City of Portland, Oregon - Bureau of Development Services

1900 SW Fourth Avenue · Portland, Oregon 97201 | 503-823-7300 | www.portland.gov/bds

Permit Revision Submittal Requirements and Application

A Permit Revision is required when there are proposed changes to the project after the permit has been issued. This may arise due to discrepancies between the city-approved permit drawings and actual field conditions, or the customer has changed their mind about an aspect of the project. In all cases, a revision to the existing permit must be submitted, reviewed and approved.

Minimum Submittal Requirements (check all boxes and sign below):

- ☐ A copy of this application.
- ☐ One PDF copy of plans for electronic submittals or three copies for paper submittals.
- ☐ All plans must clearly reflect the proposed change(s). Changes must be bubbled.
- ☐ Drawings and calculations must be stamped and signed by the Architect and/or the Engineer of Record, if applicable.
- ☐ Project narrative for extensive revisions.
- ☐ One PDF copy of calculations and other supporting documents for electronic submittals or two copies for paper submittals.
- ☐ Copy of Inspector's correction notice, if the revision is due to an inspection correction. One PDF copy for electronic submittals and two copies for paper submittals.

Applicant Information:

Applicant Name: Dree Hayden

Street Address: 351 Nw 12th Ave — City/State/ZIP: Portland, Or 97209

Email: d.hayden@alliant-systems.com — Phone: 9712171747

Value of Proposed Revision: $0.00 — Issued Permit #: IVR#:4706171

Job Site Address: 18440 Ne Portal Way — City/State/ZIP: Portland, Or 97230

Description of Revision: add mechanical plans to issued MT permit - 21-055455-MT

Applicant Signature: _____ Date: 7.19.21

Fees:

An invoice with permit fees will be sent to the applicant once minimum submittal requirements have been verified. Permit Revisions are subject to fees associated with plan review, processing and any increase in project value.

The Bureau of Development Services fee schedule is on the BDS web site: www.portlandoregon.gov/bds/article/102792

Helpful Information:

Bureau of Development Services |City of Portland, Oregon
1900 SW 4th Avenue, Portland, OR 97201
For Hours Call 503-823-7310 or visit www.portlandoregon.gov/bds

Important Telephone Numbers:

BDS main number	503-823-7300
DSC automated information line	503-823-7310
Building code information	503-823-1456
BDS 24-hour inspection request line	503-823-7000
Residential information for one- and two-family dwelling	503-823-7388
General Permit Processing and Fee Estimate info	503-823-7357
Zoning Information Line	503-823-7526
City of Portland TTY	503-823-6868

HYDRONIC PIPING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
HWS	HWS	HEATING WATER SUPPLY
HWR	HWR	HEATING WATER RETURN
CNDS	CNDS	INDIRECT CONDENSATE DRAIN
CHWS	CHWS	CHILLED WATER SUPPLY
CHWR	CHWR	CHILLED WATER RETURN
NG	NG	GAS PIPING LOW PRESSURE
IND	IND	INDIRECT DRAIN
NG	G	GAS PIPING HIGH PRESSURE
HPS	HPS	HIGH PRESSURE STEAM
MPS	MPS	MEDIUM PRESSURE STEAM
LPS	LPS	LOW PRESSURE STEAM

GENERAL SYMBOL LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
		SECTION TAG
		DETAIL TAG
#		NOTE BY SYMBOL
#		DEMOLITION NOTE BY SYMBOL
#		REVISION DELTA
	POC	POINT OF CONNECTION
#		EQUIPMENT TAG
		DEMOLITION
		RELOCATE

CONTROLS / ALARM LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
CO2	CO2	CARBON DIOXIDE SENSOR
H	H'STAT	HYDROMETER / HUMIDITY SENSOR
T	T'STAT	THERMOSTAT / TEMP SENSOR
TW	T'STAT	THERMOSTAT WIRELESS
TP	T'STAT	THERMOSTAT PENDANT MOUNT
CO	CO	CARBON MONOXIDE SENSOR
S		WALL SWITCH / SPEED CONTROL
CP		WALL MOUNTED CONTROL PANEL
SD		DUCT MOUNTED SMOKE DETECTOR
SP		DUCT MOUNTED STATIC PRESSURE SENSOR
1 2 3	FSD	1½ & 3 HOUR COMBINATION FIRE SMOKE DAMPER

PIPING SYMBOL LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
AAV	AAV	AUTOMATIC AIR VENT
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
	ST	F&T STEAM TRAP
MAV	MAV	MANUAL AIR VENT
		PIPE ANCHOR
		PIPE GUIDE
	UN	PIPE UNION
		FLEXIBLE JOINT
		FLEXIBLE PIPE CONNECTOR
		FLOW ARROW, DIRECTION OF FLOW
PT		PRESSURE/TEMPERATURE TEST PLUG
		PUMP
P	PS	PRESSURE SWITCH OR PRESSURE SENSOR
RPBP	RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR
SLOPE		SLOPE PIPE DOWN IN DIRECTION OF ARROW
	STN	STRAINER
		STRAINER W/ BLOWDOWN VALVE
VB	VB	VACUUM BREAKER
		WALL TYPE INDICATOR ASSEMBLY
F		WATER FLOW DETECTOR
		WATER HAMMER ARRESTOR
		VERTICAL PIPE DROP OR RISER
		PIPE TAKE OFF - UP
		PIPE TAKE OFF - DOWN
		90 DEGREE ELBOW UP
		90 DEGREE ELBOW DOWN
		TEE UP
		TEE DOWN
		BREAK IN LINE - SHOWN FOR CLARITY
		PIPE CAP

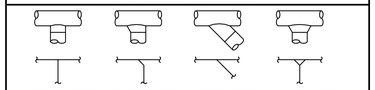
VALVES & GAUGES

SYMBOL	ABBREVIATION	DESCRIPTION
		AUTOMATIC FLOW CONTROL VALVE
		AUTOMATIC TWO-WAY VALVE
		AUTOMATIC THREE-WAY VALVE
		BALL CHECK OR DRIP VALVE
	BV	BALL VALVE
	BALV	BALANCING VALVE
	BFV	BUTTERFLY VALVE
	CV	CHECK VALVE
	RV	RELIEF VALVE
	TPV	PRESSURE -TEMPERATURE RELIEF VALVE
	PRV	PRESSURE REDUCING VALVE
	PV	PLUG VALVE
	OS&Y	OUTSIDE SCREW AND YOKE VALVE
	GC	GAS COCK
	GV	GATE VALVE
	GLV	GLOBE VALVE
		HOSE END DRAIN VALVE
	FCV	FLOW CONTROL VALVE
DDCV	DDCV	DOUBLE DETECTOR CHECK VALVE
		THERMOMETER
		PRESSURE GAUGE WITH GAUGE COCK
		FLOW MEASURING DEVICE

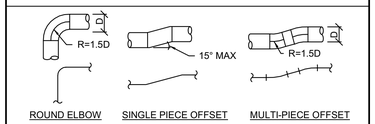
HVAC DUCT LEGEND

DUCT UP	DUCT DOWN	DESCRIPTION
		RECTANGULAR SUPPLY
		ROUND SUPPLY
		RECTANGULAR RETURN
		ROUND RETURN
		RECTANGULAR EXHAUST
		ROUND EXHAUST
		RECTANGULAR OUTSIDE AIR
		ROUND OUTSIDE AIR
2-LINE	**1-LINE**	**DESCRIPTION**
12/10 W	12/10 W	RECTANGULAR DUCT INSULATION WRAP
12Ø W	12Ø W	ROUND DUCT INSULATION WRAP
12/10 SLSM	12/10 SLSM	RECTANGULAR DUCT SOUND LINED WRAP
12/10 K-27	12/10 K-27	RECTANGULAR DUCT K-27 SOUND INSULATED
12Ø K-27	12Ø K-27	ROUND DUCT K-27 SOUND INSULATED
12Ø		FLEX DUCTWORK

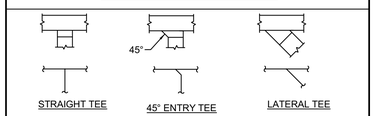
HVAC DUCT DETAILS



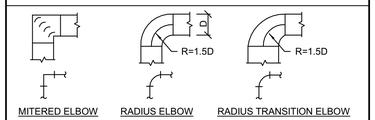
ROUND BRANCH FITTINGS



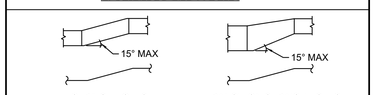
ROUND ELBOWS AND OFFSETS



RECTANGULAR BRANCH FITTINGS



RECTANGULAR ELBOWS



RECTANGULAR OFFSETS

DEFERRED SUBMITTAL - SEISMIC ANALYSIS

THE FOLLOWING ITEMS ARE PROPOSED TO BE COMPLETED, DOCUMENTED, AND SUBMITTED FOR REVIEW TO CODE AUTHORITIES AS A DEFERRED SUBMITTALS:

1. STRUCTURAL ANALYSIS AND CONSTRUCTION DETAILING FOR HVAC COMPONENT SUPPORT/ANCHORAGE AND SEISMIC RESTRAINT

   MINIMUM MECHANICAL ITEMS SUBJECT TO SEISMIC ANALYSIS/DETAILING TO INCLUDE THE FOLLOWING:
   - ALL GRADE OR ROOF MOUNTED EQUIPMENT >400 LBS
   - ALL SUSPENDED COMPONENTS OR EQUIPMENT >75 LBS
   - ALL SUSPENDED DUCT W/ > 6 SF CROSS SECTION
   - TYPE-1 GREASE EXHAUST DUCTWORK SYSTEMS

