

MECHANICAL GENERAL NOTES:

GENERAL NOTES: MECHANICAL

- PROVIDE MATERIALS AND EQUIPMENT AND EXECUTE THE WORK, INCLUDING ALL TESTING AND INSPECTIONS, IN COMPLIANCE WITH THE APPLICABLE PROVISIONS OF FEDERAL, STATE AND LOCAL GOVERNMENT LAWS, ORDINANCES, REFERENCED CODES AND STANDARDS CURRENT AS OF THE ISSUE DATE OF THESE DRAWINGS. ALL MORE STRINGENT REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL MODIFY, SUPPLEMENT AND SUPERSEDE APPLICABLE PORTIONS OF GOVERNING LAWS, ORDINANCES, CODES AND STANDARDS.
- CONTRACTOR SHALL PRESENT CERTIFICATE TO THE OWNER THAT ALL APPLICABLE BUILDING PERMITS HAVE BEEN SECURED PRIOR TO STARTING ANY WORK, AND PROVIDE THE OWNER WITH ALL REQUIRED CERTIFICATES OF FINAL APPROVAL FROM THE GOVERNING JURISDICTIONS AT COMPLETION OF THE WORK. PROVIDE ALL SHOP DRAWINGS AS REQUIRED IN FOLLOWING SECTIONS.
- MAKE ALL CONNECTIONS TO EXISTING SYSTEMS DURING DESIGNATED PERIODS UPON APPROVAL OF THE OWNER AND AT NO INCREASE IN CONTRACT SUM.
- EXISTING FACILITIES:
 - DO NOT INTERRUPT EXISTING UTILITIES UTILIZED BY THE OWNER EXCEPT AS SPECIFIED OR WHEN APPROVED IN WRITING. AND THEN ONLY AFTER TEMPORARY UTILITY SERVICES HAVE BEEN APPROVED AND PROVIDED. INTERRUPTIONS MUST BE SCHEDULED TO SUIT THE OWNER'S REQUIREMENTS.
 - VERIFY ALL EXISTING WORK, WHERE EXISTING CONNECTIONS ARE PARTIAL, PROVIDE ALL NECESSARY MATERIALS, LABOR AND EQUIPMENT REQUIRED TO MODIFY EXISTING WORK. IN ADDITION, MAINTAIN INTEGRITY OF THE EXISTING SYSTEMS. RECTIFY ANY CONTAMINATION, DEGRADATION OF CLEANLINESS OR DAMAGE TO THE EXISTING SYSTEMS TO THE SATISFACTION OF THE OWNER. PROVIDE ALL WORK SO REQUIRED AT NO INCREASE IN THE CONTRACTOR'S ORIGINAL PROPOSAL.
- COORDINATE EXACT LOCATION OF CONSTRUCTION TO PRECLUDE ANY INTERFERENCES BETWEEN PIPING, WIRING, LIGHTING FIXTURES, DUCTWORK, BUILDING EQUIPMENT, PROCESS EQUIPMENT AND OTHER CONSTRUCTION.
- PROVIDE LABOR, INCLUDING FIELD ERECTION AND SUPERVISION, MATERIALS, EQUIPMENT AND ANCILLARIES, AND COORDINATE, PROCURE, FABRICATE, DELIVER, ERECT OR INSTALL, INTERFACE WITH EXISTING WORK, START, DEBUG AND TEST ALL SYSTEMS AS NECESSARY TO PROVIDE THE OWNER WITH A COMPLETE, OPERATING FACILITY IN CONFORMANCE WITH THE CONSTRUCTION BID DOCUMENTS.
- ALL CUTTING AND PATCHING THAT MAY BE NECESSARY FOR THE INSTALLATION OF THE MECHANICAL CONTRACTOR'S WORK SHALL BE PERFORMED AND REPAIRED BY THE TRADE WHOM NORMALLY PERFORMS THAT WORK AND PAID FOR BY THE MECHANICAL CONTRACTOR. NO CUTTING OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT BEING PREVIOUSLY OBTAINED.
- THE MECHANICAL CONTRACTOR SHALL VISIT

THE SITE PRIOR TO SUBMITTING HIS BID TO FAMILIARIZE HIMSELF WITH THE ACTUAL PROJECT CONDITIONS AND TO CHECK FOR ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF THE OTHER TRADES, AND/OR ANY APPARENT VIOLATIONS OF LOCAL OR STATE CODES, LAWS, ORDINANCES AND REGULATIONS, SHOULD ANY VIOLATIONS OR INTERFERENCES APPEAR AND DEPARTURE FROM THE DESIGN INTENT OF THE CONTRACT DOCUMENTS IS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO ENTERING INTO A CONTRACT WITH THE OWNER. FAILURE TO PROVIDE THE ARCHITECT WITH THE AFOREMENTIONED NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE INTENT OF THE CONTRACT DOCUMENTS WITH NO ADDITIONAL EXPENSES BEING INCURRED BY THE OWNER.

- THE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATIONS AND ARRANGEMENTS OF ALL THE EQUIPMENT AND PIPING. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER WORK WILL PERMIT. DO NOT SCALE DRAWINGS FOR EXACT MEASUREMENTS.
- DEMOLITION OF MECHANICAL EQUIPMENT SHALL INCLUDE ALL EXISTING PIPING, VALVES, CONTROLS, SUPPORTS, FLUES AND EQUIPMENT WHERE SUCH ITEMS ARE NOT REQUIRED FOR THE PROPER OPERATION OF THE REVISED SYSTEM. REMOVE, RECONNECT, CAP, PLUG AND REPLACE EXISTING PIPING AND DUCTWORK.

GENERAL NOTES: HVAC SYSTEM

- EXISTING HVAC UNITS, MAKEUP AIR UNITS, DUCTWORK, DIFFUSERS, GRILLES, REGISTERS, ETC. SHALL REMAIN UNLESS OTHERWISE NOTED.
- SHEET METAL DUCTWORK CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "SMACNA" STANDARDS, NFPA 90A AND 96, AND THE LATEST EDITION OF THE ASHRAE GUIDE AND DATA BOOKS. ALL DUCTWORK SIZES INDICATED ON THE PLANS ARE THE INTERNAL DIMENSIONS AND DUCTWORK SIZES SHALL BE INCREASED ACCORDING SHOULD DUCTWORK BE INTERNALLY LINED WITH INSULATION. ALL DUCTWORK SHALL BE SEALED AIR TIGHT AND SHALL NOT ALLOW MORE THAN 10% AIR LEAKAGE THROUGHOUT THE ENTIRE SYSTEM.
- ALL DUCTWORK SHALL BE CONCEALED. EXPOSING OF ANY DUCTWORK MUST HAVE PRIOR APPROVAL OF THE ARCHITECT.
- THE CONTRACTOR HAS THE OPTION OF REVISING DUCTWORK SIZES TO OTHERS OF EQUIVALENT CROSS SECTIONAL AREA SHOULD SPACE PERMIT.
- PROVIDE VOLUME DAMPERS IN THE DUCT SYSTEMS WHERE SHOWN ON PLANS AND WHERE REQUIRED TO INSURE PROPER SYSTEM BALANCING. SPIN IN FITTINGS WITH MANUAL VOLUME DAMPERS MAY BE USED. WHERE DAMPERS ARE CONCEALED, CABLE OPERATED REMOTE CONTROLLED DAMPERS SIMILAR TO YOUNG REGULATOR MODEL "830ACC" OR "830ACCS" FOR RECTANGULAR DUCTS AND "5020CC" OR "5020CC2" FOR ROUND DUCTS SHALL BE USED.
- PROVIDE FLEXIBLE DUCT CONNECTORS ON ALL DUCT CONNECTIONS TO AIR HANDLING EQUIPMENT.
- THE CONTRACTOR SHALL SUBMIT TO THE

ARCHITECT A COMPLETE AIR BALANCE REPORT OF ALL AIR HANDLING SYSTEMS. THE REPORT SHALL INCLUDE FAN RPM, TOTAL STATIC PRESSURE, MOTOR RATED AMPACITY, MOTOR OPERATING AMPACITY, ENTERING AND DISCHARGE AIR TEMPERATURES, AIR QUANTITIES AT ALL DIFFUSERS AND GRILLES, A DIAGRAM OF THE AIR HANDLING SYSTEM INSTALLED, AND RECOMMENDATIONS TO CORRECT ANY DEFICIENCIES. THE AIR BALANCE REPORT SHALL BE PERFORMED BY AN INDEPENDENT N.E.B.B. CERTIFIED AIR BALANCE CONTRACTOR.

- DUCTWORK INSULATION:
 - ALL SUPPLY DUCTWORK INSIDE OF THE BUILDING, IN UNCONDITIONED SPACES, SHALL BE INSULATED WITH MINIMUM R-3.5 DUCT WRAP.
 - ALL DUCTWORK EXPOSED OUTSIDE OF THE BUILDING SHALL BE SEALED AND COVERED WITH FIBERGLASS BOARD INSULATION WITH F.S.K. FACING WITH A MINIMUM R-VALUE OF R-12 (CLIMATE ZONE 5).
 - ALL INSULATION SHALL BE JACKED WITH A UL LISTED INSULATION JACKETING TAPE SIMILAR TO VENTURE TAPE 1577CW OR APPROVED EQUAL. INSTALL ALL JACKETING PER MANUFACTURER'S RECOMMENDATIONS.
 - DUCTS OR PLENUMS LOCATED WITHIN A VENTILATED ATTIC OR WITHIN AN UNVENTILATED ATTIC ABOVE AN INSULATED CEILING SHALL BE INSULATED WITH A MINIMUM R-6 INSULATION.
 - DUCTWORK INSULATION SHALL HAVE A FLAME SPREAD/SMOKE DENSITY RATING

VIBRATION ABSORBING SUPPORTS SHALL BE INSTALLED AS REQUIRED ON ALL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION AND NOISE TO THE STRUCTURE. PROVIDE VIBRATION ISOLATION PER A.S.H.R.A.E. STANDARDS.

ALL MECHANICAL EQUIPMENT LOCATED ON THE ROOF SHALL BE PROPERLY SUPPORTED WITH PRE-FABRICATED CURBS, EQUIPMENT RAILS, OR OTHER MEANS AS APPROVED BY THE ARCHITECT.

HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS ARE DESIGNED ON THE FOLLOWING CONDITIONS:

WINTER:
INSIDE TEMP. 72 °F.,
OUTSIDE TEMP. 1.4 °F. & 15 MPH WIND.

