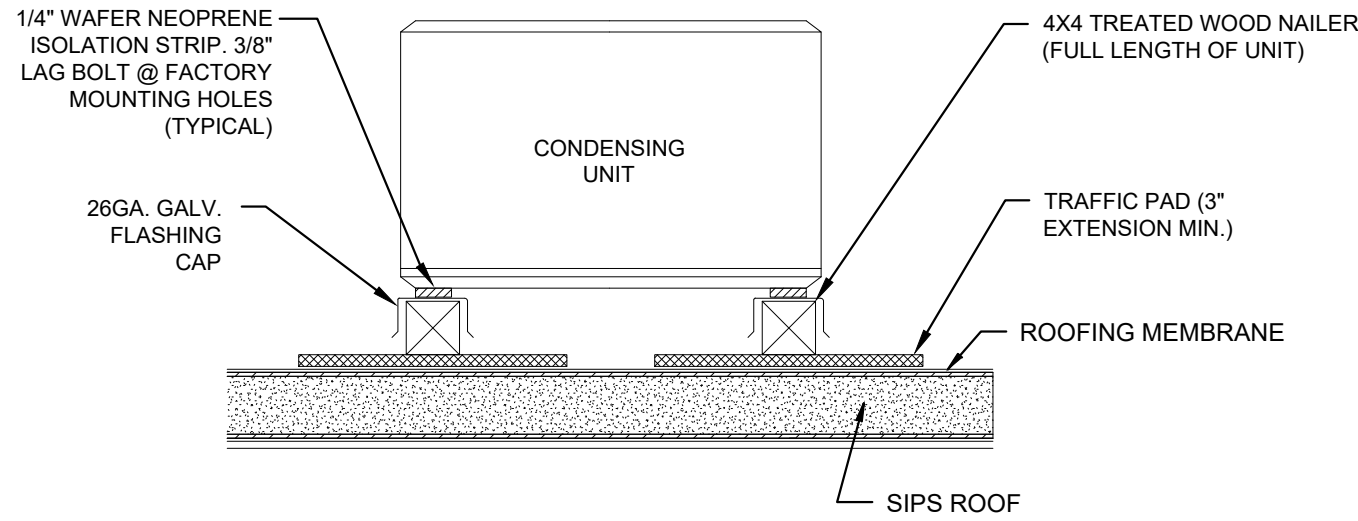
	RECTANGULAR DUCT 18" WIDE BY 12" DEEP (INSIDE CLEAR DIMENSIONS)
	12" DIAMETER ROUND DUCT (INSIDE CLEAR DIMENSIONS)
	SUPPLY DUCT IN SECTION
	RETURN OR EXHAUST DUCT IN SECTION
	ELBOW WITH TURNING VANES
	TEE WITH TURNING VANES
	ROUND (OR OVAL) ELBOW
	SUPPLY AIR DIFFUSER WITH ROUND SUPPLY DUCT
	RETURN OR EXHAUST AIR DIFFUSER WITH ROUND DUCT
	DIFFUSER OR GRILLE TYPE & CFM
	THERMOSTAT
	SPACE TEMP. SENSOR
	SPACE TEMP. / HUMIDITY / CO2 COMBO SENSOR
	SMOKE DETECTOR
	SMOKE DETECTOR TEST/RESET STATION
	BALANCE DAMPER

COMMISSIONING AND T&B REQUIRED AND A REPORT GENERATED USING 7-ELEVEN'S COMMISSIONING REPORT TEMPLATE. PROVIDE A COPY TO THE OWNER AND ENGINEER. IF HVAC SYSTEM AIRFLOW CANNOT BE BALANCED PER PLANS, CONTACT ENGINEER OF RECORD FOR RESOLUTION.

REF EMS1.0 SHEET FOR ADDITIONAL INFORMATION REGARDING THE BUILDING ENERGY MANAGEMENT SYSTEM CONTROLS. CONTACT AUTOMATED LOGIC (ALC) AT (866) 390-4275 UPON AWARD OF CONTRACT TO OBTAIN LIST OF CERTIFIED EMS INSTALLERS. DURING CONSTRUCTION, AT 2 WEEKS PRIOR TO BUILDING TURNOVER, CONTACT ALC TO COORDINATE DELIVERY OF EMS PANEL. AFTER INSTALLATION OF EMS PANEL INCLUDING CONNECTION OF CABLES, CONTACT ALC FOR START-UP OF EMS PANEL. START-UP TO BE DONE 2-3 DAYS PRIOR TO BUILDING TURNOVER.