HVAC GENERAL NOTES - STATE OF OREGON

1. THESE PLANS ARE SCHEMATIC AND DO NOT SHOW EXACT ROUTING OR EVERY OFFSET WHICH MAY BE REQUIRED. THE HVAC CONTRACTOR IS TO COORDINATE WITH ALL OTHER TRADES AND IS TO VERIFY ALL CLEARANCES BEFORE COMMENCING WORK.
2. MATERIALS, METHODS, AND INSTALLATION SHALL COMPLY WITH THE PROVISIONS OF THE MOST RECENTLY ADOPTED VERSIONS OF -
   - THE 2019 OREGON MECHANICAL SPECIALTY CODE (2018 IMC W/ STATE OF OREGON AMENDMENTS)
   - THE 2019 STATE OF OREGON STRUCTURAL SPECIALTY CODE (2018 IBC W/ STATE OF OREGON AMENDMENTS)
   - THE 2019 STATE OF OREGON ZERO ENERGY READY COMMERCIAL CODE (OZERCC) (ASHRAE 90.1 - 2016 OR 2018 IECC)
   - THE 2019 INTERNATIONAL FIRE CODE AND ALL OTHER APPLICABLE LOCAL CODES, AMENDMENTS, AND ORDINANCES.
3. DUCT CONSTRUCTION AND HANGING SHALL COMPLY WITH CHAPTER 6 OF THE OMSC AND WITH CURRENT SMACNA STANDARDS. EARTHQUAKE BRACE ALL DUCTS 28" DIA AND LARGER WHICH ARE SUSPENDED MORE THAN 12" BELOW STRUCTURAL SYSTEM.
4. DUCTS SHALL BE INSULATED AS INDICATED ON PLANS, OR AS OTHERWISE REQUIRED BY THE OZERCC .
   - DUCT WRAP, WHERE INDICATED, SHALL BE 2-3/16" 0.75 LB/CU FT FIBERGLASS DUCT INSULATION WITH A FACTORY APPLIED REINFORCED ALUMINUM FOIL VAPOR BARRIER.
5. FLEXIBLE DUCT SHALL BE A MANUFACTURED ASSEMBLY INCLUDING: REINFORCED EXTERIOR VAPOR BARRIER, MINIMUM R-6 FIBERGLASS INSULATION, NON-PERFORATED INTERIOR LINER, AND STRUCTURAL WIRE HELIX. ASSEMBLY SHALL BE CERTIFIED AS A UL 181 LISTED, CLASS-1 AIR DUCT. FLEXIBLE DUCT SHALL BE FULLY SUPPORTED, AND SHALL ONLY BE USED WHERE SHOWN. LENGTH OF FLEX DUCT SHALL NOT EXCEED 8' UNLESS NOTED OTHERWISE.
6. PROVIDE EARTHQUAKE RESTRAINT FOR HVAC EQUIPMENT IN ACCORDANCE WITH OSSC CHAPTER 16 AND ASCE 7-16.
7. PROVIDE FIRE DAMPERS AND/OR FIRE/SMOKE DAMPERS WHERE INDICATED ON PLANS AND AS REQUIRED BY SECTION 717 OF THE OSSC. INSTALL FIRE DAMPERS AND FIRE/SMOKE DAMPERS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, THE TERMS OF THEIR LISTINGS, AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING, MECHANICAL, AND FIRE CODES AND ORDINANCES.
8. PIPING PENETRATIONS OF FIRE RATED WALLS OR FLOORS SHALL BE SLEEVED AND FIRE STOPPED WITH LISTED MATERIALS SO AS TO MAINTAIN THE INTEGRITY AND RATING OF THE FLOOR OR WALL.
9. PROVIDE RETURN DUCT SMOKE DETECTOR CONFIGURED TO PROVIDE AUTOMATIC SHUT DOWN OF ALL HEATING, COOLING, OR VENTILATION EQUIPMENT DELIVERING IN EXCESS OF 2000 CFM IN ACCORDANCE WITH SECTION 606 OF THE OMSC. POWER WIRING AND INTERLOCK WIRING WITH THE BUILDING FIRE ALARM SYSTEM SHALL BE BY THE ELECTRICAL CONTRACTOR.
10. HVAC EQUIPMENT, VALVES AND DAMPERS SHALL BE LOCATED IN EASILY ACCESSIBLE LOCATIONS. ACCESS PANELS REQUIRED FOR MECHANICAL EQUIPMENT SHALL BE IDENTIFIED AND LOCATED BY THE MECHANICAL CONTRACTOR FOR ULTIMATE INCLUSION IN ARCHITECTURAL DRAWINGS. ACCESS PANELS SHALL BE PROVIDED AND INSTALLED BY THE WALL-CEILING CONTRACTOR PER SPECIFICATIONS.
11. HVAC TEMPERATURE SET POINTS, DEAD BANDS, AND SCHEDULES SHALL BE PROGRAMMED TO MEET SECTION 6.4.3 OF ASHRAE 90.1 - 2016
12. ALL WIRING EXPOSED WITHIN A PLENUM SHALL MEET THE REQUIREMENTS IN SECTION 602.2.1.1 OF THE OMSC. ALL COMBUSTIBLE ELECTRICAL EQUIPMENT EXPOSED WITHIN A PLENUM SHALL MEET THE REQUIREMENTS IN SECTION 602.2.1.4 OF THE OMSC.

GENERAL ABBREVIATIONS

ABBV	FULL NAME	ABBV	FULL NAME	ABBV	FULL NAME
ADJ	ADJUSTABLE	GAL	GALLONS	OD	OUTSIDE DIMENSION
AFF	ABOVE FINISHED FLOOR	GALV	GALVANIZED	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
AL	ALUMINUM	GC	GENERAL CONTRACTOR		
ALT	ALTERNATE	GPH	GALLONS PER HOUR	PSI	PRESSURE PER SQUARE INCH
AP	ACCESS PANEL	GPM	GALLONS PER MINUTE	PSIA	PRESSURE PER SQUARE INCH ABSOLUTE
AVG	AVERAGE	GWB	GYPSUM WALL BOARD		
BAS	BUILDING AUTOMATION SYSTEM	HP	HORSE POWER	PSIG	PRESSURE PER SQUARE INCH GAGE
BOTT	BOTTOM	HR	HOUR	QTY	QUANTITY
BTU	BRITISH THERMAL UNITS	HTG	HEATING	R	RELOCATE
BTUH	BRITISH THERMAL UNITS PER HOUR	HZ	HERTZ	RE	REMOVE
CAP	CAPACITY	ID	INSIDE DIMENSION	REQ'D	REQUIRED
CFH	CUBIC FEET PER HOUR	IN	INCHES	RPM	REVOLUTIONS PER MINUTE
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	I/O	INPUT / OUTPUT	SQ	SQUARE
		KW	KILOWATT	STL	STEEL
CFM	CUBIC FEET PER MINUTE	LBS	POUNDS	SSTL	STAINLESS STEEL
CLG	CEILING	MAX	MAXIMUM	SUSP	SUSPENDED
CONN	CONNECTION	MCA	MINIMUM CIRCUIT AMPACITY	TD	TEMPERATURE DIFFERENTIAL
CP	CONTROLS PANEL	MFR	MANUFACTURER	TEMP	TEMPERATURE
DIA	DIAMETER	MISC	MISCELLANEOUS	TYP	TYPICAL
DN	DOWN	MISC	MISCELLANEOUS	UNO	UNLESS NOTED OTHERWISE
E	EXISTING	MIN	MINIMUM	V	VOLT(S)
EFF	EFFICIENCY	MT	MOUNT	VEL	VELOCITY
ELEV	ELEVATION	MISC	MISCELLANEOUS	W	WATT(S)
EXST	EXISTING	MIN	MINIMUM	Ø	VOLTAGE PHASE & DUCT DIAMETER
F	FAHRENHEIT	N	NEW		
FLA	FULL LOAD AMPS	NIC	NOT IN CONTRACT		
FLEX	FLEXIBLE	NOM	NOMINAL		
FPM	FEET PER MINUTE	NTS	NOT TO SCALE		
FUT	FUTURE				

HVAC ABBREVIATIONS

ABBV	FULL NAME	ABBV	FULL NAME	ABBV	FULL NAME
AC	AIR CONDITIONING UNIT	FD	FIRE DAMPER	RL	REFRIGERANT LIQUID
APD	AIR PRESSURE DROP	FOB	FLAT ON BOTTOM	RTU	ROOF TOP UNIT
BDD	BACKDRAFT DAMPER	FOT	FLAT ON TOP	SA	SUPPLY AIR
BOD	BOTTOM OF DUCT	FPB	FAN POWERED BOX	SAT	SUPPLY AIR TEMPERATURE
BSB	BRANCH SELECTOR BOX	FSD	FIRE SMOKE DAMPER	SEER	SEASONAL ENERGY EFFICIENCY RATIO
BWG	BOTTOM WALL GRILLE	GR	GRILLE	SL	SOUND LINING
BWR	BOTTOM WALL REGISTER	GRD	GRILLE/DIFFUSER	SM	SHEET METAL
COMB	COMBUSTION	HG	HOT GAS LINE	SP	STATIC PRESSURE
CNDS	CONDENSATE	HVAC	HEATING VENTILATION AND AIR CONDITIONING	SUC	SUCTION LINE
COND	CONDENSER			TOD	TOP OF DUCT
CU	CONDENSING UNIT	LAT	LEAVING AIR TEMPERATURE	TSP	TOTAL STATIC PRESSURE
DB	DUCT BOARD	LIQ	LIQUID INSIDE	TV	TURN VANES
DDC	DIRECT DIGITAL CONTROL	MD	MOTORIZED DAMPER	TWG	TOP WALL GRILLE
DIFF	DIFFUSER	MUA	MAKE-UP AIR	TWR	TOP WALL REGISTER
DMPR	DAMPER	NG	NATURAL GAS	UC	UNDER CUT
DX	DIRECT EXPANSION	OA	OUTSIDE AIR	UH	UNIT HEATER
EAT	ENTERING AIR TEMPERATURE	OAF	OUTSIDE AIR FAN	VAV	VARIABLE AIR VOLUME
EC	EGGCRATE	OBD	OPPOSED BLADE DAMPER	VD	VOLUME DAMPER
EER	ENERGY EFFICIENCY RATIO	PLBG	PLUMBING	VFD	VARIABLE FREQUENCY DRIVE
EF	EXHAUST FAN	RA	RETURN AIR	VRV	VARIABLE REFRIGERANT VOLUME
ESP	EXTERNAL STATIC PRESSURE	REG	REGISTER (GRILLE WITH DAMPER)	Ø	DUCT DIAMETER
EXH	EXHAUST	RH	RELATIVE HUMIDITY		