SUMMER:
INSIDE TEMP. 78 °F. D.B. & 50% R.H.
OUTSIDE TEMP. 90.3 °F. D.B. & 73.8 °F. W.B.

- SHEET METAL RUN-OUTS AND FLEX DUCT CONNECTIONS TO AIR DISTRIBUTION DEVICES SHALL BE THE SAME SIZE AS THE DEVICE NECK, UNLESS OTHERWISE NOTED.
- DUCTS CONNECTING TO HVAC EQUIPMENT SHALL BE THE SAME SIZE AS EQUIPMENT DUCT CONNECTIONS, UNLESS OTHERWISE NOTED.
- FIRE DAMPERS SHALL BE DYNAMIC STYLE WITH TYPE-B BLADES COMPLETELY OUT OF THE AIRSTREAM. DAMPERS SHALL MEET ALL NFPA REQUIREMENTS AND BE UL-555 LISTED.
- ALL FLUES AND COMBUSTION AIR DUCTS FROM CONDENSING HIGH EFFICIENCY APPLIANCES SHALL BE VENTED PER THE INDIVIDUAL APPLIANCE MANUFACTURER'S RECOMMENDATIONS. VENT MATERIAL SHALL BE CORROSION RESISTANT AL29-4C, PVC OR CPVC AS REQUIRED BY THE MANUFACTURER.
- AIR DISTRIBUTION DEVICE LOCATIONS INDICATED ON THE PLANS ARE

APPROXIMATE. THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS OF ALL AIR DISTRIBUTION DEVICES WITH ARCHITECTURAL PLANS AND/OR ELECTRICAL PLANS PRIOR TO INSTALLATION. LIGHT FIXTURES AND SPRINKLER HEAD LOCATIONS SHALL TAKE PRECEDENCE OVER AIR DISTRIBUTION DEVICES, UNLESS OTHERWISE NOTED.

- COMBINATION FIRE/SMOKE DAMPERS SHALL BE DYNAMIC STYLE. DAMPERS SHALL MEET ALL NFPA 90A REQUIREMENTS AND BE U.L. 555 AND U.L. 555S LISTED.

THE CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION OF ANY OF THE FOLLOWING:

- HVAC UNITS
- DEDICATED OUTDOOR AIR UNIT
- EXHAUST FANS
- AIR DISTRIBUTION DEVICES
- AIR DUCT ACCESSORIES

APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO CONFORM TO THE DESIGN INTENT OF THE BID DOCUMENTS.

APPROVAL OF SHOP DRAWINGS IS INTENDED TO BE FOR GENERAL CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS ONLY. ANY EQUIPMENT THAT IS INSTALLED THAT WILL INVOLVE THE WORK OF OTHER TRADES SHALL BE COORDINATED WITH THOSE TRADES. REFER TO OTHER TRADE'S BID DOCUMENTS.

THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONTROL AND INTERLOCK WIRING UNLESS OTHERWISE NOTED ON THE DRAWINGS. MECHANICAL CONTRACTOR SHALL PAY AND COORDINATE WITH THE ELECTRICAL CONTRACTOR ALL HIGH VOLTAGE WIRING THAT IS REQUIRED FOR INTERLOCKING OF CONTROLS.

CONTRACTOR SHALL PROVIDE BUILDING OWNER WITH OPERATING AND MAINTENANCE MANUALS FOR ALL H.V.A.C. EQUIPMENT UPON COMPLETION OF PROJECT.

MECHANICAL CONTRACTOR SHALL TEST ALL CONTROL ELEMENTS, VERIFY CALIBRATION OF ALL CONTROL DEVICES AND MAKE ADJUSTMENTS AS REQUIRED AT COMPLETION OF PROJECT.

COORDINATE NEW DUCTWORK WITH BUILDING STRUCTURAL CONDITIONS, EQUIPMENT MANUFACTURER RECOMMENDATIONS AND ALL OTHER TRADES TO AVOID INTERFERENCES.

PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

ALL MECHANICAL RELATED CORING THROUGH WALLS AND FLOORS SHALL BE BY MECHANICAL CONTRACTOR. SEAL ALL PENETRATIONS THROUGH RATED WALLS AND FLOORS WITH U.L. RATED CAULK SEALANT IN ACCORDANCE WITH THE SPECIFICATION REQUIREMENTS.

ALL DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE ABOVE CEILINGS OR IN ARCHITECTURAL SOFFITS, WHERE INDICATED ON DRAWINGS.

COORDINATE ROUTING WITH ARCHITECTURAL AND STRUCTURAL TRADES TO AVOID INTERFERENCES.

ALL FLEXIBLE DUCTWORK SHALL BE LIMITED TO 5'-0" MAXIMUM LENGTH FROM HARD DUCT CONNECTION TO ROUND NECK SUPPLY AIR DIFFUSERS. FLEX DUCT APPROVED ABOVE ACCESSIBLE CEILING ONLY.

CONTRACTOR SHALL MAINTAIN ADEQUATE CLEARANCES (PER N.E.C.) ABOVE AND AROUND ANY ELECTRICAL PANELS, EQUIPMENT AND TRANSFORMERS WHEN ROUTING DUCTWORK.

HVAC SYMBOLS

NOTE: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT

SYMBOL	DESCRIPTION
	RETURN AIR GRILLE
	RETURN AIR GRILLE WITH SOUND BOOT
	SUPPLY AIR DIFFUSER
	VOLUME DAMPER
	VERTICAL FIRE DAMPER
	THERMOSTAT OR SENSOR
	HUMIDISTAT
	CONNECT NEW TO EXISTING

SYMBOL	DESCRIPTION
	SUPPLY AIR ELBOW UP DIMENSION DESCRIPTION: 1ST FIGURE = SIDE SHOWN 2ND FIGURE = SIDE NOT SHOWN ALL SIZES IN INCHES
	SUPPLY AIR ELBOW DOWN
	EXHAUST/RETURN AIR ELBOW UP
	EXHAUST/RETURN AIR ELBOW DOWN
	DOUBLE SIDE TRANSITION TRANSITION SLOPE SPECIFICATION: MINIMUM SLOPE = 15° MAXIMUM SLOPE = 45° ALL SIZES IN INCHES
	SINGLE SIDE TRANSITION
	TOP TRANSITION (SLOPE ON TOP)
	RECTANGULAR TO ROUND TRANSITION
	ELBOW UP DIMENSION DESCRIPTION: 14"Ø = ROUND DUCT 24"x12" FO = FLAT OVAL DUCT
	ELBOW DOWN
	ELBOW - RADIUS (R) = 1.5 TIMES DIAMETER OF DUCT

DEMOLITION SYMBOLS

SYMBOL	DESCRIPTION
	EXISTING SERVICE AND OR EQUIPMENT TO BE REMOVED.
	EXISTING SERVICE AND OR EQUIPMENT TO REMAIN.
	NEW SERVICE AND OR EQUIPMENT.
	EXISTING SERVICE TO BE CAPPED
	DEMOLITION LIMIT AND POINT OF NEW CONNECTION.
	NEW CONNECTION TO EXISTING SERVICE AND OR EQUIPMENT.
	REMOVED EQUIPMENT
	EXISTING

MECHANICAL GENERAL NOTES:

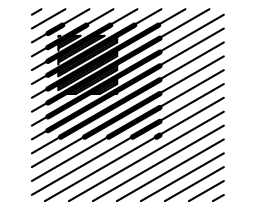
- COORDINATE NEW DUCTWORK WITH BUILDING STRUCTURAL CONDITIONS, EQUIPMENT MANUFACTURER RECOMMENDATIONS AND ALL OTHER TRADES TO AVOID INTERFERENCES.
- PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.
- ALL MECHANICAL RELATED CORING THROUGH WALLS AND FLOORS SHALL BE BY MECHANICAL CONTRACTOR. SEAL ALL PENETRATIONS THROUGH RATED WALLS AND FLOORS WITH U.L. RATED CAULK SEALANT IN ACCORDANCE WITH THE SPECIFICATION REQUIREMENTS.
- ALL DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE ABOVE CEILINGS OR IN ARCHITECTURAL SOFFITS, WHERE INDICATED ON DRAWINGS.
- COORDINATE ROUTING WITH ARCHITECTURAL AND STRUCTURAL TRADES TO AVOID INTERFERENCES.
- ALL NEW DUCT SIZES TO DIFFUSERS SHALL MATCH NECK SIZE OF DIFFUSER OR GRILLE.
- COORDINATE EXACT LOCATIONS OF DIFFUSERS AND RETURN GRILLES WITH ARCHITECTURAL AND ELECTRICAL REFLECTED CEILING PLANS AND ARCHITECTURAL INTERIOR ELEVATIONS.
- COORDINATE ALL T-STAT HEIGHTS ABOVE FINISHED FLOOR WITH ARCHITECTURAL TRADES.
- BALANCE AIR SYSTEMS TO VALUES INDICATED ON DRAWINGS.
- ALL FLEXIBLE DUCTWORK SHALL BE LIMITED TO 5'-0" MAXIMUM LENGTH FROM HARD DUCT CONNECTION TO ROUND NECK SUPPLY AIR DIFFUSERS. FLEX DUCT APPROVED ABOVE ACCESSIBLE CEILING ONLY.