LAY-IN CEILING NOTE: SUPPLY AIR DEVICES SHALL BE INDICATED AS 3-WAY AIR DEVICES WHEN LOCATED WITHIN A 10'-0" RADIUS OF THE OPEN AIR SANDWICH CASE

REMOTE CONDENSER SCHEDULE (MAXIMUM DESIGN AMBIENT TEMP 95°F - 120°F)							
MARK	MANUFACTURER	MODEL	DEFROST	V/PH	MCA	MOCP	WEIGHT
1 DOOR VAULT ICE MERCHANDISER (PROTO)	BOHN	BCH0005MBACZA0900	BEACON II	208/1	15	15	167
1-2 DOOR VAULT LOW TEMP FREEZER (PROTO)	BOHN	BCH0022LCACZA0900	BEACON II	208/3	15	15	173
10-12 DOOR VAULT COOLER (PROTO)	BOHN	BCH0050MCACZA0900	BEACON II	208/3	28.5	45	330
BEVERAGE ICE MAKER (HOSHIZAKI FD-1002MRJ-CB)	HOSHIZAKI	URC-5F	NA	115/1	*	*	60
FROZEN LEMONADE DISPENSER (FBD 561)	FBD	FBD-SRC	NA	208/1	1.8	15	105
SLURPEE DISPENSER (2x FBD 774)	FBD	FBD-DRC	NA	208/1	2.2	15	143
SANDWICH WALL CASE (SADEN RSC6)	BOHN	BCH0030MCACZA0000	AIR	208/3	20.6	30	297



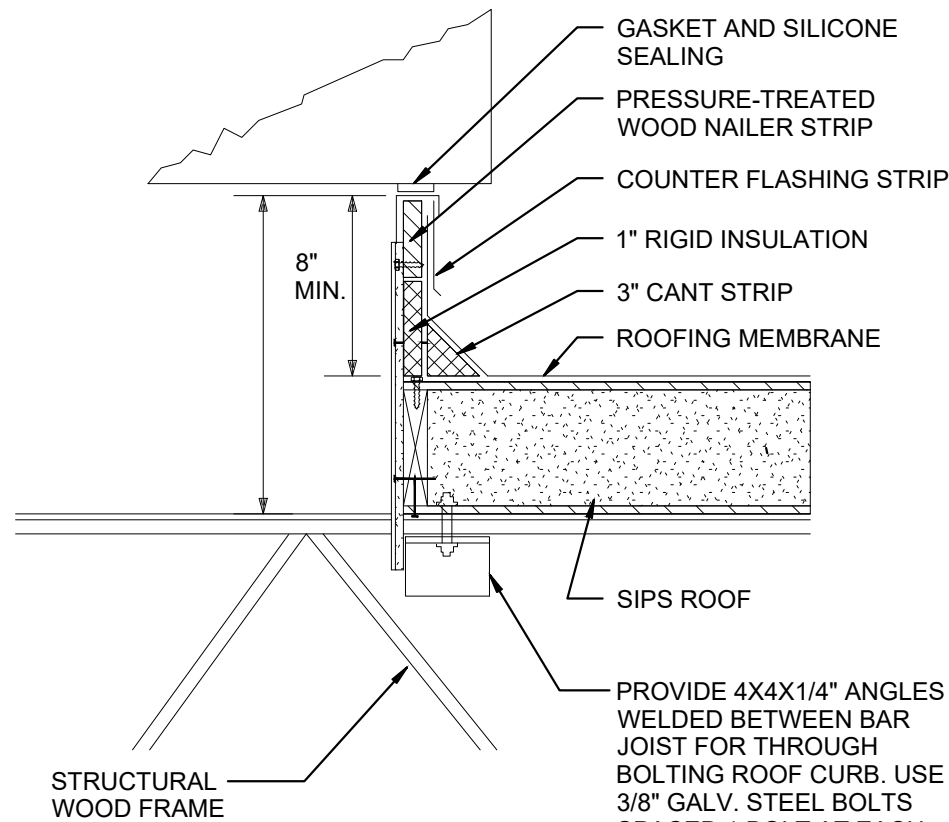
NOTE:
MECHANICAL CONTRACTOR SHALL LEVEL
EQUIPMENT CURB PRIOR TO MOUNTING UNIT.

3 CONDENSING UNIT DETAIL

N.T.S.