FITTING ABBREVIATIONS

ABBV	FULL NAME	ABBV	FULL NAME	ABBV	FULL NAME
A	COMPRESSED AIR LINE	EWT	ENTERING WATER TEMPERATURE	NC	NORMALLY CLOSED
CHWR	CHILLED WATER RETURN	HWR	HEATING WATER RETURN	NO	NORMALLY OPEN
CHWS	CHILLED WATER SUPPLY	HWS	HEATING WATER SUPPLY	TDV	TRIPLE DUTY VALVE
CWR	CONDENSER WATER RETURN	LWT	LEAVING WATER TEMPERATURE		
CWS	CONDENSER WATER SUPPL				

JOBSITE LOCATION

PROJECT SHEET INDEX

ALLIANT SYSTEMS

ALLIANT SYSTEMS, LLC
351 NW 12th AVE
PORTLAND, OR 97209
PHONE: 503/619-4000
FAX: 503/230-9238
WWW.ALLIANT-SYSTEMS.COM
CCB# 153420

REGISTERED PROFESSIONAL ENGINEER 64963PE OREGON 06/25/2000 SEAN C. MURRAY

EXPIRES 12-31-22

21-055455-REV-01-MT

REVISIONS: DATE

PORTLAND HOSPITAL
CLEAN ROOM RTU

18440 NE PORTAL WAY
PORTLAND, OR

DESIGNER CONTACT:
K. PETERSON
503-619-4000
K.PETERSON@ALLIANT-SYSTEMS.COM

CAD:
K. PETERSON

PLOT DATE:
05/11/21

MECHANICAL COVER SHEET

PROJECT NUMBER:
C-0444-31270

PERMIT ISSUE
05/11/21

City of Portland
Reviewed for
Code Compliance
Approved: 06/07/2021
Permit #:
21-055455-REV-01-MT

SHEET NUMBER:
M0.00

PROJECT THERMAL DESIGN CONDITIONS

PROJECT LOCATION	PORTLAND, OREGON			
ASHRAE WEATHER STATION REFERENCE	PORTLAND, OREGON (WMO #726980)			
ASHRAE 2017 FUNDAMENTALS WEATHER DATA BASIS	COOLING 0.4%		HEATING 99.6%	
SPACE	SUMMER		WINTER	
	TEMPERATURE	HUMIDITY	TEMPERATURE	HUMIDITY
OUTDOOR	91.7° F. DB / 67.3° F. MCWB	63.2° F. DP / 84.7 HR / 75.1° F. MCWB	21.7° F. DB	9.6° F. DP / 9.0 HR / 29.8° F. MCWB

ROOM INTERNAL LOADS

ROOM NAME	ROOM DESIGN CONDITIONS (DRY BULB TEMP (F)/ RELATIVE HUMIDITY (%))	AREA		LIGHTING		MISC LOAD		PEOPLE		LOAD DESCRIPTION	HEAT GAIN	UNITS	QTY	HEAT GAIN (BTU/H)	NOTES
										LAUNDRY (200 LB @ 140F EVERY 2 HOURS, ALMOST DRY)	4,900	BTU/H	1	4,900	
										LIGHT TABLES X 6 (86W/BULB, 4 BULBS/TABLE)	344	W	3	3,519	50% DIVERSITY, HALF OF TABLES USED ON AVERAGE
										DOOR OPEN/CLOSE (10x PER HOUR)	5,746	BTU/H	1	5,746	
										LIGHTING	1,040	W	-	3,546	
										MISC LOAD	260	W	-	887	
CLEAN ROOM	COOLING: 72F/55% RH, HEATING 70F/35%RH	1,040	SF	1.0	W/SF	0.3	W/SF	4	PPL	PEOPLE	250	BTU/H	4	1,000	
	NOTE: CODE ACCEPTABLE RANGE 68F-73F, 30%-60% RH									HEAT LOAD TO ROOM TOTAL (BTU/H) ->				19,598	

DESIGN PARAMETERS/CONTINGENCIES

- DESIGN IS TO MEET 2016 HLAC STANDARDS FOR "SURGICAL PACK ASSEMBLY ROOM", MINIMUM 10 ACH OF RECIRCULATED AIR.
- ROOM DIMENSIONS ARE 44' x 26' x 9'6"
- ROOF IS ASSUMED TO BE INSULATED.
- MAIN WAREHOUSE AREA IS ASSUMED TO BE 100F ON A DESIGN DAY. WALLS BETWEEN WAREHOUSE AND CLEANROOM ARE UNINSULATED 2X4 STUD WALLS W/ DRYWALL ON BOTH SIDES.
- AIR FROM MAIN WAREHOUSE TO CLEAN ROOM MAY CAUSE HUMIDITY ISSUES. TUNE UP OF DOORS MAY BE REQUIRED.

CLEANROOM AIRFLOW COMPLIANCE SCHEDULE

ROOM NAME	AREA SF	HEIGHT FT.	HLAC REQUIREMENTS: OCCUPANCY TYPE	PRESSURE RELATIONSHIP TO ADJACENT AREAS: ASHRAE 170	ACTUAL	PRESSURIZATION CFM	MIN OUTSIDE AIR AC/HR: CODE MIN OSA AC/HR	ACTUAL OSA AC/HR	MIN TOTAL CIRCULATED AC/HR: CODE MIN AC/HR	ACTUAL AC/HR	RECIRCULATED BY MEANS OF ROOM UNITS: ASHRAE 170	ACTUAL	OUTDOOR AIR TOTALS: REQD OSA CFM	ACTUAL OSA CFM	TOTAL AIRFLOW CALCULATIONS: ACTUAL SUPPLY	ACTUAL RETURN	ACTUAL EXHAUST	ACTUAL RECIRC CFM	REQD TOTAL CFM	ACTUAL TOTAL CFM	OSA %	REMARKS
LAUNDRY CLEAN ROOM	1040	9.50	SURGICAL PACK ASSEMBLY ROOM	POSITIVE	POSITIVE	350	2	2.1	10	16.7	NO	NO	329	338	2750	2400	0	0	1647	2750	12%	

ROOFTOP AIR HANDLING UNIT - DX COOL & GAS HEAT

UNIT TAG	AREA SERVED	CONFIGURATION	MANUFACTURER & MODEL	DX COOLING: NOM TONS	COOLING (MBH) TOTAL	COOLING (MBH) SENS	ENTERING DB/WB (F)	COIL LEAVING DB/WB (F)	UNIT LEAVING DB/DP	EER/IEER (ARI)	HOT GAS REHEAT: HEAT (MBH)	LEAVING DB (F)	NATURAL GAS HEAT: HEAT (MBH) INPUT	HEAT (MBH) OUTPUT	MIN EFFIC (%)	TURN DOWN	ENTERING DB (F)	LEAVING DB (F)
RTU-CR	CLEAN ROOM	SINGLE ZONE CONSTANT VOLUME	AAON RN	10	109	81	75.7/62.6	50/50	52/50	11.7/13.8	65	70	90	73	81%	10:1	62	86

UNIT TAG	SUPPLY FAN: CFM	ESP (IN WC)	BHP	HP	DRIVE	POWER EXHAUST FAN: CFM	ESP (IN WC)	BHP	HP	DRIVE	ECONOMIZER (Y/N)	VENTILATION MIN OA (CFM)	HUMIDIFIER SEE HUMIDIFIER SCHEDULE	PRE-FILTER MERV RATING	DEPTH (IN)	FINAL FILTER MERV RATING	DEPTH (IN)	ELECTRICAL VOLT/PH	MCA	MROPD	DIMENSIONS LxWxH (IN)	WEIGHT (LBS)	NOTES
RTU-CR	2,850	1.6	2.22	3	DIRECT	2,850	0.75	1.90	3	DIRECT	Y	350	HU-CR	8	2"	14	4	460/3	32	45	83X79X43	1,500	1-14, A-I

ACCEPTABLE ALTERNATE MANUFACTURERS: AAON, TRANE

ACCESSORIES/OPTIONS...
1. ELEVATION 0 FT ABOVE SEA LEVEL.
2. DISCONNECTS INTEGRAL TO UNIT FROM FACTORY. (CONFIRM VOLTAGE PRIOR TO ORDERING UNIT).
3. ECONOMIZER UNIT - FURNISH COMPLETE WITH THE FOLLOWING FACTORY INSTALLED OPTIONS
   - NON-FUSED DISCONNECT SWITCH
   - MODULATING 100% OA ECONOMIZER COMPLIANT W/ 2019 OREGON ENERGY CODE (ASHRAE 90.1 2016 / TITLE 24 COMPLIANT: LOW LEAKAGE DAMPERS, FAULT DETECTION DIAGNOSTICS, AND ONBOARD AHU CONTROLLER)
   - COMPARATIVE ENTHALPY BASED ECONOMIZER CONTROL
5. FIELD INSTALLED HUMIDIFIER GENERATOR AND DISPERSION ARRAY HOUSED ABOVE CLEAN ROOM CEILING. SEE HUMIDIFER SCHEDULE.
6. COMPRESSOR OPTIONS: VARIABLE SPEED COMPRESSOR
7. PROVIDE WITH FACTORY INSTALLED, WIRED AND MOUNTED VFDs ON BOTH SUPPLY AND POWER EXHAUST
8. SMOKE DETECTOR W/ CENTRAL FIRE ALARM - UNIT REQUIRES RETURN AIR SMOKE DETECTOR TO BE INTERLOCKED WITH BUILDING FIRE ALARM SYSTEM. UNIT TO BE SHUTDOWN, AND FIRE ALARM SYSTEM TO BE NOTIFIED IN THE EVENT OF SMOKE DETECTOR ALARM. INSTALLATION RESPONSIBILITIES:
   - FIRE ALARM CONTRACTOR TO COORDINATE INSTALL REQUIREMENTS AND PROVIDE SMOKE DETECTOR
   - MECHANICAL CONTRACTOR TO INSTALL SMOKE DETECTOR
   - FIRE ALARM CONTRACTOR TO INTEGRATE WITH FIRE ALARM SYSTEM AND EXTEND WIRES TO UNIT CONTROL PANEL
   - CONTROLS CONTRACTOR TO CONNECT INTERLOCK WIRING FROM FIRE ALARM FOR UNIT SHUTDOWN
   - ELECTRICAL CONTRACTOR TO PROVIDE POWER WIRING FOR SMOKE DETECTOR OPERATION
9. BOTTOM OF OUTDOOR AIR INTAKE TO BE MINIMUM OF 3 FT ABOVE ROOF DECK.
10. FACTORY INSTALLED MAGNAHELIC PRESSURE GAGE ON FILTERS.
11. OUTDOOR AIR INTAKE LOUVERS TO PREVENT ENTRAINMENT OF WIND DRIVEN RAIN AND DRAIN AWAY PRECIPITATION. BIRDSCREEN MESH TO BE NO SMALLER THAN 0.5".
12. SURFACES ON INSIDE OF AIR HANDLER ARE TO BE VAPOR IMPERMEABLE. NO EXPOSED LINER ON INTERIOR OF UNIT. CASING TO BE ASHRAE 62.1 COMPLIANT CONSTRUCTION.
13. PROVIDE WITH MANUFACTURED, SEISMIC CURB OF SUFFICIENT HEIGHT TO MEET REQUIREMENT OF OUTDOOR AIR INTAKE AT MINIMUM 36" HEIGHT ABOVE ADJACENT ROOF SURFACE.
14. PROVIDE WITH MOTORIZED DAMPERS FOR OUTDOOR AND RELIEF AIR. DAMPERS TO MEET LEAKAGE RATES PER ASHRAE 90.1 2016 TABLE 6.4.3.4.3