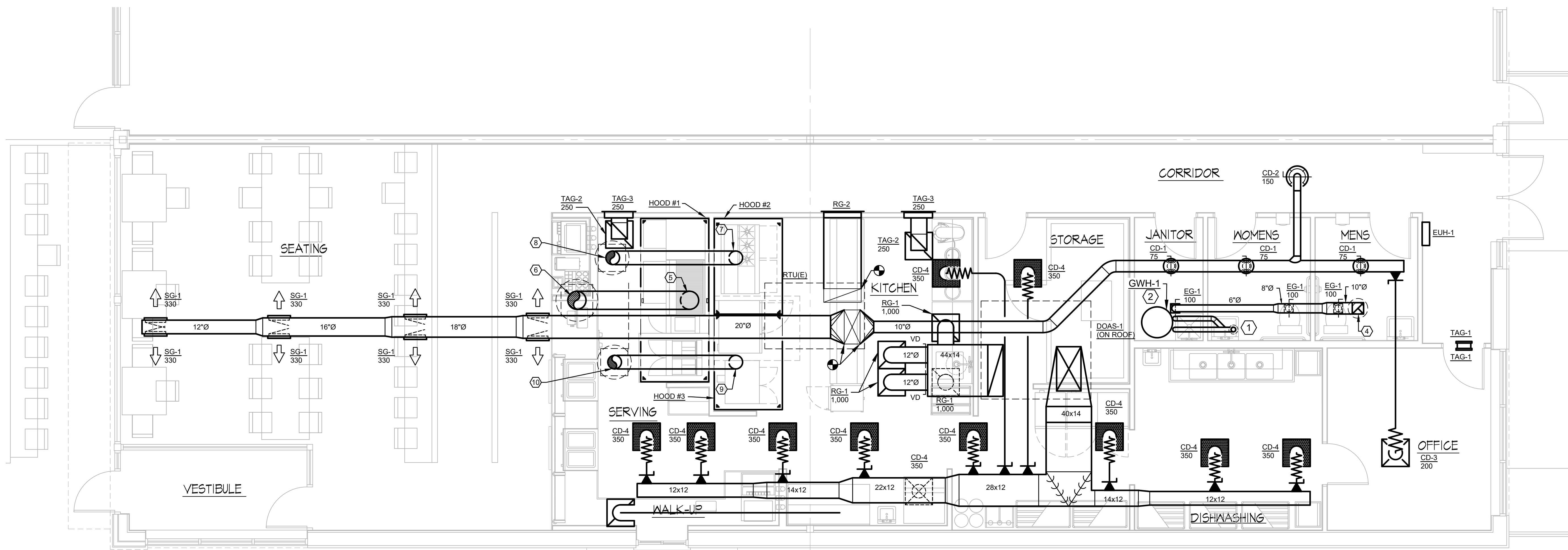
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
A.L.	ACOUSTIC DUCT LINER
B.O.D.	BOTTOM OF DUCT
CD-#	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CL	CENTERLINE
CLG	CEILING
D.B.	DRY BULB TEMPERATURE
DU-#	DEHUMIDIFICATION UNIT
DIA./Ø	DIAMETER
DSG	DUCT SUPPLY GRILLE
(E)	EXISTING
E.A.	EXHAUST AIR
EF-#	EXHAUST FAN
EG-#	EXHAUST GRILLE
ERH-#	ELECTRIC RADIANT HEATER
EXH.	EXHAUST
FSR-#	FLOOR SUPPLY REGISTER
GF-#	GAS FURNACE
GUH-#	GAS UNIT HEATER
ID	INSIDE DIAMETER
N.T.S.	NOT TO SCALE
O.A.	OUTSIDE AIR
O.E.D.	OPEN ENDED DUCT
RA	RETURN AIR
RG-#	RETURN AIR GRILLE
R.H.	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RTU-#	ROOFTOP UNIT
SG-#	SUPPLY AIR GRILLE
S.A.	SUPPLY AIR
T.A.D.	TRANSFER AIR DUCT
TAG-#	TRANSFER AIR GRILLE
(TYP)	TYPICAL
VD	VOLUME DAMPER
W.B.	WET BULB TEMPERATURE
WSR-#	WALL SUPPLY REGISTER

NOT FOR CONSTRUCTION

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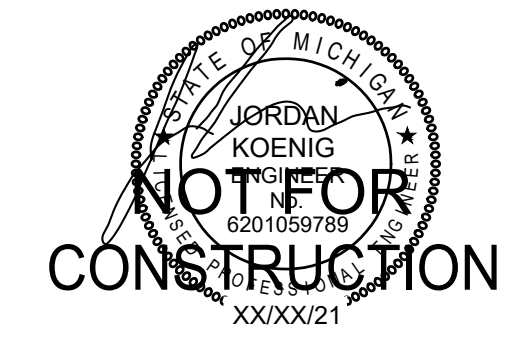
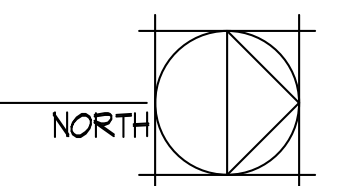




- KEY NOTES:**
- MECHANICAL CONTRACTOR SHALL PROVIDE 3" PVC FLUE & C.A. FROM WATER HEATER UP TO 4" CONCENTRIC PVC VENT THROUGH ROOF. VENT PER MANUFACTURER'S RECOMMENDATIONS AND INSTALL A MINIMUM OF 10'-0" FROM ANY OUTDOOR AIR INTAKE OPENING ON ROOF.
 - MOUNT WATER HEATER ON 4" HOUSEKEEPING PAD.
 - RETURN AIR WITH 1" ACOUSTIC DUCT LINER.
 - 10X10 EXHAUST DUCT UP TO EF-1 ON ROOF.
 - 16"Ø GREASE EXHAUST DUCT DOWN TO HOOD #1.
 - 16"Ø GREASE EXHAUST DUCT UP TO KEF-1 ON ROOF.
 - 12"Ø GREASE EXHAUST DUCT DOWN TO HOOD #2.
 - 12"Ø GREASE EXHAUST DUCT UP TO KEF-2 ON ROOF.
 - 12"Ø GREASE EXHAUST DUCT DOWN TO HOOD #3.
 - 12"Ø GREASE EXHAUST DUCT UP TO KEF-3 ON ROOF.

AIR BALANCE SCHEDULE		
AIR SYSTEM	EXHAUST AIRFLOW (CFM)	OUTDOOR AIRFLOW DESIGN (CFM)
EXHAUST FAN KEF-1	- 2,250	
EXHAUST FAN KEF-2	- 1,330	
EXHAUST FAN KEF-3	- 1,330	
MAKEUP AIR UNIT DOAS-1		+ 4,210
RTU-1		+ 500
TOTALS:	- 4,910	+ 4,710

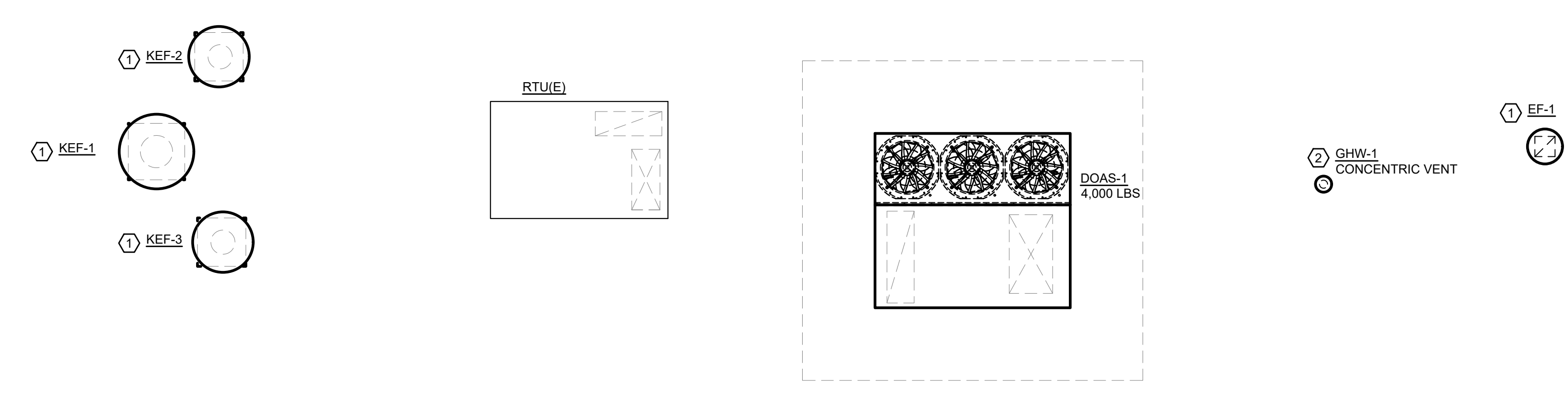
FLOOR PLAN - MECHANICAL NEW WORK
 SCALE: 1/4" = 1'-0"



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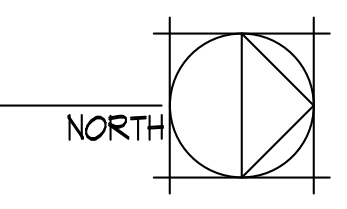
PROPOSED RESTAURANT TENANT SPACE
 YUMM
 3565 AUBURN ROAD, AUBURN HILLS, MICHIGAN 48326
 FLOOR PLAN - MECHANICAL NEW WORK
 PROJECT 17/508
 DATE 07/13/2021 45% Review
 REVISIONS

- KEY NOTES:** (#)
1. INSTALL EXHAUST FAN AT A MINIMUM OF 10'-0" FROM ANY ROOFTOP UNIT'S FRESH AIR INTAKE OPENING.
 2. WATER HEATER CONCENTRIC VENT. INSTALL PER DETAIL ON DRAWING M02.01 AT A MINIMUM OF 10'-0" FROM ALL INTAKE AIR OPENING.