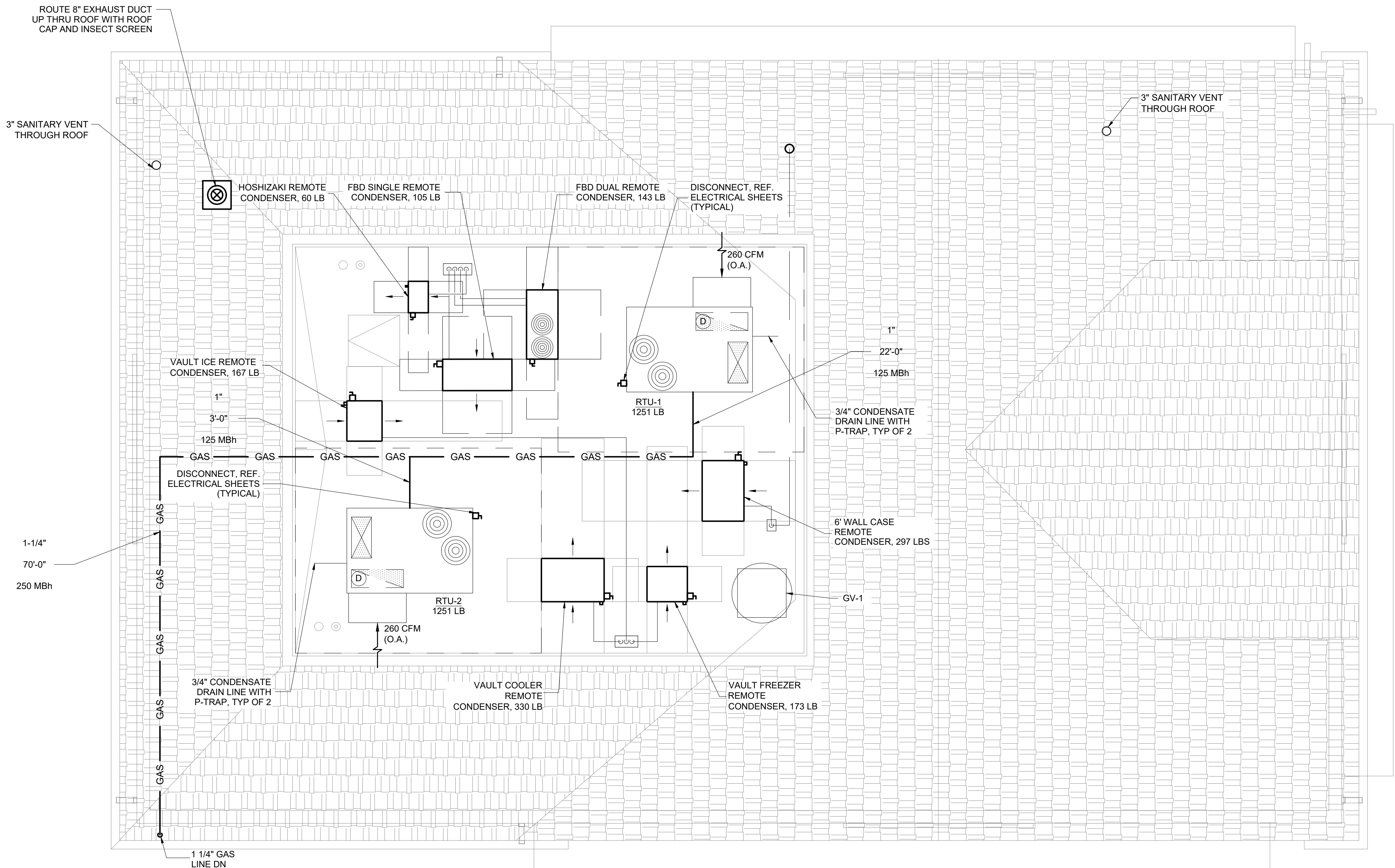
PROVIDE 1"x1/8" STEEL STRAP AT ALL CORNERS & NOT TO EXCEED 4'-0" O/C EACH ANCHORED W/ 4 #12 BY 3" LONG GALV. SCREWS TO ROOF CURB & W/ 4 #12 BY 1" LONG SCREWS TO RTU. THROUGH BOLT RTU TO CURB WITH 3/8" BOLTS, ONE AT EACH CORNER.

FACTORY CURB: NRCA APPROVED, 16 GAUGE, SQUARE WITHIN 1/8" ON DIAGONAL MEASUREMENT, WITH A MINIMUM OF 8" ABOVE TOP OF ROOF, WHEN IN DOUBT PROVIDE 18" OR GREATER CURB.



2 ROOF CURB DETAIL

N.T.S.



1 MECHANICAL ROOF PLAN

1/4" = 1'-0"