CONTROL NOTES:
A. MANUFACTURER'S STAND ALONE CONTROLS. CONTROL UNIT TO PRIORIZE HUMIDITY SETPOINT BASED ON THERMOSTAT/HUMIDISTAT IN ROOM.
B. PROVIDE SUPPLY AND POWER EXHAUST FAN WITH VFD
C. PROVIDE WITH OFF HOUR CONTROLS WITH AUTOMATIC SHUTDOWN AND OPTIMUM START PER ASHRAE 90.1 2016 SECTION 6.4.3.3
   PROVIDE OFF HOUR CONTROLS WITH OVERRIDE FOR TEMPORARY OPERATION AS REQUIRED FOR MAINTENANCE.
D. PROVIDE WITH ECONOMIZER WITH FAULT DETECTION DIAGNOSTICS PER ASHRAE 90.1 2016, SECTION 6.4.3.12
E. CONTROL POWER EXHAUST FAN VIA ROOM PRESSURE.
F. OUTDOOR AIR AND RELIEF AIR DAMPERS TO CLOSE WHEN UNIT IS NOT IN USE.
G. ZONE TEMPERATURE CONTROLS TO HAVE SETPOINT OVERLAP RESTRICTIONS.
H. CONTROLS ARRANGED SUCH THAT SIMULTANEOUS DEHUMIDIFICATION AND HUMIDIFICATION TO NOT OCCUR.
I. CONTROLS TO BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION.

ELECTRIC STEAM HUMIDIFIER SCHEDULE

UNIT TAG	UNIT SERVED	MANUFACTURER & MODEL	DISPERSION – AIR HUMIDIFICATION: HUMIDIFICATION (LB/H)	ENTERING DB(F)/RH(%)	LEAVING DB(F)/RH(%)	DUCT SIZE W X H (IN)	DISPERSION: RTU AIRFLOW (CFM)	ABSORPTION DIST (FT)	GENERATOR: HEAT INPUT (KW)	WATER PRESSURE MIN PSI	MAX PSI	ELECTRICAL VOLT/PH	FLA	DIMENSIONS (IN)	WEIGHT (LBS)	NOTES
HU-CR	RTU-CR	PURE HUMIDIFIER EC-15	45.0	50F/28%	50F/72%	20X20	2,850	2'	15.0	35.0	60.0	460/3	18.1	30"X17"X24"	225	1-10

ACCEPTABLE ALTERNATE MANUFACTURERS:

ACCESSORIES/OPTIONS NOTES:
1. ELEVATION: 0 FT
2. GENERATOR INSTALLED IN CEILING SPACE AND DISPERSION HOUSED IN SUPPLY AIR DUCT.
3. ROOM CONDITION 70F DB & 35% RH
4. PROVIDE MODULATING SCR HEATER CONTROL FOR 0-100% STEAM OUTPUT MODULATION.
5. PROVIDE WITH MANUFACTURER'S STAND ALONE CONTROLLER FOR DUAL HUMIDITY SENSOR CONTROL. HUMIDITY SENSOR IN SPACE FOR SPACE HUMIDITY CONTROL. HIGH LIMIT HUMIDITY SENSOR IN DUCT DOWNSTREAM OF HUMIDIFIER. MAXIMUM DUCT RELATIVE HUMIDITY TO BE 90%.
6. HUMIDIFICATION DISPERSION TUBE HOT SURFACES IN AIRSTREAM TO BE INSULATED WITH MINIMUM R-5 INSULATION. INSULATION AND JACKETING TO BE RATED FOR PLENUM INSTALLATION.
7. PREHEATING JACKETS MOUNTED IN AIRSTREAM TO BE PROVIDED WITH AN AUTOMATIC VALVE TO SHUTOFF PREHEAT WHEN HUMIDIFICATION IS NOT REQUIRED.
8. PROVIDE WITH DRAIN TEMPERING KIT. INSTALL COPPER OR STAINLESS DRAIN PIPE UPSTREAM OF TEMPERING KIT.
9. INSTALL IN STRICT ACCORDANCE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
10. DISCONNECTS INTEGRAL TO UNIT FROM FACTORY. (CONFIRM VOLTAGE PRIOR TO ORDERING UNIT).

GRILLE REGISTER & DIFFUSER SCHEDULE

SYMBOL	DEVICE TYPE AND SERVICE	MANUFACTURER & MODEL NUMBER	BORDER TYPE	FACE SIZE	FINISH	NOTES
S1 SIZE CFM	SUPPLY - LOUVERED FACE LAY-IN CEILING DIFFUSER	TITUS TMS	TYPE-3 (LAY-IN)	24 x 24	WHITE POWDER COAT UNLESS OTHERWISE NOTED	SEE FLOOR PLANS FOR NECK SIZE.
R1 SIZE CFM	RETURN - PERF FACE LAY-IN CEILING GRILLE	TITUS PAR	TYPE-3 (LAY-IN)	24 x 24	WHITE POWDER COAT UNLESS OTHERWISE NOTED	SEE FLOOR PLANS FOR NECK SIZE.

ACCEPTABLE ALTERNATE MANUFACTURERS (SUBJECT TO ENGINEERING APPROVAL) - PRICE, KREUGER

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REGISTERED PROFESSIONAL ENGINEER
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09/25/2008
SEAN C. MURRAY
EXPIRES 12-31-22

REVISIONS: DATE

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CAD:
K. PETERSON

PLOT DATE:
05/11/21

MECHANICAL
SCHEDULES

PROJECT NUMBER:
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DUCTWORK SCHEDULE

NOTE: ALL SYSTEMS AND PIPING MATERIALS MAY NOT BE USED ON EVERY PROJECT

SERVICE / USAGE	LOCATION	MATERIAL	WORKING PRESURE (IN. WC)	SMACNA PRESSURE CLASS (IN. WC)	SMACNA SEAL CLASS	NOTES
LOW PRESSURE SUPPLY AIR	FROM RTU TO GRD'S	GALV. STEEL UNLESS NOTED OTHERWISE	LOW PRESSURE	1	A	1,2,3
FLEXIBLE DUCT	CONN TO GRD'S	PREINSUL. FLEX	LOW PRESSURE	RATED +6", -1"	NA	4
RETURN AIR	FROM GRD'S TO AHU	GALV. STEEL	LOW PRESSURE	1	A	1,2,3

NOTES:
1. SHEET METAL GAGES AND FITTINGS PER SMACNA AND ALLIANT DUCT CONSTRUCTION STANDARDS
2. SEAL ALL LONGITUDINAL AND TRANSVERSE DUCT JOINTS WITH WELDS, GASKETS, MASTICS, TAPES, OR OTHER APPROVED SYSTEMS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS
3. INSTALL PER MANUFACTURER'S GUIDELINES AND INSTRUCTIONS
4. PROVIDE FLEX DUCT WITH R-6 MIN INSUL AND MAX INSTALL LENGTH 7 FT. PRODUCT: ATCO UPC, THERMAFLEX "GKM", OR EQUIVALENT.

DUCTWORK INSULATION SCHEDULE

NOTE: ALL SYSTEMS AND INSULATION TYPES MAY NOT BE USED ON EACH PROJECT

SERVICE:	DUCT LOCATION/TYPE:	FIBERGLASS INSULATION TYPE:	NOTES:
INSIDE BUILDING ENVELOPE			
INSULATED FLEXIBLE SUPPLY DUCT	CONCEALED LOW PRESSURE DUCT	MANUF ASSEMBLY W/ REINFORCED VAPOR BARRIER, MINIMUM R-6 FIBERGLASS INSULATION, NON-PERFORATED INTERIOR LINER W/ STRUCTURAL WIRE HELIX	FLEXIBLE DUCT SHALL BE CERTIFIED AS A UL 181 LISTED, CLASS-1 AIR DUCT.
LOW PRESSURE SUPPLY AIR	CONCEALED LOW PRESSURE DUCT	INSULATION WRAP (MIN R-6)	
RETURN AIR	CONCEALED FROM GRD TO AHU	INSULATION WRAP (MIN R-6)	

INSULATION SPECIFICATION: KNAUF, CERTAINTEED, OWENS CORNING, OR APPROVED EQUAL.

1. SUPPLY AIR FIBERGLASS DUCT WRAP INSULATION: 1.5 PCF - MINIMUM R-6, EXTERIOR FOIL SCRIM REINFORCED VAPOR BARRIER COVERING
2. DUCTWORK INSULATION SHALL BE INSTALLED AS INDICATED ON DRAWINGS, AND AS REQUIRED PER CODE.