ROOF PLAN - HVAC NEW WORK

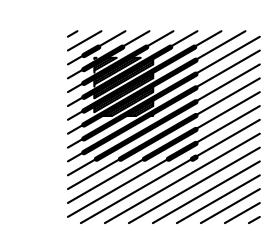
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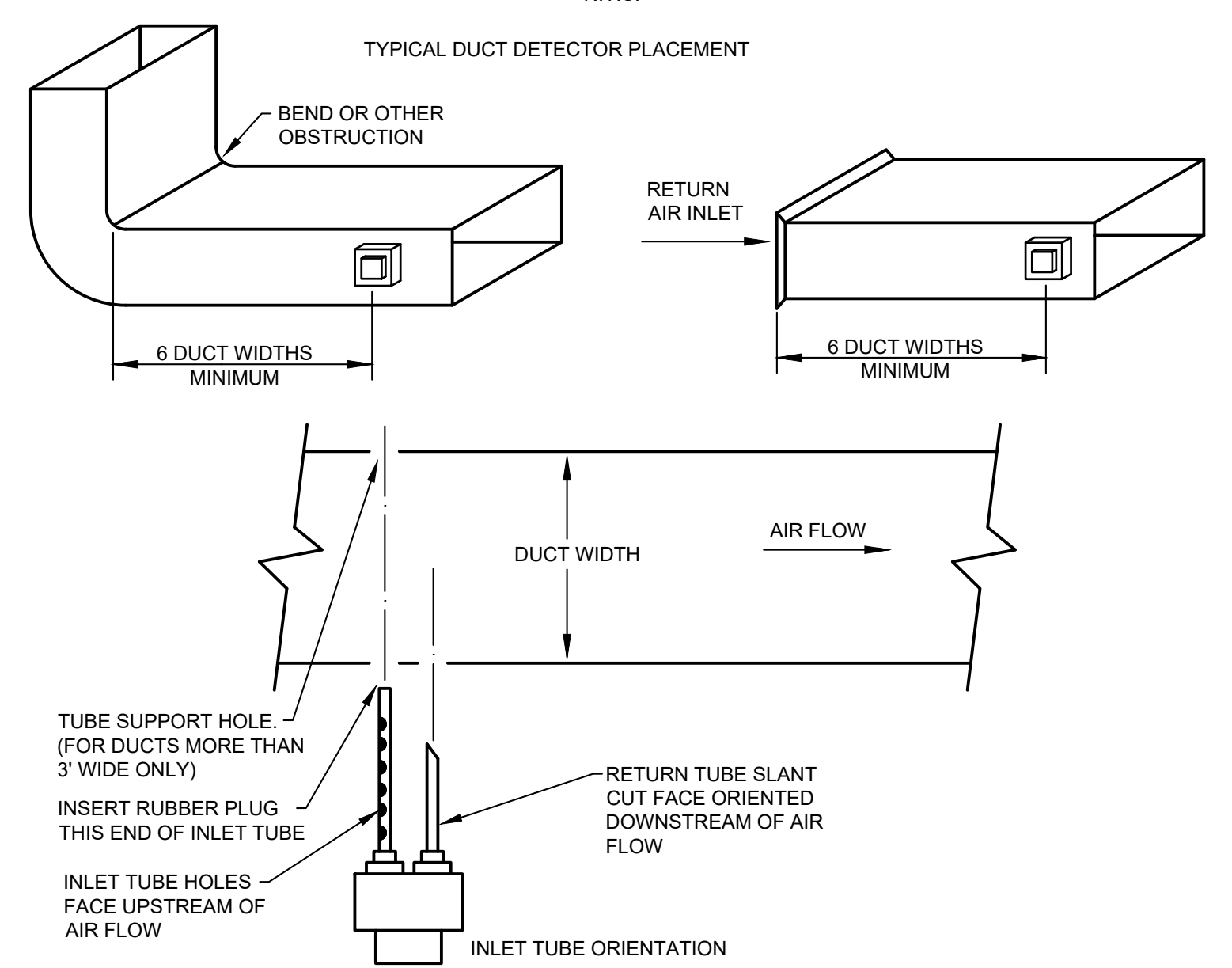
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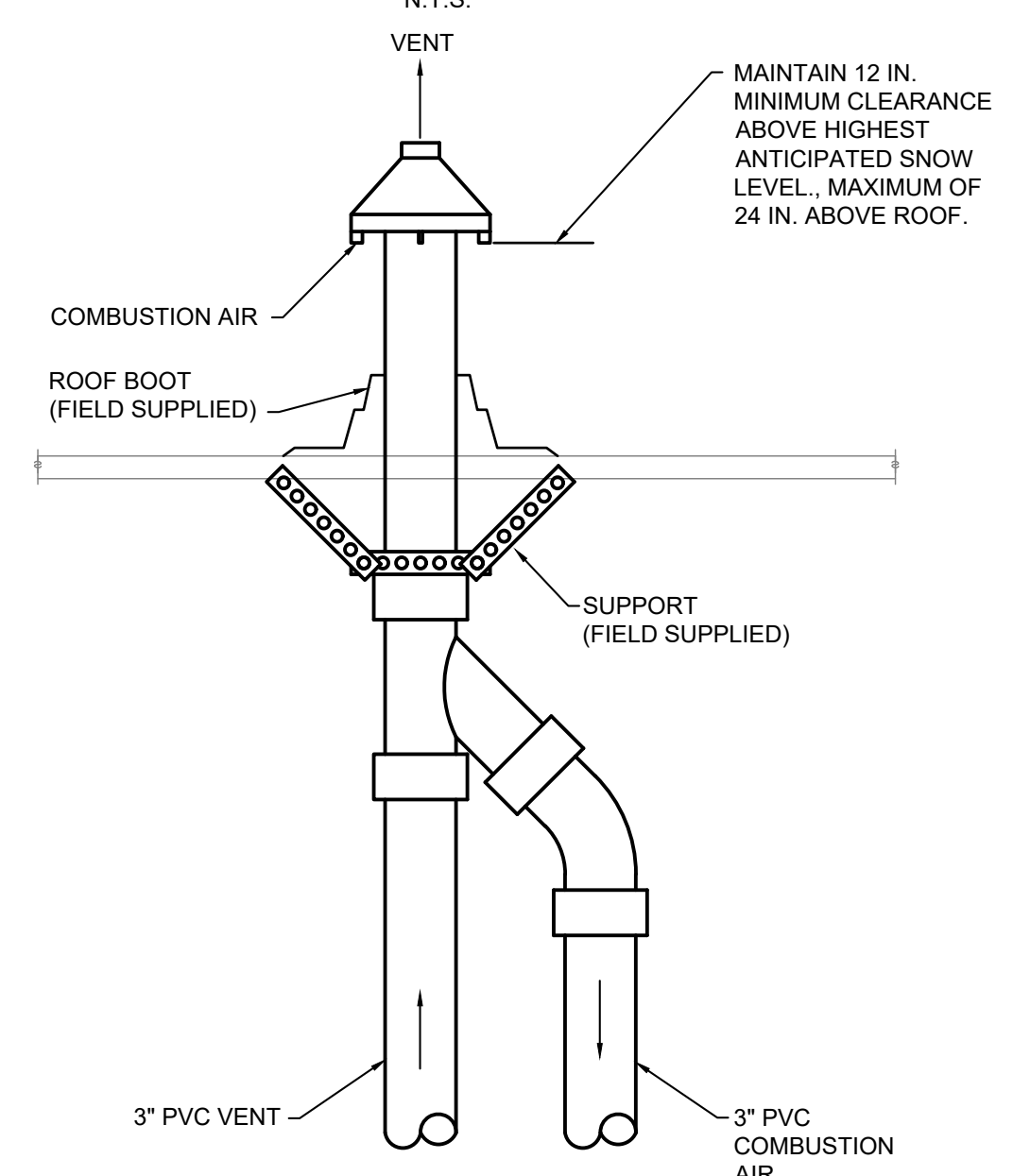
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EXHAUST DUCT ROOF PENETRATION DETAIL
 N.T.S.