MECHANICAL PIPING SCHEDULE

NOTE: ALL SYSTEMS AND PIPING MATERIALS MAY NOT BE USED ON EVERY PROJECT

SERVICE	LOCATION	SIZE	PIPE	PIPE MATL STANDARD	FITTINGS	JOINTS	WORKING PRESSURE	TEST PRESSURE	NOTES
NATURAL GAS	INTERIOR ABOVE GRADE (EXPOSED, NON-PLENUM)	1/2" - 2"	BLACK STEEL SCH 40	ASTM A53-B	BLACK STEEL SCH 40	THREADED	≤ 2 PSI	60 PSI	
		1/2" - 2"	BLACK STEEL SCH 40	ASTM A53-B	PRESS-CONNECT	MECHANICAL PRESS-CONNECT	≤ 2 PSI	60 PSI	8
	INTERIOR ABOVE GRADE (IN-PLENUM OR CONCEALED)	1/2" - 2"	BLACK STEEL SCH 40	ASTM A53-B	BLACK STEEL SCH 40	WELDED	≤ 5 PSI	60 PSI	
	EXTERIOR ABOVE GRADE	1/2" - 2"	BLACK STEEL SCH 40	ASTM A53-B	BLACK STEEL SCH 40	WELDED	≤ 2 PSI	60 PSI	1
		1/2" - 2"	BLACK STEEL SCH 40	ASTM A53-B	BLACK STEEL SCH 40	THREADED	≤ 2 PSI	60 PSI	4

NOTES:
1. EXPOSED, EXTERIOR, ABOVE-GRADE NATURAL GAS PIPING SHALL BE PAINTED WITH CORRISION RESISTANT PAINT, OR APPROVED PIPING WRAP

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09/25/2000
SEAN C. MURRAY

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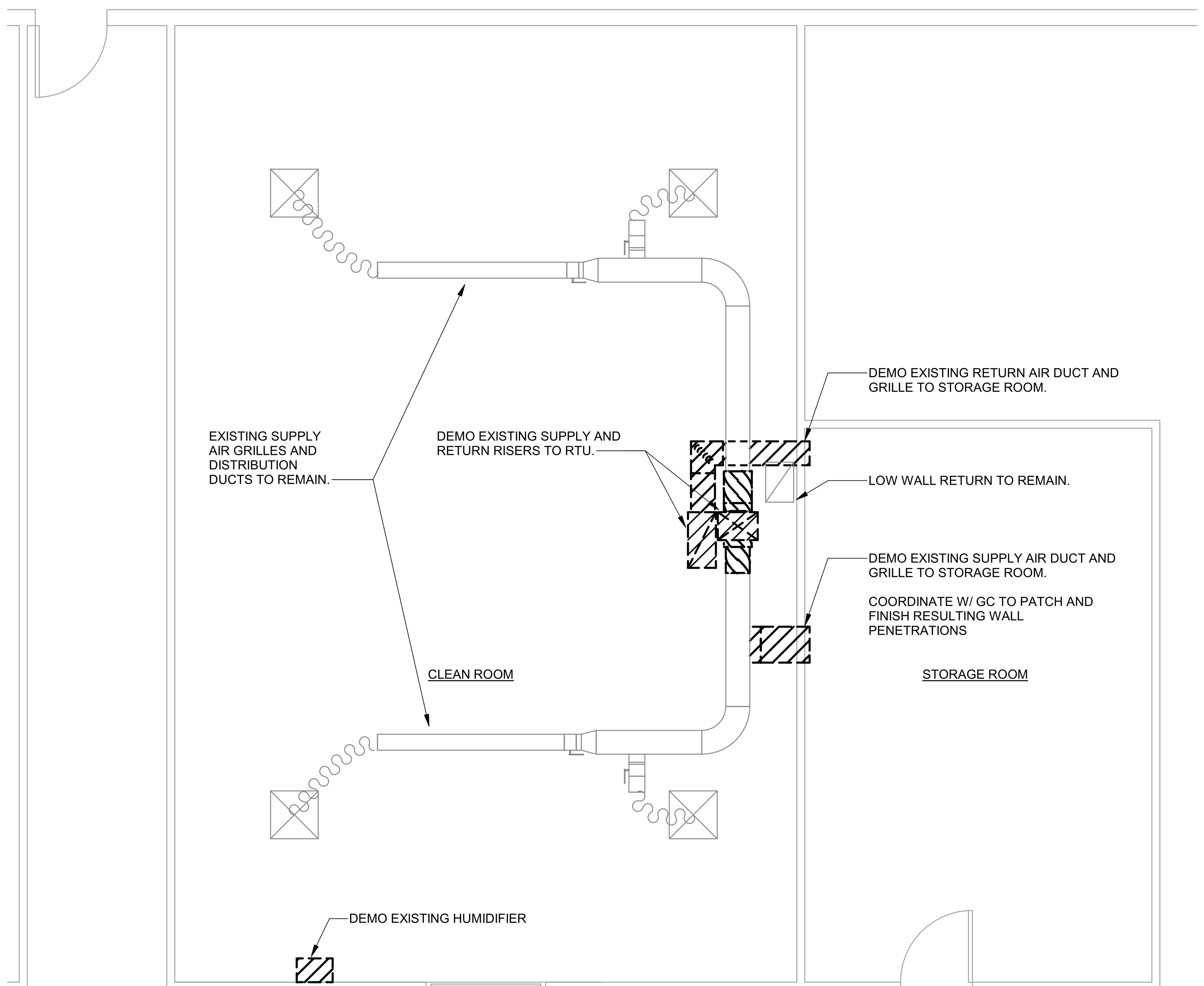
HVAC GENERAL NOTES

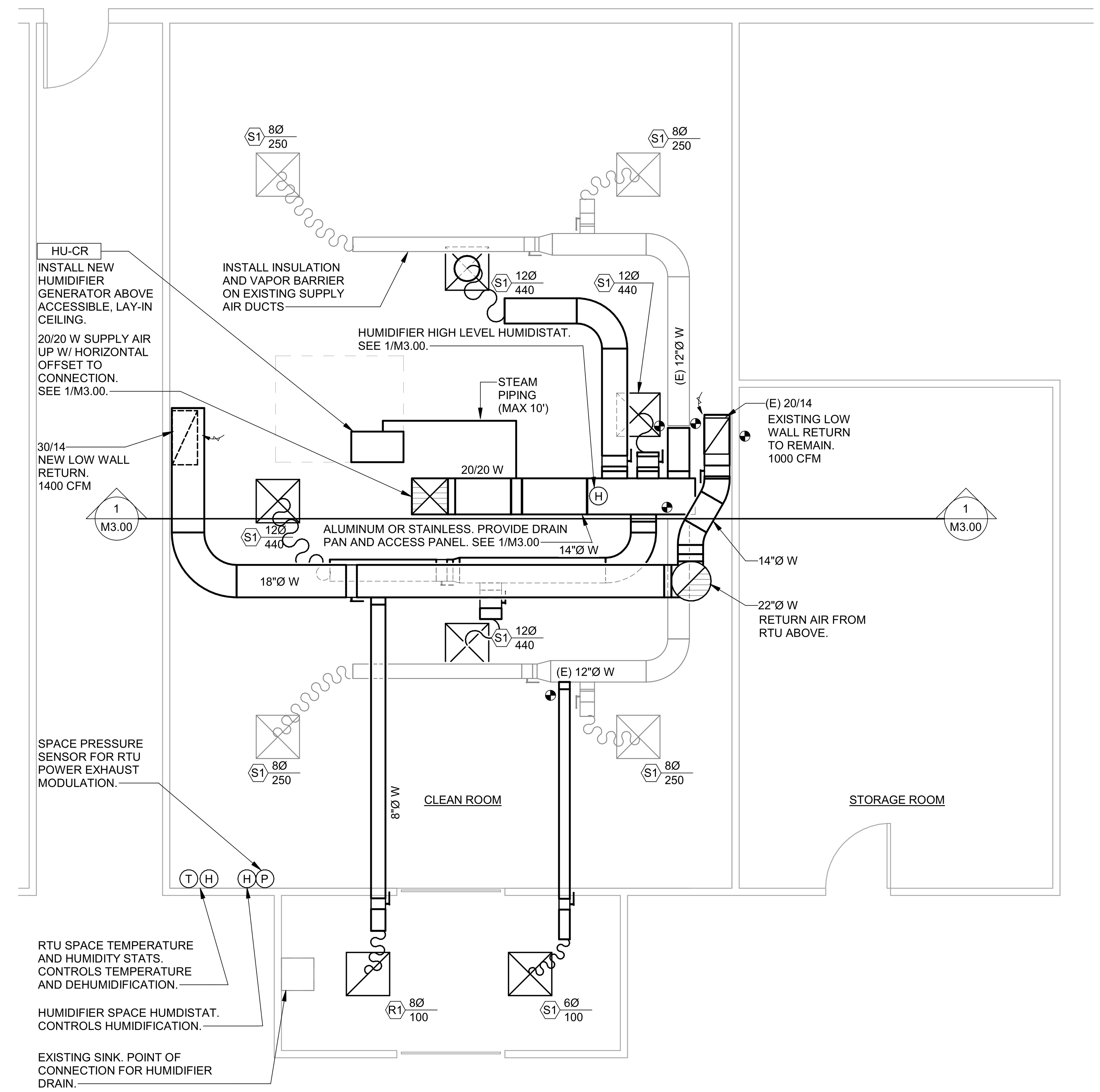
A. UNLESS OTHERWISE NOTED, BRANCH DUCT TO DIFFUSER TO MATCH DIFFUSER NECK SIZE.