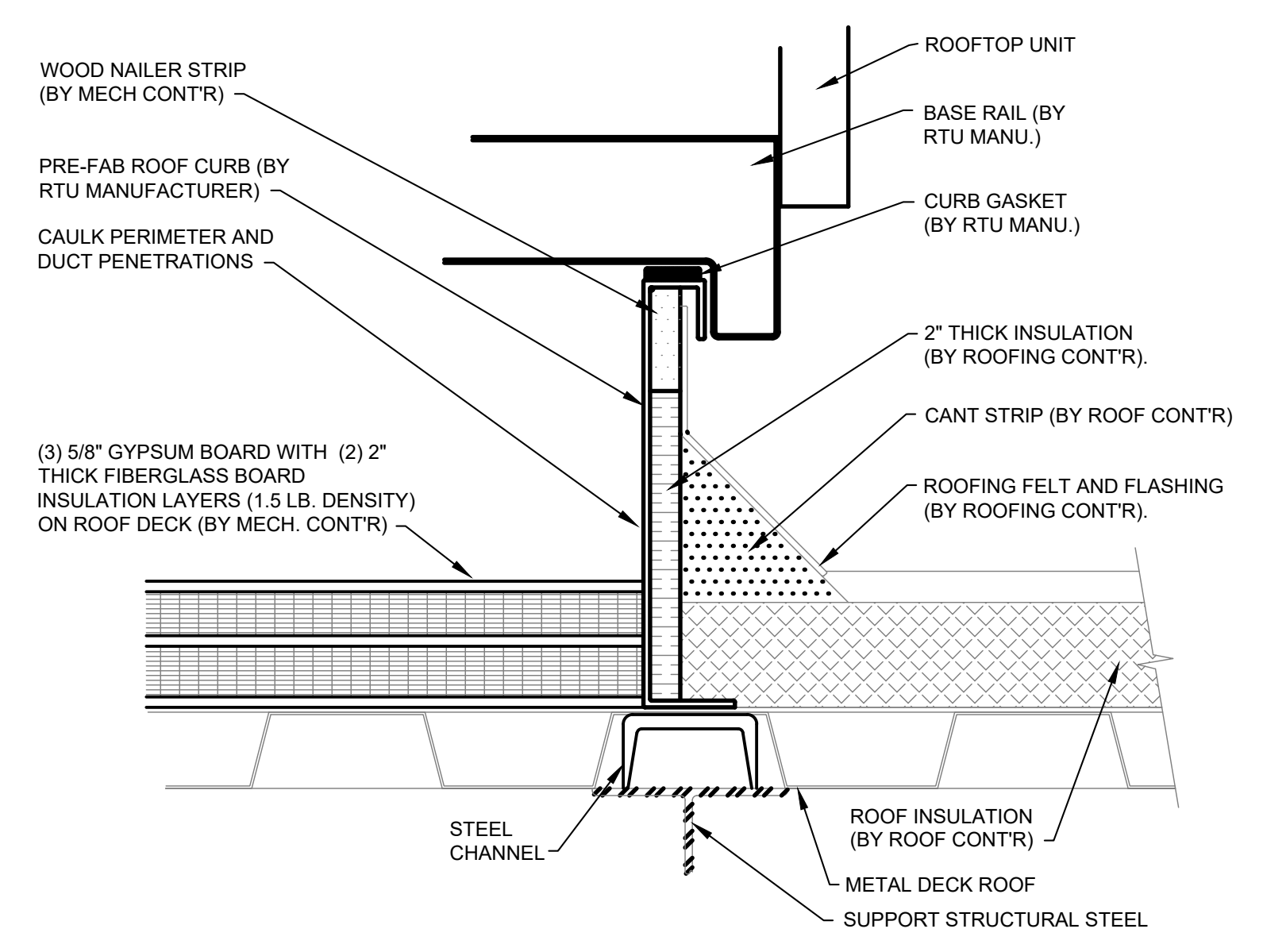


DUCT MOUNTED SMOKE DETECTOR DETAIL
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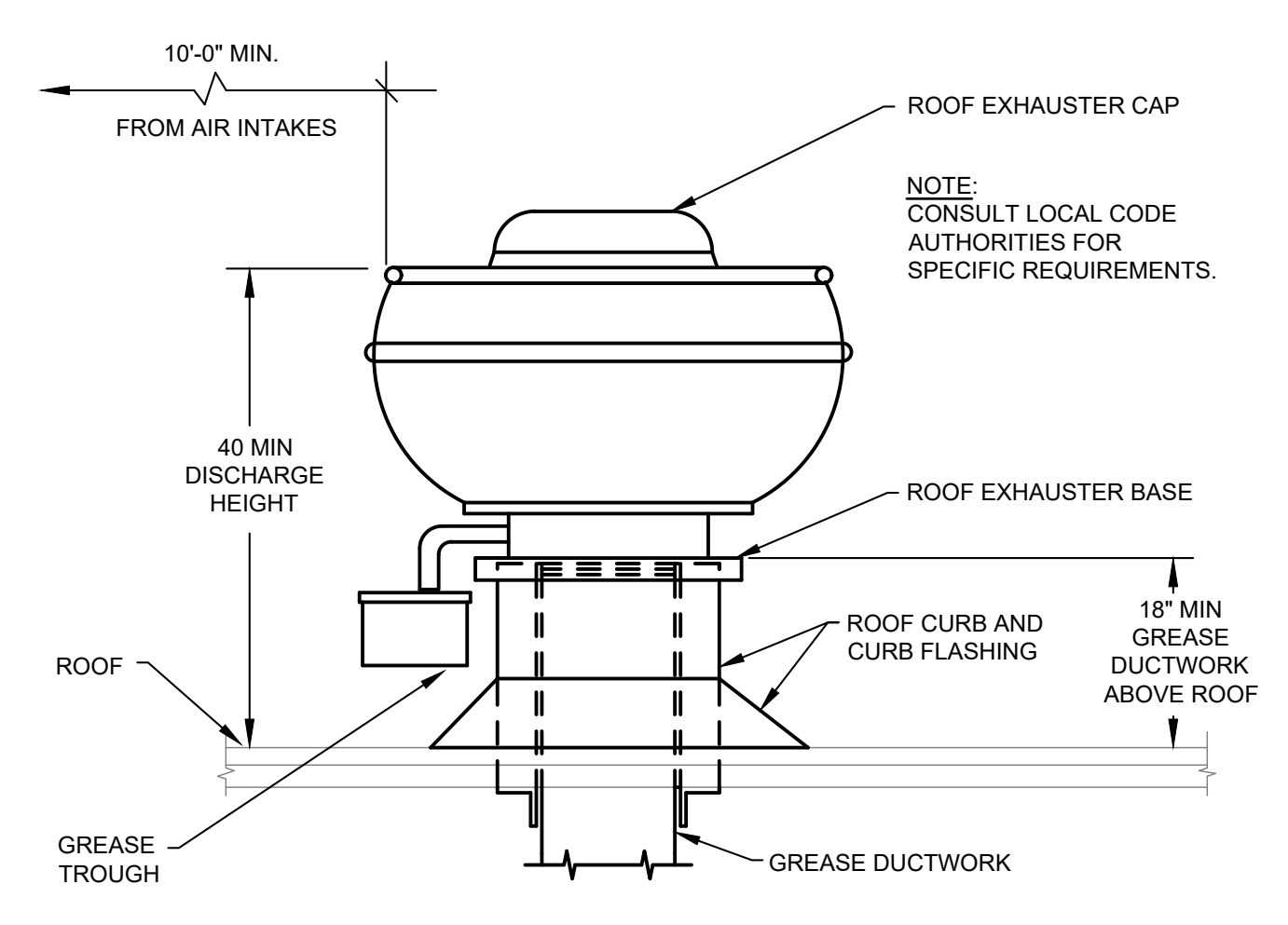


CONCENTRIC VENT ROOF DETAIL
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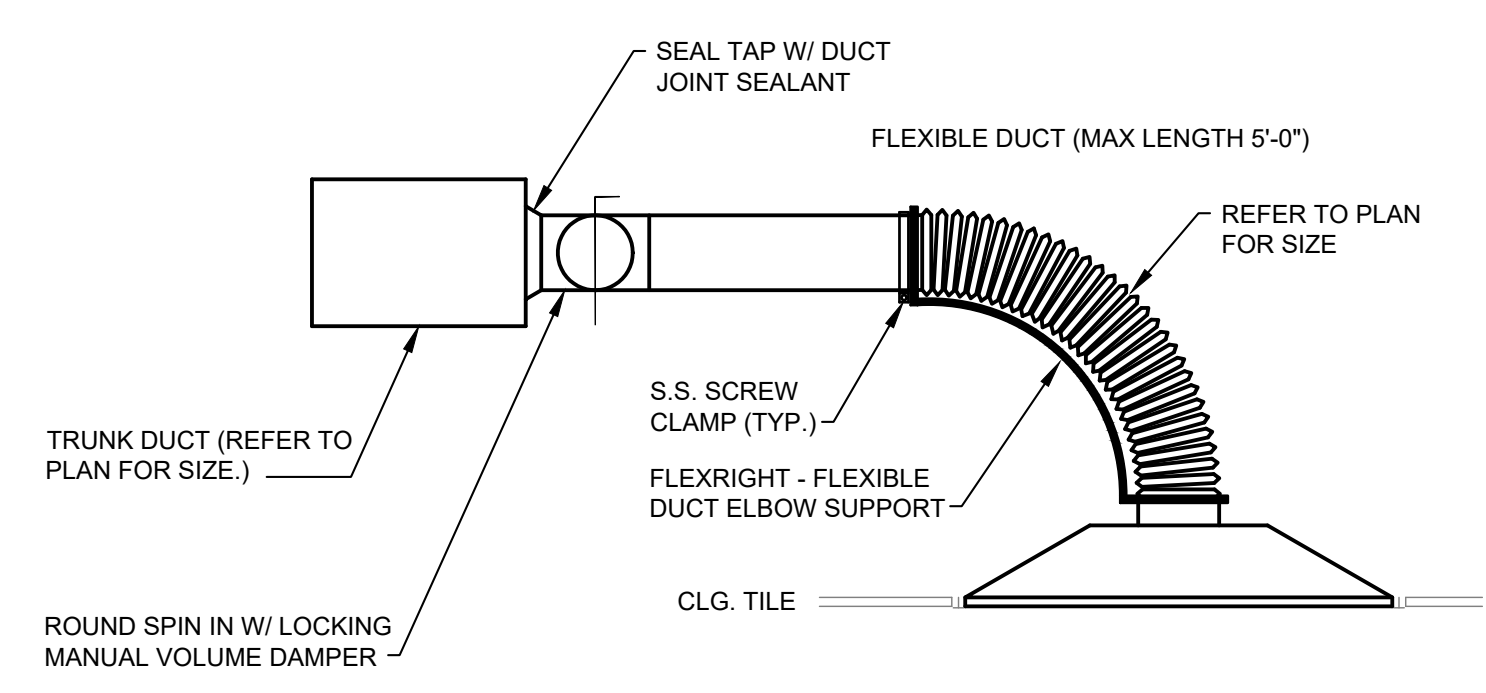
TYPICAL ROOFTOP UNIT CURB DETAIL WITH INSULATION
 N.T.S.



ROOF MOUNTED UPBLAST KITCHEN EXHAUST DETAIL
 N.T.S.



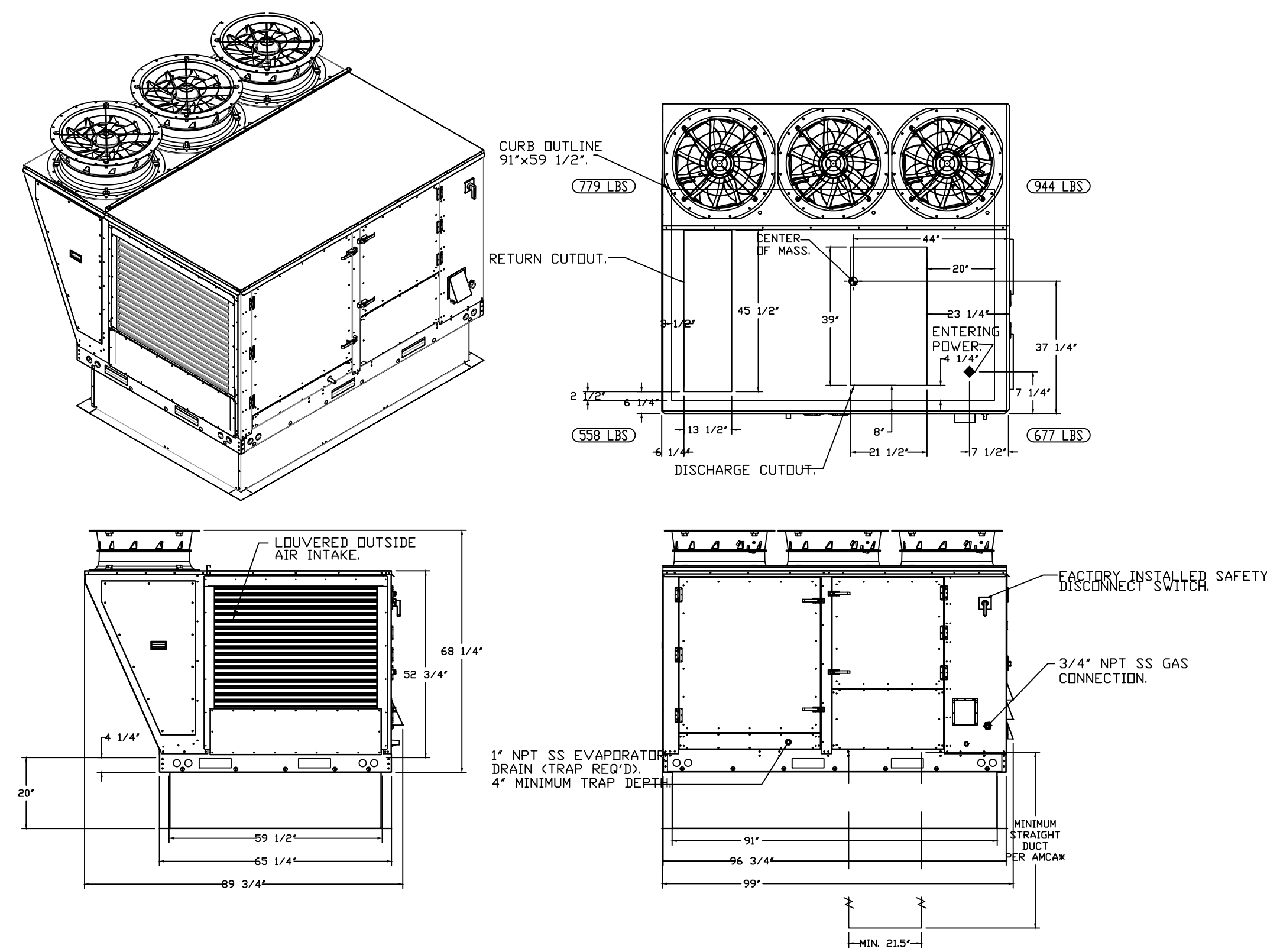
SPIN-IN AND CEILING DIFFUSER DETAIL
 N.T.S.