B. NO SOUND LINED SHEET METAL OR OTHER VAPOR PERMIABLE MATERIAL ON INTERIOR OF DUCTS.



1 M2.01 MECHANICAL FIRST FLOOR HVAC DEMO PLAN

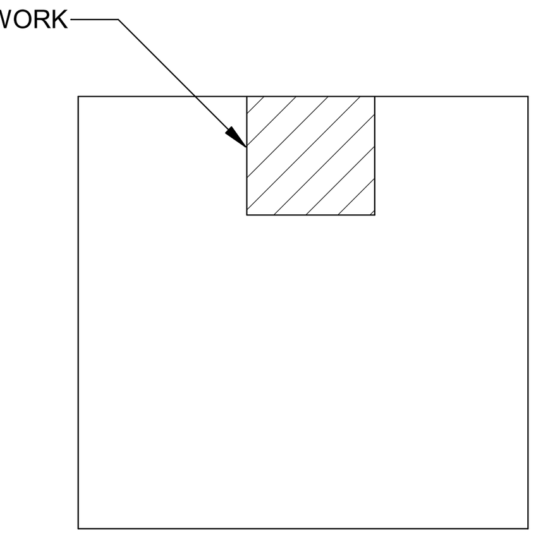
1/4" = 1'-0" 0 4' 8' 16'



2 M2.01 MECHANICAL FIRST FLOOR HVAC PLAN

1/4" = 1'-0" 0 4' 8' 16'

AREA OF WORK



KEY PLAN

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MECHANICAL FIRST FLOOR HVAC PLANS

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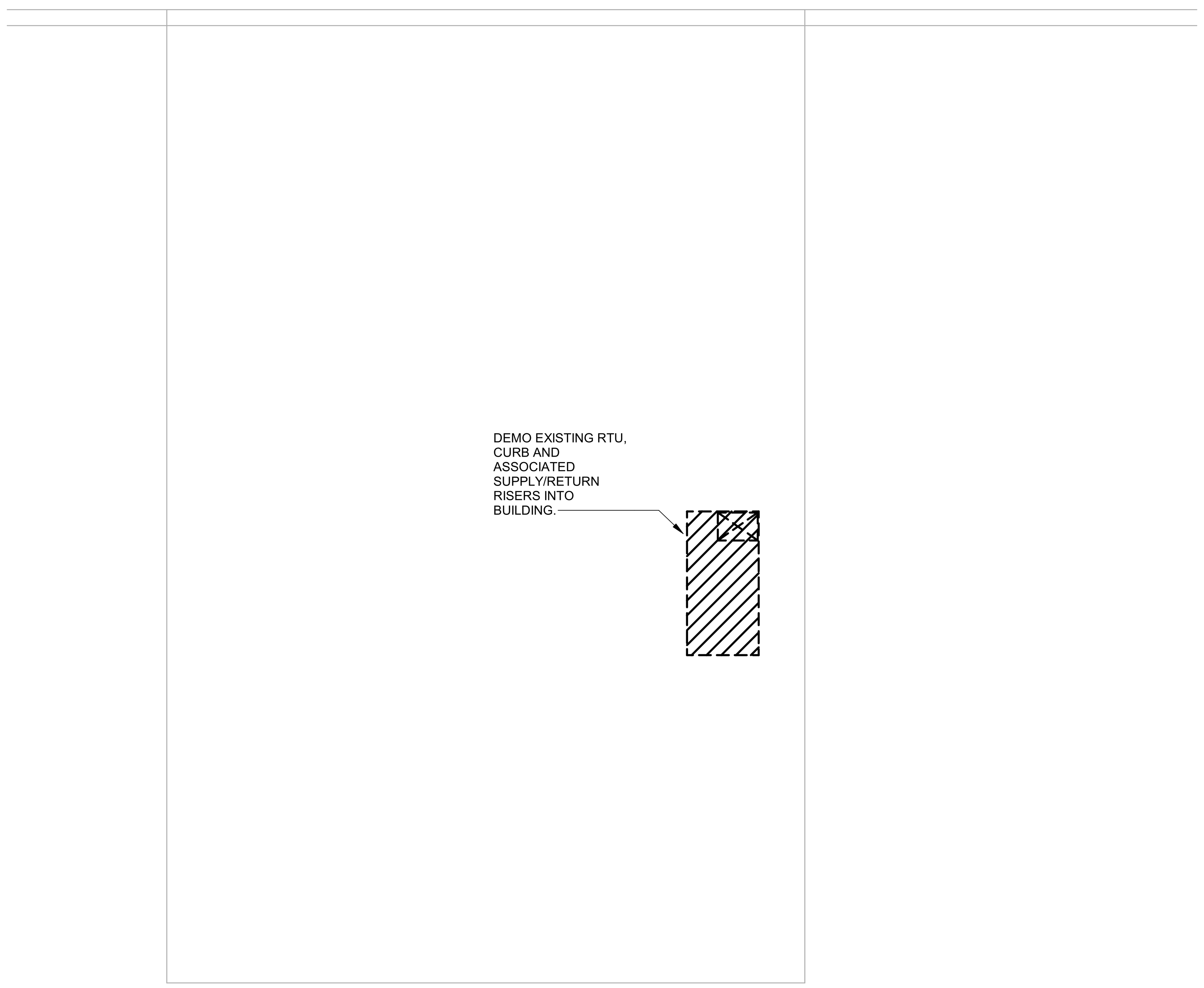
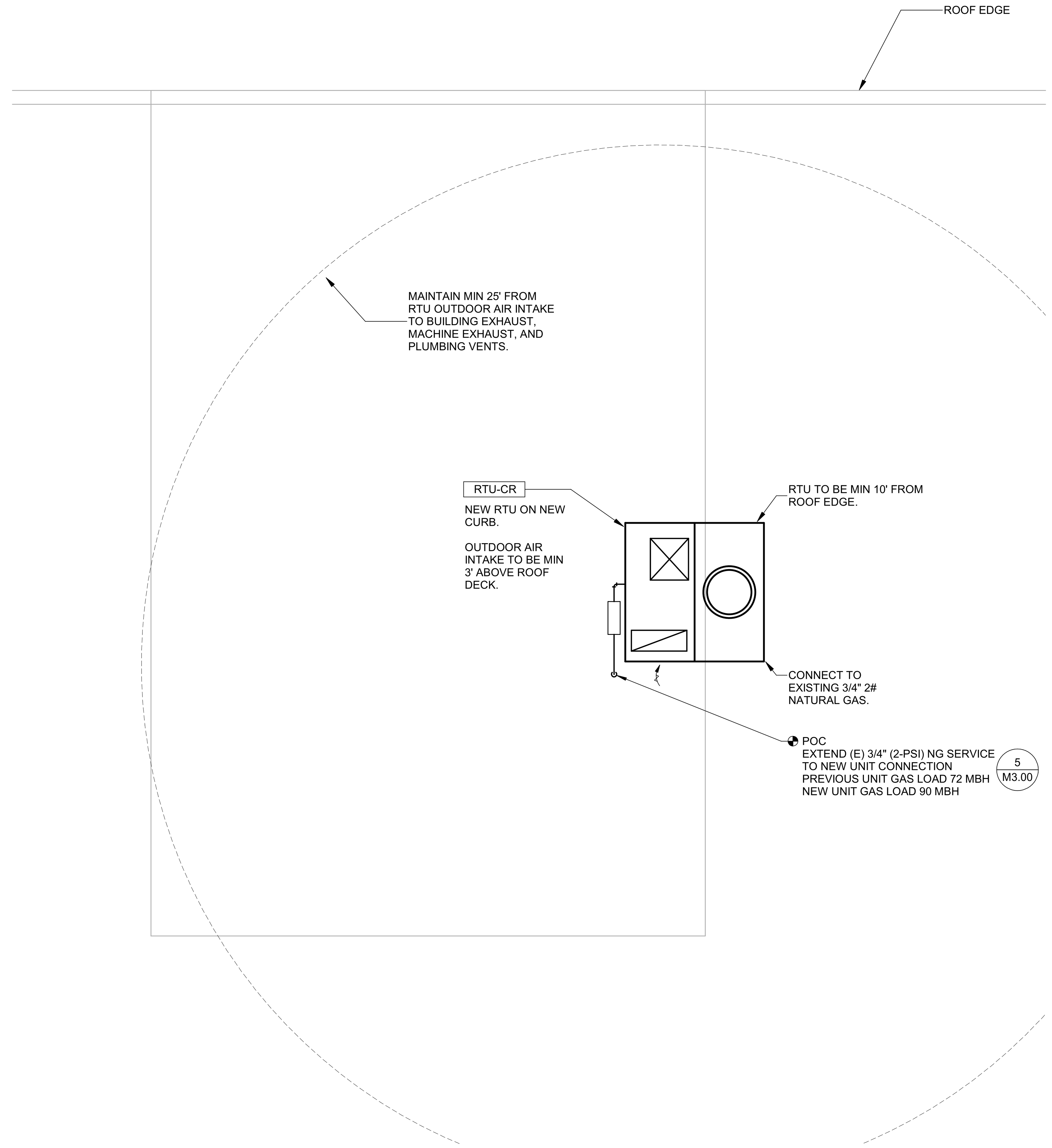
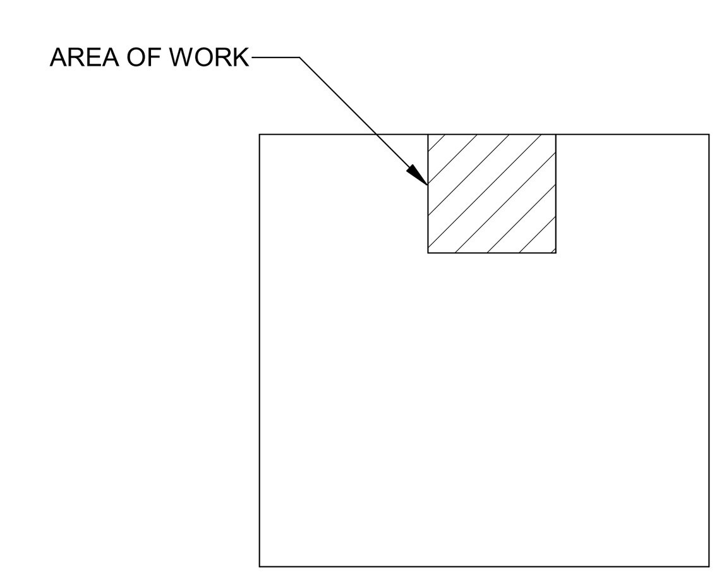