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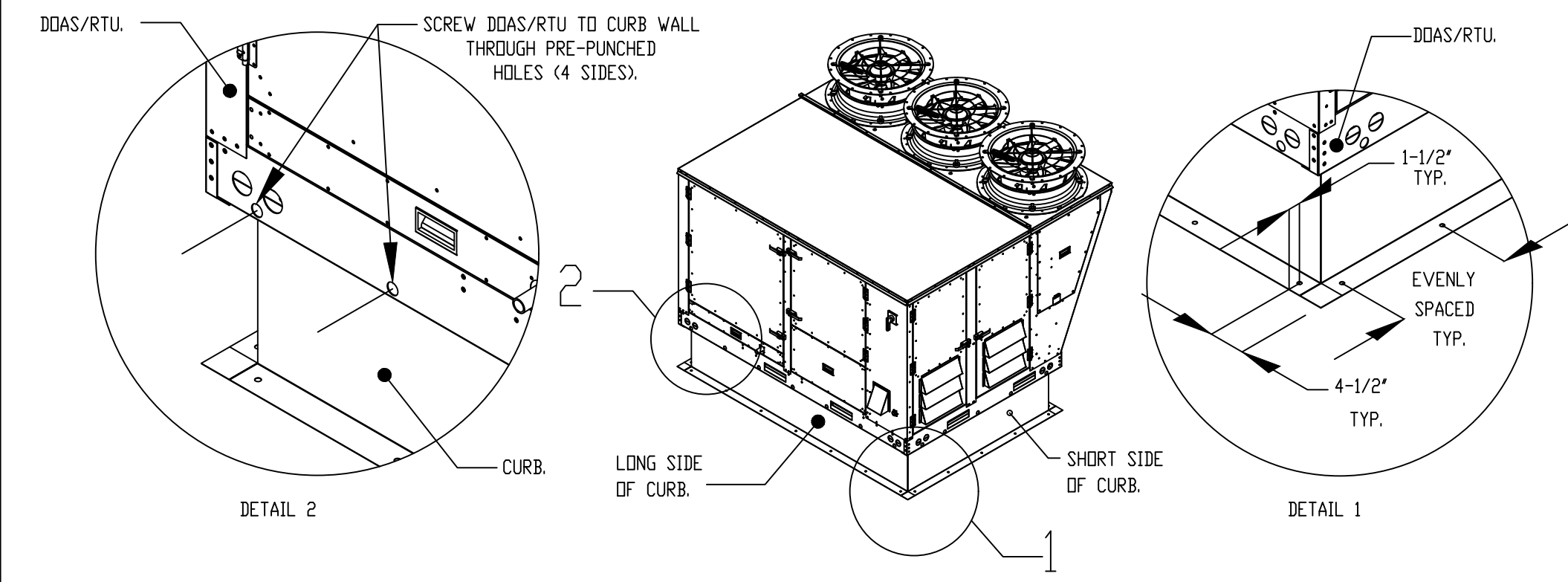


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TYPICAL DOAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

1. SECURE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW. USING 3/8" X 2" ZINC PLATED STEEL LAG BOLTS, AND ZINC PLATED WASHERS. SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF (5) LAG BOLTS ON EACH SHORT SIDE, AND (7) LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
2. SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4" X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.



HOODS 201 PERFORMANCE GUARENTEE:

CAPTIVEAIRE ENSURES THE PERFORMANCE OF THIS VENTILATION SYSTEM ONLY IF THE EXHAUST AIR VOLUMES ARE CORRECT, THE MAKE-UP AIR VOLUMES ARE CORRECT, AND THE MAKE-UP AIR IS DELIVERED CORRECTLY INTO THE SPACE.

EXHAUST GUIDELINES:

1. THE VOLUME OF AIR EXHAUSTED BY THE VENTILATION SYSTEM IS PER PLAN.
2. THERE ARE NO EXHAUST OUTLETS IN THE KITCHEN SPACE, BESIDES THE KITCHEN HOOD.

MAKE-UP AIR GUIDELINES:

1. ONLY DOUBLE WALLED LAMINAR DIFFUSERS USED IN SPACE (DI-PSP).
2. ALL DIFFUSERS SHALL BE A MINIMUM OF 10 FEET FROM THE HOOD.
3. THE MAKE-UP AIR PERCENTAGE THROUGH DDAS SHALL BE A MIN OF 100% THE EXHAUST VOLUME.
4. ALL SUPPLY AIR SHALL BE PROVIDED THROUGH DDAS UNIT.

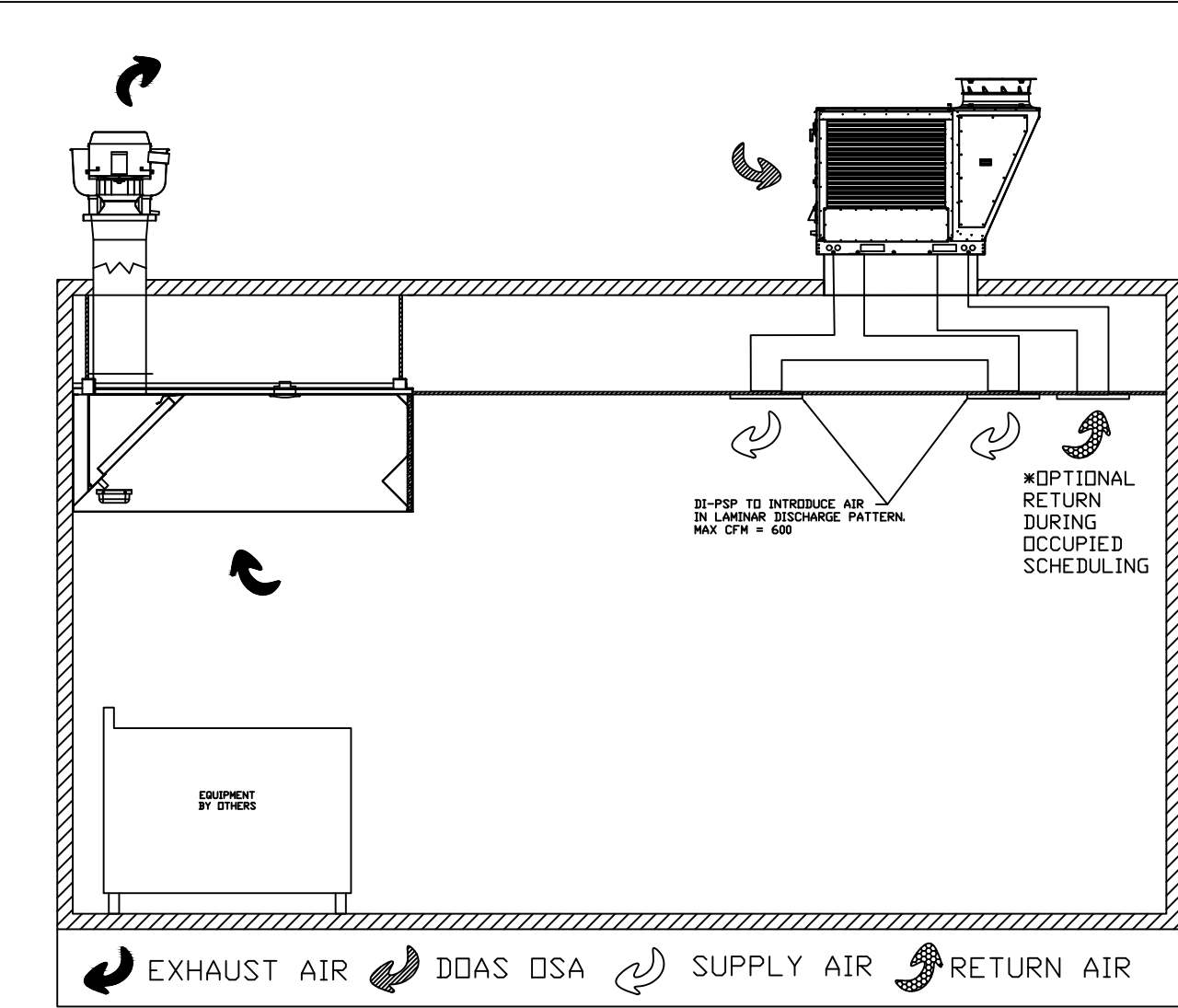
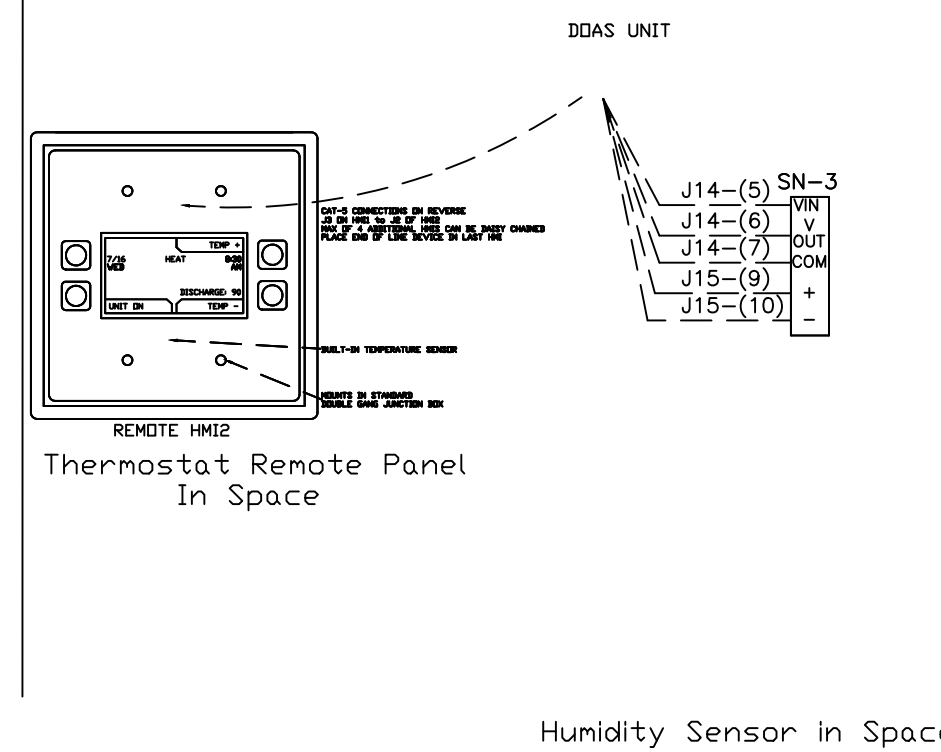
CAPTIVEAIRE ENSURES THE PERFORMANCE OF THIS VENTILATION SYSTEM AND THE COMFORT OF THE USERS ONLY IF THE EXHAUST AIR VOLUMES ARE CORRECT, THE MAKE-UP AIR VOLUMES ARE CORRECT, AND THE MAKE-UP AIR IS DELIVERED CORRECTLY INTO THE SPACE.