1 M2.02 MECHANICAL ROOF HVAC DEMO PLAN
1/4" = 1'-0"
0 4' 8' 16'



2 M2.02 MECHANICAL ROOF HVAC PLAN
1/4" = 1'-0"
0 4' 8' 16'



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MECHANICAL ROOF
HVAC PLANS

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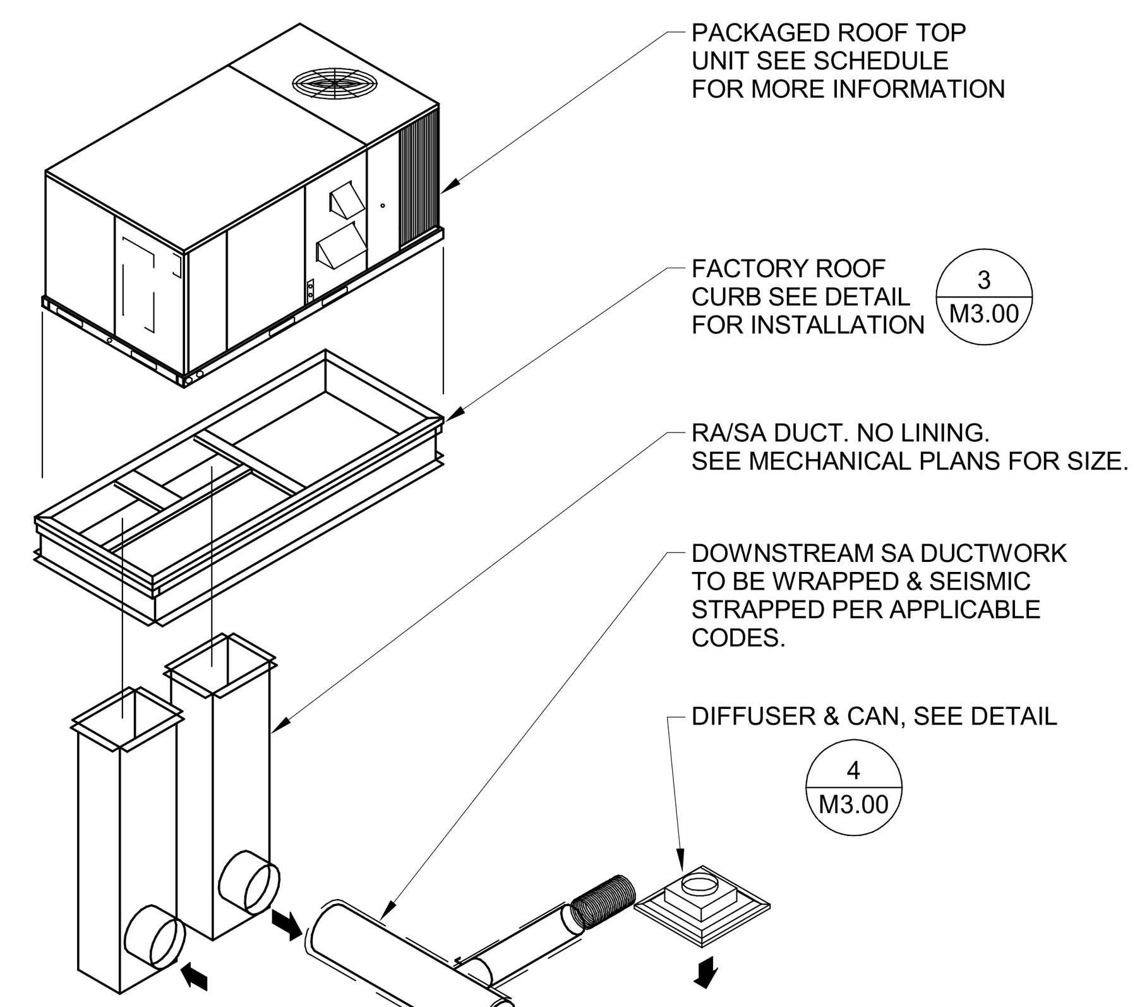
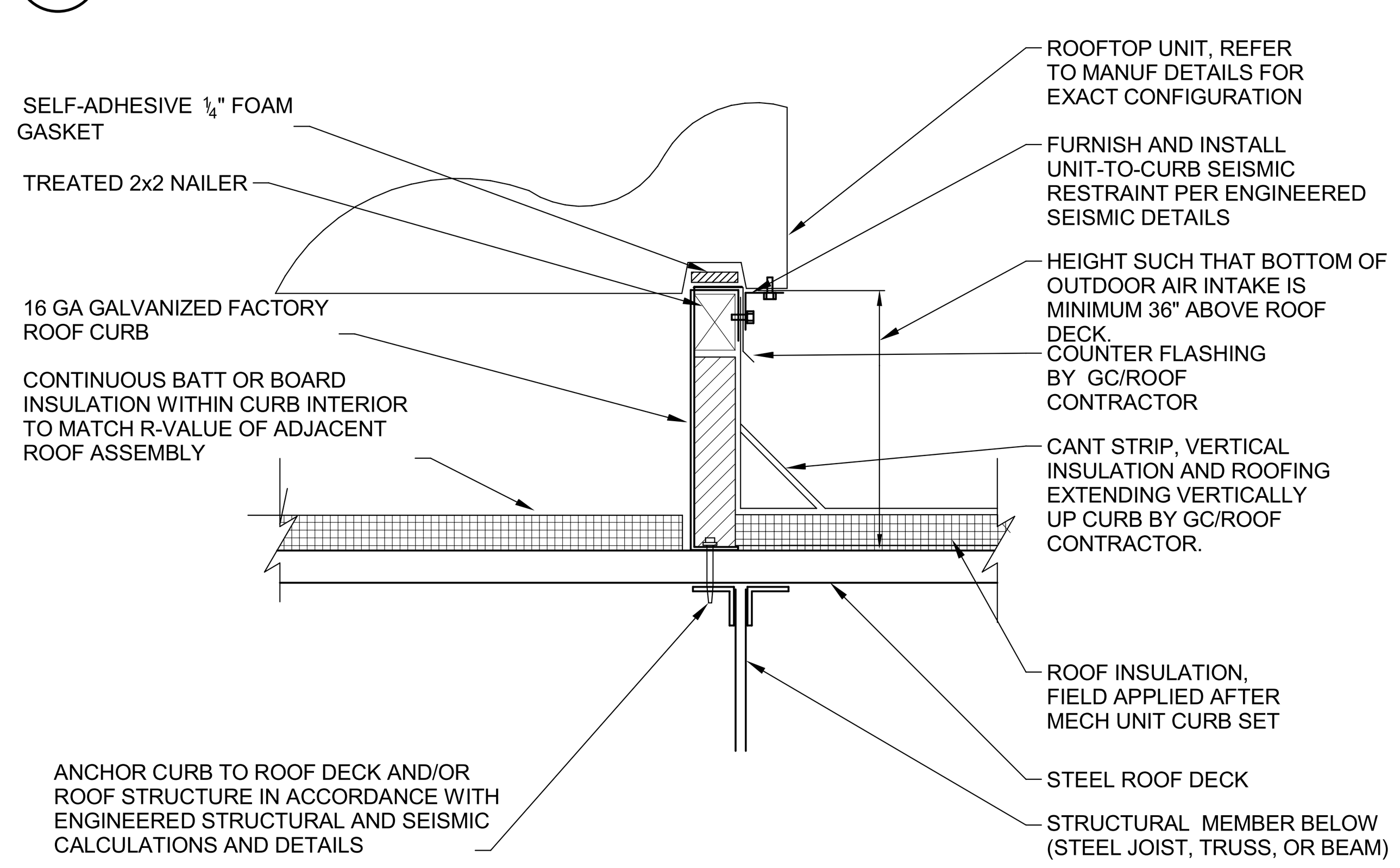
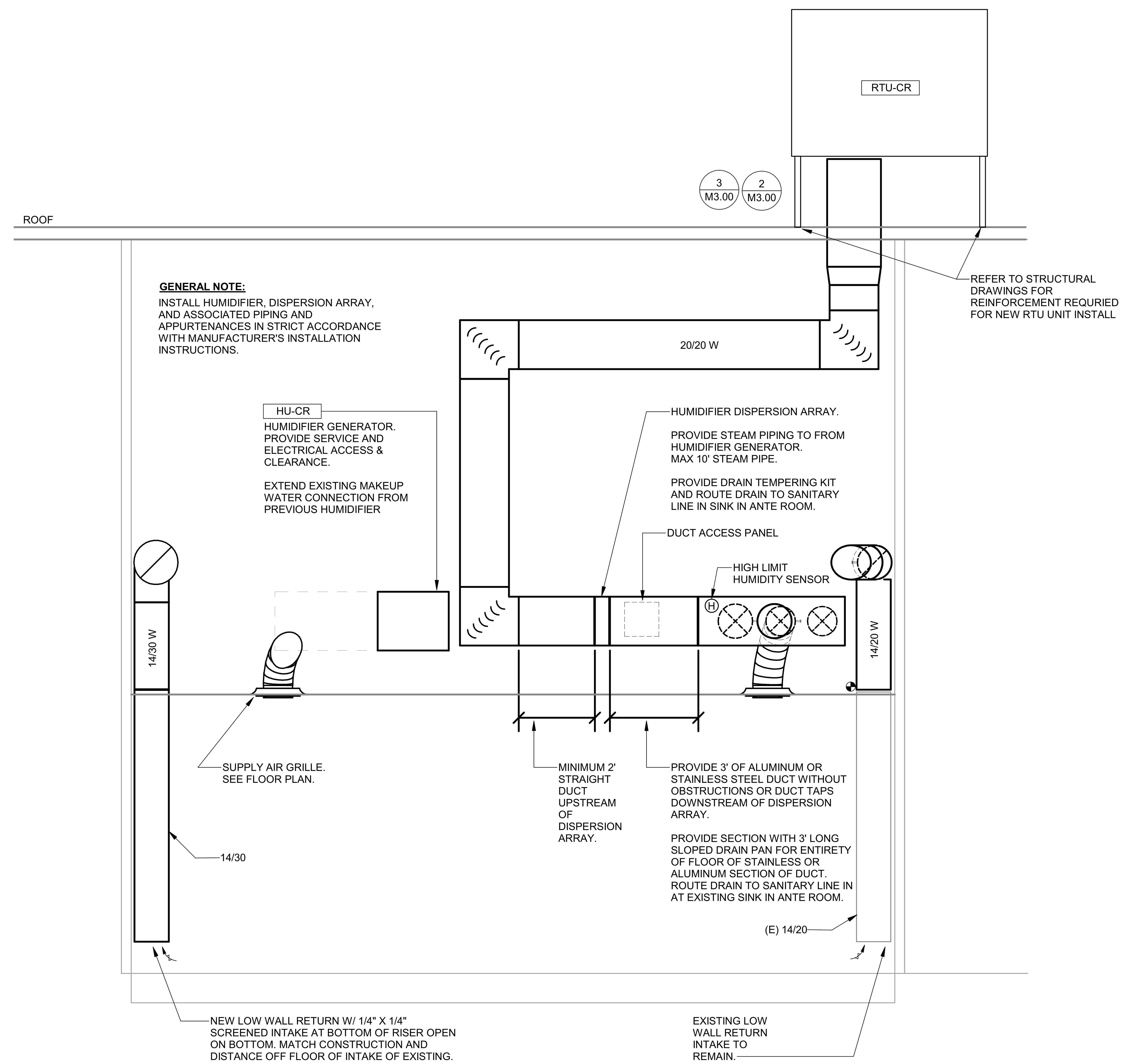