FOLLOWING THESE GUIDELINES WILL RESULT IN PROPER CAPTURE AND CONTAINMENT OF THE EXHAUST SYSTEM. IF THE JOBSITE CANNOT ACCOMMODATE THE GUIDELINES ABOVE PLEASE CONTACT SALES OFFICE FOR ALTERNATE DESIGN.

INTERLOCK WIRING BETWEEN DDAS AND DCV CONTROL PANEL

DDAS Terminals	DCV Terminals
J11-(7)	SF01
J16-(7)	SF01
J16-(1)	VD+
J16-(3)	VD-

THERMOSTAT REMOTE PANEL WIRING FROM DDAS TO CONDITIONED SPACE



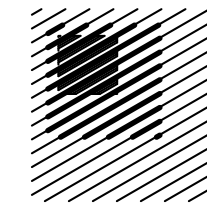
SEQUENCE OF OPERATIONS:

1. WHILE HOODS ARE ON, TOTAL HOOD EXHAUST TO MODULATE BETWEEN 3000-3875 CFM BASED ON COOKING TEMPERATURE IN THE HOOD. DDAS-1 TO OPERATE IN 100% OA AND MODULATE SUPPLY FAN BETWEEN 3000-3875 CFM PROPORTIONALLY WITH THE EXHAUST FANS. SPACE THERMOSTAT PROVIDED WITH DDAS-1 TO BE SET TO MAINTAIN SPACE SETPOINTS OF 70F AT 50% RH IN SUMMER AND 68F IN WINTER.
2. WHILE HOOD IS OFF, HOOD CONTROLS TO SEND DDAS-1 INTO UNOCCUPIED MODE. DDAS-1 TO OPERATE AT 3750 CFM AT 10% OA AND CYCLE THE SUPPLY FAN ON UPON A CALL FOR HEATING, COOLING, OR DEHUMIDIFICATION IN THE SPACE. UNOCCUPIED SPACE SETPOINT TO BE SET TO MAINTAIN 75F AT 50% RH IN SUMMER AND 65F IN WINTER.

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PRIME DESIGN SYSTEMS, INC.
 ARCHITECTURE INTERIORS GRAPHICS
 2397 OLD KENT ROAD WARREN, MICHIGAN 48091
 586-427-4995
 586-758-5160
 E-MAIL: PDS@PDSINC.COM

PROPOSED RESTAURANT TENANT SPACE
 YUMM
 3565 AUBURN ROAD AUBURN HILLS, MICHIGAN 48326
 PROJECT MECHANICAL DETAILS
 DATE 01/13/2021 45% Review
 REVISIONS

SHEET
 M02.03

ROOF TOP UNIT SCHEDULE																														
MARK	MANUFACTURER	MODEL NUMBER	AREA SERVED	SUPPLY FAN SECTION				MOTOR DATA		FILTER SECTION			HEATING SECTION				EVAPORATOR SECTION BASED ON 95°F AMBIENT				ELECTRICAL			OPERATING WEIGHT (LBS.)	ACCESSORIES					
				CFM	MIN. O.A. CFM	E.S.P. IN. WG.	FAN RPM	MAX BHP	# FANS	TYPE	SIZE	MERV	INPUT MBH	OUTPUT MBH	E.A.T. (°F)	L.A.T. (°F)	NOMINAL TONS	IEER	E.A.T. (°F)		L.A.T. (°F)		VOLTS PHASE			MCA	MOP			
																			D.B.	W.B.	D.B.	W.B.								
(E)RTU	CARRIER	48TCED14	EXISTING SEATING	3,000	700									224/ 180	179/ 144															1.2,3,4,5,6,7,8,9,10,11,12,13,14,15

(APPROVED EQUAL: NONE)

ACCESSORIES:

-

DOAS/ RTU FAN SCHEDULE																									
FAN SCHEDULE															HEATING SCHEDULE										
MARK	DOAS/RTU MODEL #	MANUFACTURER	BLOWER	MAX OUTSIDE AIR CFM	TOTAL CFM	ESP	HP	BHP	Ø	VOLT	MCA	MOCP	WEIGHT (LBS)	INPUT BTUs	OUTPUT BTUs	TEMP RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE	BURNER EFFICIENCY(%)						
DOAS-1	CASRTU3-1.500-20-20T-DOAS	CAPTIVEAIRE	20P-3	4210	4210	1.000	7.500	3.525	3	208	95.1A	110A	2588	497338	397870	80°F	7 IN. W.C. - 14 IN. W.C.	NATURAL	80						
COOLING SCHEDULE																									
COMPRESSOR			OUTDOOR FAN				INDOOR COIL		OUTSIDE AIR DB TEMP	OUTSIDE AIR WB TEMP	MIXED AIR DB TEMP	MIXED AIR WB TEMP	LEAVING DB TEMP	LEAVING WB TEMP	LEAVING DP TEMP	TOTAL CAPACITY	SENSIBLE CAPACITY	LATENT CAPACITY	REHEAT LEAVING DB TEMP	REHEAT LEAVING WB TEMP	DESIRED REHEAT CAPACITY	MAX REHEAT CAPACITY	REHEAT LEAVING RELATIVE HUMIDITY	MOISTURE REMOVAL RATE	IEER
TONNAGE	VOLTAGE	Ø	MOTOR VOLTAGE	MOTOR Ø	MOTOR FREQUENCY	MOTOR QTY	ROWS	FACE AREA																	
20	190-240	3	200-240	3	60	3	7	11.9 SQFT	80.3°F	75.1°F	80.3°F	75.1°F	57.0°F	56.4°F	56.1°F	264.0 MBH	102.4 MBH	161.6 MBH	70.0°F	63.3°F	59.1 MBH	129.6 MBH	70	146.0 LBS/HR	18.2

NOTES:

- SINGLE POINT ELECTRICAL CONNECTION FOR RTU. QNTY 1 750VA TRANSFORMER USED. IF A NON-DCV PREWIRE CONTROLS THIS UNIT, THE #28, #47, "MA", OR "E2" OPTION PREWIRE MUST BE SELECTED. DO NOT PROVIDE SUPPLY STARTER IN PREWIRE.
- CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED. DOWN DISCHARGE.
- 2" MERV 13 FILTERS. QTY 4.
- 2" MERV 8 FILTERS. QTY 4.
- OVERHEAT STAT. VFD FACTORY MOUNTED AND WIRED IN COMMERCIAL CONTROL VESTIBULE FOR RTU.
- INLET PRESSURE GAUGE, 0-35".
- MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE.
- CURB DUCT HANGER.
- 20 TON MODULATING COOLING OPTION, 208/230V. R410A REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FAN(S).
- 20 TON MODULATING REHEAT OPTION. SPACE RELATIVE HUMIDITY CONTROL.
- CLOGGED FILTER SWITCH WITH NOTIFICATION ON HMI.
- RTU MANUAL INTAKE/RETURN DAMPER CONTROL VIA HMI.
- DOWN RETURN.
- VAV PACKAGE W/ MANUAL/DDC CONTROL (571 VFD INCLUDED).
- UNIT MOUNTED R.A. DUCT SMOKE DETECTOR WITH REMOTE TEST/ANNUNCIATOR STATION.

GRILLES REGISTERS AND DIFFUSERS SCHEDULE									
MARK	MANUFACTURER	MODEL NUMBER	NECK SIZE	DIFFUSER SIZE	FINISH	MOUNTING TYPE	CONSTRUCTION	ACCESSORY	L
CD-1	PRICE	6" / ARCD / B12	6" Ø	13.5" Ø	WHITE	SEE PLANS	ALUMINUM	ROUND NECK O.B.D.	1
CD-2	PRICE	8" / ARCD / B12	8" Ø	18" Ø	WHITE	SEE PLANS	ALUMINUM	ROUND NECK O.B.D.	1
CD-3	PRICE	8" / 24"x24" / SPD / 31 / B12	8" Ø	24"x24"	WHITE	LAY-IN	STEEL	ROUND NECK O.B.D.	1
CD-4	PRICE	10" / 24"x24" / PDN / 31 / B12	10" Ø	24"x24"	WHITE	LAY-IN	STEEL	ROUND NECK O.B.D.	1
RG-1	PRICE	24"x24" 80 / F / A / B12	14" Ø	24"x24"	WHITE	LAY-IN	ALUMINUM	-	1
RG-2									
EG-1	PRICE	6"x6" / 635 DAL / F / L / A / B12	6" Ø	7.75"x7.75"	WHITE	DUCT	ALUMINUM	ALUMINUM DAMPER	1
TAG-1	PRICE	14"x8" 630 F/L/A/B12	14"x8"	15.75"x9.75"	WHITE	SURFACE	ALUMINUM	-	1
TAG-2	PRICE	24"x24" 80 / F / A / B12	12" Ø	24"x24"	WHITE	LAY-IN	ALUMINUM		
TAG-3									

(APPROVED EQUAL: NONE)

NOTES:

- PROVIDE ALL ACCESSORIES NEEDED TO PROPERLY MOUNT DEVICES.

ELECTRIC UNIT HEATER SCHEDULE													
MARK	MANUFACTURER	MODEL NUMBER	AREA SERVES	UNIT DIMENSIONS (H" x W" x D")	MOUNTING TYPE	FRAME & GRILLE MATERIAL	COLOR	KW	HEAT OUTPUT (BTUH)	VOLTAGE	PHASE	AMPS	NOTES
EUH-1	MARKEL	Y3485	VESTIBULE 100	23-1/16"SQx9-1/8"D	SURFACE	STEEL	WHITE	5	17,065	208	3	13.9	1, 2, 3, 4, 5

(APPROVED EQUAL: NONE)

NOTES:

- U.L. LISTED
- FACTORY MOUNTED DISCONNECT SWITCH.
- BUILT-IN 2-STAGE THERMOSTAT.
- DISCONNECT BY ELECTRICAL CONTRACTOR.
- PROVIDE ACCESSORIES REQUIRED FOR FULLY RECESSED INSTALLATION.

EXHAUST FAN SCHEDULE												
MARK	MANUFACTURER	MODEL NUMBER	AREA SERVED	LOCATION	AIRFLOW (CFM)	EXTERNAL S.P.	FAN (RPM)	FAN (BHP)	FAN (HP)	SONES	ELECTRICAL	NOTES
KEF-1	CAPTIVEAIRE	DU180HFA	HOOD #1	ROOF	2250	1.0	1045	0.78	1.5	12	208V / 3PH	1, 3, 5, 9, 10, 12, 13
KEF-2	CAPTIVEAIRE	DU85HFA	HOOD #2	ROOF	1330	1.0	1243	0.336	1	10.5	115V / 1PH	1, 3, 5, 9, 10, 12, 13
KEF-3	CAPTIVEAIRE	DU50HFA	HOOD #3	ROOF	1330	0.5	1243	0.336	1	10.5	115V / 1PH	1, 3, 5, 9, 10, 12, 13
EF-1	GREENHECK	CUE-095-VG	TOILET ROOMS	ROOF	300	0.3	1161	0.05	1 / 6		115V/1PH	1, 2, 3, 4, 6, 8

(APPROVED EQUAL: GREENHECK, ACME, COOK, PENN, TWIN CITY, RUPP AIR)

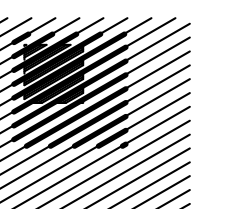
NOTES:

- FAN SHALL HAVE AMCA SEAL & BE U.L. CERTIFIED.
- FAN SHALL HAVE ALUMINUM BIRD SCREEN.
- SAFETY DISCONNECT SWITCH.
- PROVIDE DUCT MOUNTED GRAVITY BACKDRAFT DAMPER.
- U.L. 762 LISTED
- 18" ROOF CURB
- ECM MOTOR WITH POTENTIOMETER DIAL.
- FAN CONTROLLED BY TIME CLOCK.
- GREASE CUP
- 20" VENTED CURB
- U.L. 705
- VARIABLE SPEED CONTROL
- INTERLOCK TO DOAS-1

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OUTDOOR AIR CALCULATION SCHEDULE												
UNIT	ROOM NAME & ROOM NUMBER	AREA SQ. FT. (Az)	MMC CLASSIFICATION	AREA OUTDOOR AIR RATE PER MMC TABLE 403.3 (Ra) CFM/SQ. FT.	AREA OUTDOOR AIR (Ra*Az) CFM	ZONE POPULATION PEOPLE (TOTAL SEATS)	PEOPLE OUTDOOR AIR RATE PER MMC TABLE 403.3 (Rp) CFM/PERSON	OCCUPANT OUTDOOR AIR (RpPz) CFM	BREATHING ZONE OUTDOOR AIR (Vbz=RpPz+RaAz) CFM	ZONE AIR DISTRIBUTION EFFECTIVENESS PER MMC TABLE 403.3 (Ez)	ZONE OUTDOOR AIR REQUIRED MMC TABLE 403.3 (Voz=Vbz/Ez) CFM	TOTAL OUTDOOR AIR REQUIRED WITHIN ZONE CFM
DOAS-1	KITCHEN	726	KITCHEN	0.7 PER FT2	0.7 CFM/FT2 EXHAUST = 510 CFM REQUIRED							750
	SERVING	164	KITCHEN	0.7 PER FT2	0.7 CFM/FT2 EXHAUST = 115 CFM REQUIRED							
	DISHWASH	183	KITCHEN	0.7 PER FT2	0.7 CFM/FT2 EXHAUST = 128 CFM REQUIRED							
RTU-1	WALK UP	142	LOBBY	0.06	9	5	5	25.0	33.5	0.8	41.9	692
	CORRIDOR	631	CORRIDOR	0.06	38	0	0	0.0	37.9	0.8	47.3	
	SEATING	571	DINING	0.18	103	43	7.5	322.5	425.3	0.8	531.6	
	OFFICE	160	OFFICE	0.06	10	2	5	10.0	19.6	0.8	24.5	
	STORAGE	268	STORAGE	0.12	32	0	0	0.0	32.2	0.8	40.2	
	VESTIBULE	80	OFFICE	0.06	5	0	0	0.0	4.8	0.8	6.0	
	MEN'S ROOM	68	TOILET ROOM		70 CFM EXHAUST PER WATER CLOSET OR URINAL EXHAUST = 70 CFM REQUIRED							
WOMEN'S ROOM	68	TOILET ROOM		70 CFM EXHAUST PER WATER CLOSET EXHAUST = 70 CFM REQUIRED								

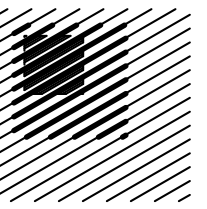
PER THE 2015 INTERNATIONAL MECHANICAL CODE TABLE 403.3.1.1 THE SPACES WITHIN THIS SCHEDULE MEET OR EXCEED THE REQUIREMENTS FOR OUTDOOR AIR FLOW RATE.

DUCTWORK APPLICATION SCHEDULE		
AIR SYSTEM	MATERIAL	DESIGN PRESSURE CLASSIFICATION (INCHED, WG)
SUPPLY AIR IN AN UNCONDITIONED SPACE	GALVANIZED STEEL, R-3.5 DUCT WRAP WITH VAPOR BARRIER	+ 2
SUPPLY AIR DUCTWORK INSTALLED WITHIN A RETURN AIR PLENUM	GALVANIZED STEEL	+ 2
EXHAUST AIR DUCTWORK	GALVANIZED STEEL	- 2
RETURN AIR DUCTWORK	GALVANIZED STEEL	- 2
LINED RETURN AIR DUCTWORK	GALVANIZED STEEL WITH 2" DUCT LINER	- 2
KITCHEN HOOD EXHAUST DUCTWORK	PROVIDE PRE-FABRICATED ROUND GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. PROVIDE ACCESS DOORS & SLOPE DUCTWORK PER NFPA96 & 2015 MMC	
DISHWASHER HOOD EXHAUST	ALUMINUM OR STAINLESS STEEL SLOPE DUCTWORK BACK TO HOOD @ 1/4" PER FOOT	- 2

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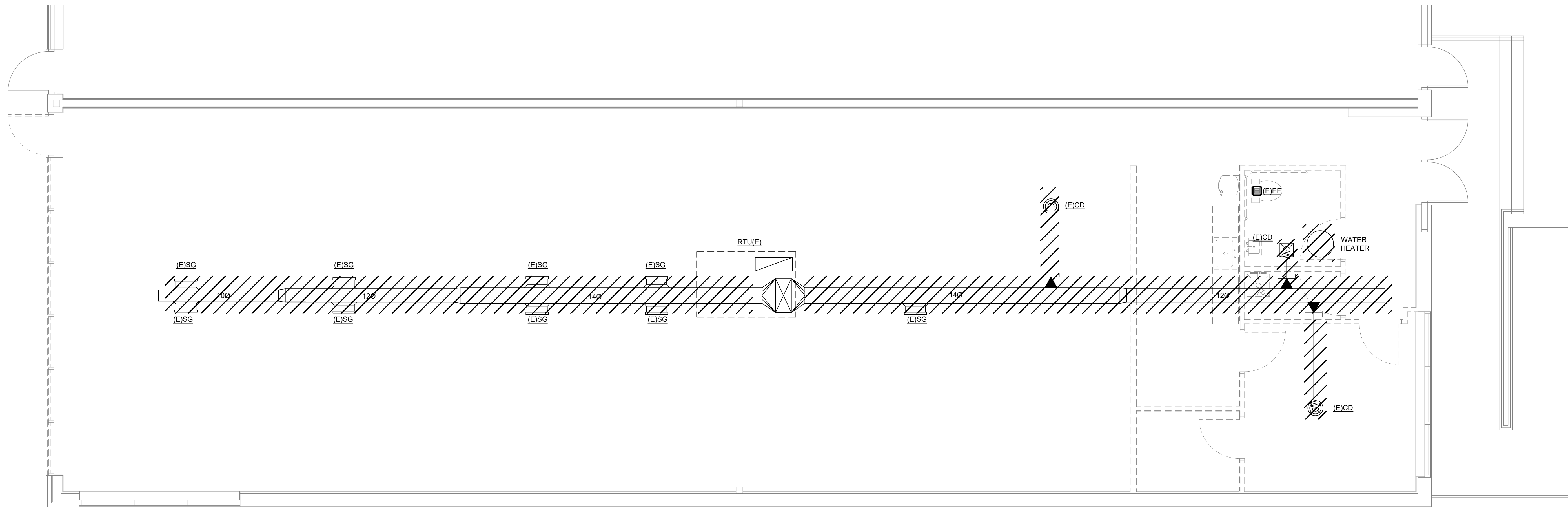
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PRIME DESIGN SYSTEMS, INC.
ARCHITECTURE INTERIORS PLANNING GRAPHICS
2397 OLD KENT ROAD WARREN, MICHIGAN 48091 586-427-4995
FAX 586-758-5160 E-MAIL PDS@PDSINC.COM

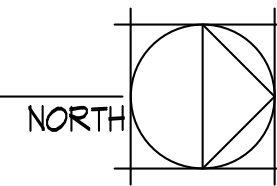
PROPOSED RESTAURANT TENANT SPACE
YUMM
3565 AUBURN ROAD AUBURN HILLS, MICHIGAN 48326
MECHANICAL DETAILS
PROJECT 17/508
DATE 07/13/2021 45% Review
REVISIONS

SHEET M03.02



FLOOR PLAN - DEMOLITION

SCALE: 1/4" = 1'-0"



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