2 M3.00 1-15 TON GAS-ELECTRIC RTU SYSTEM - DUCTED
NO SCALE

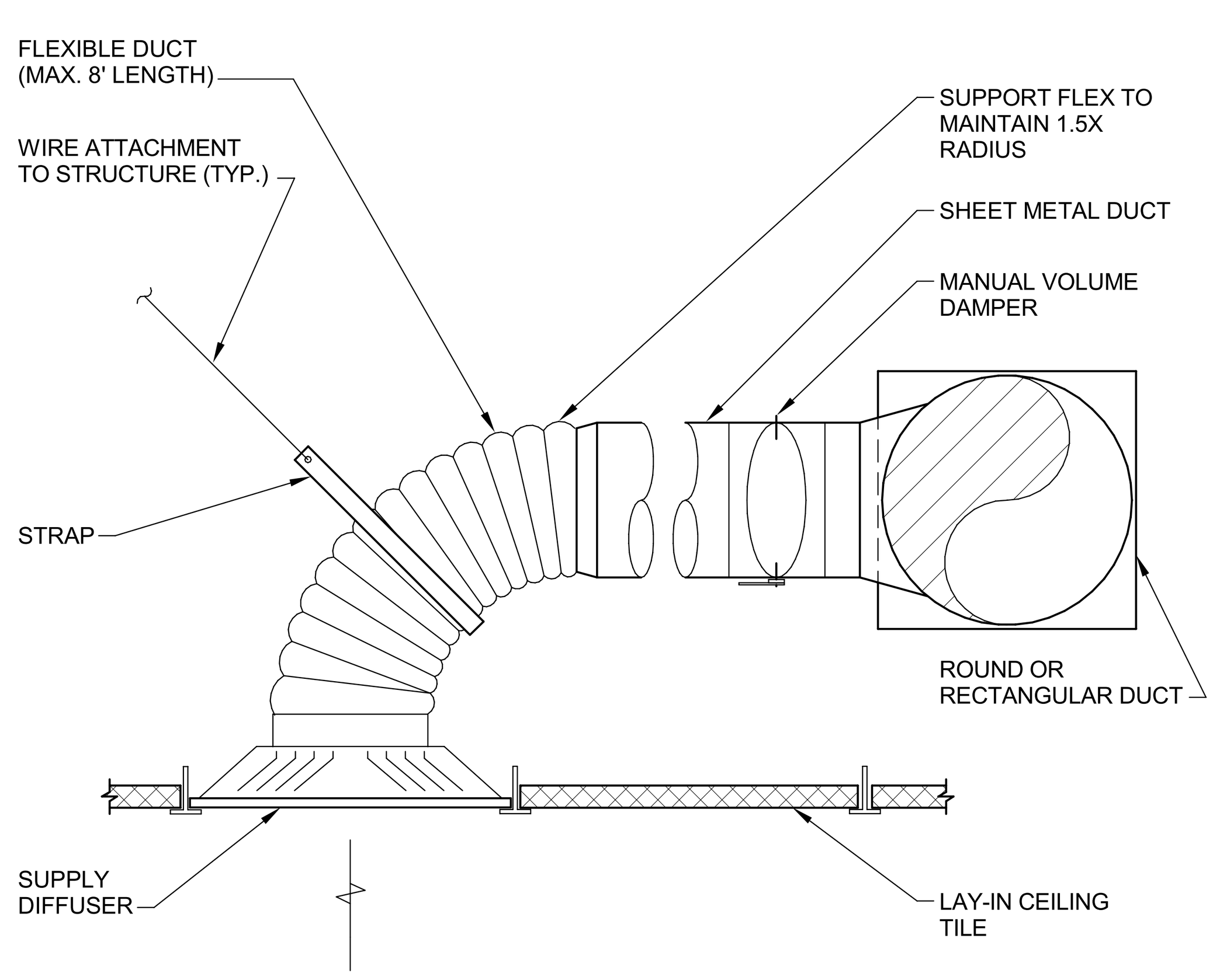


NOTES:
1.ALL ANCHORING AND SEISMIC RESTRAINTS SHALL BE REVIEWED BY STRUCTURAL ENGINEER.
2.ROOF TOP EQUIPMENT SHALL BE INSTALLED ON ROOF IN THE LOCATION WITH ADEQUATE STRENGTH TO SAFELY SUPPORT THE ENTIRE WEIGHT OF THE UNIT AND SERVICE PERSONNEL. CARE SHALL BE TAKEN NOT TO DAMAGE THE ROOF, COORDINATE WITH STRUCTURAL ENGINEER.

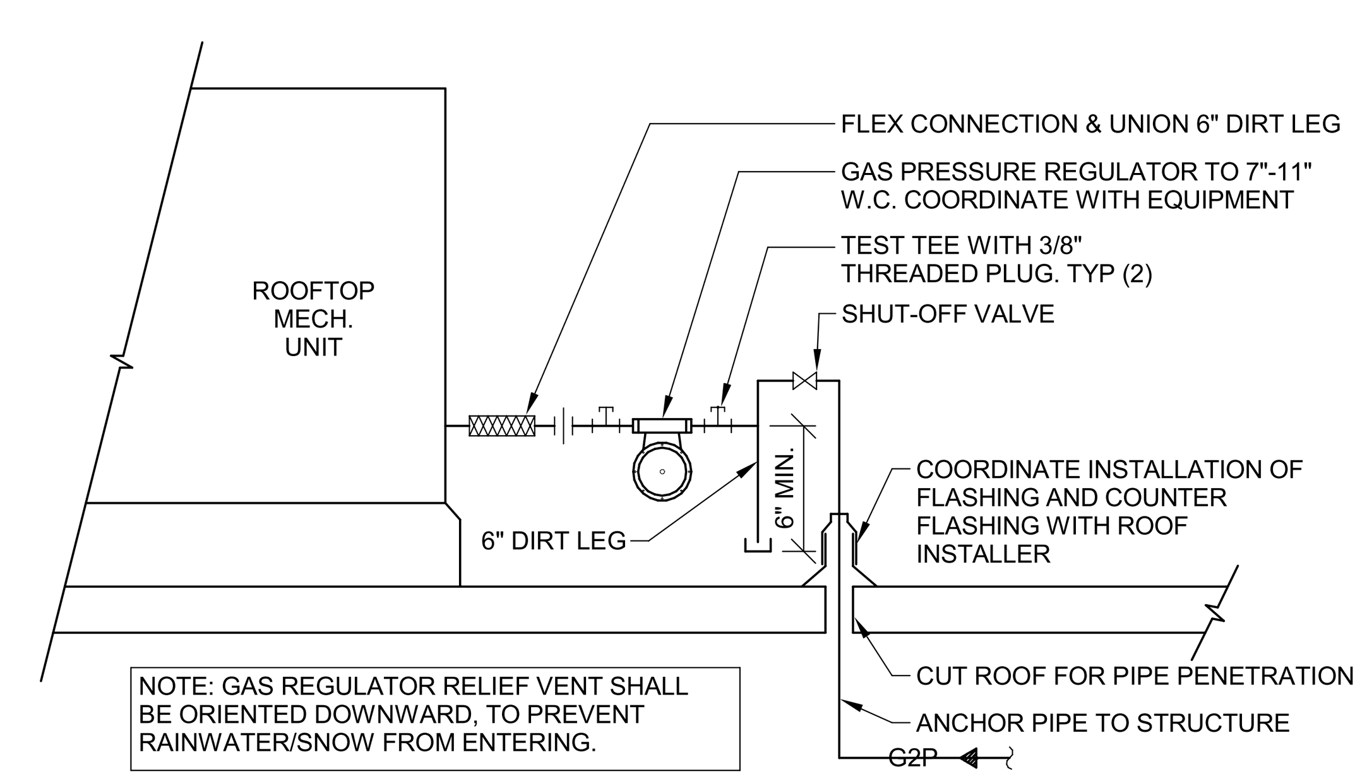
3 M3.00 1-15 TON RTU CURB DETAIL W SEISMIC RESTRAINT (STEEL DECK)
NO SCALE



1 M3.00 SECTION
3/8" = 1'-0"
0 4' 8' 16'



4 M3.00 LAY-IN SUPPLY DIFFUSER INSTALL
NO SCALE



5 M3.00 ROOFTOP NATURAL GAS EQUIPMENT CONNECTION
NO SCALE

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STRUCTURAL NOTES

GENERAL

THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE PLANS PRIOR TO THE START OF CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY ERRORS OR INCONSISTANCY WITH THE ARCHITECTURAL OR SUPPLIER DRAWINGS. SHOULD QUESTIONS ARISE REGARDING THE INFORMATION SHOWN ON THESE DRAWINGS THE CONTRACTOR SHALL CONTACT THE ENGINEER BEFORE PROCEEDING. THE ENGINEER IS NOT RESPONSIBLE FOR IMPROPER CONSTRUCTION PRACTICES DUE TO MISUNDERSTANDING OR MISUSE OF THE INFORMATION ON THESE DRAWINGS.

THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE DURING THE CONSTRUCTION PERIOD FOR ALL CONDITIONS AT THE CONSTRUCTION SITE, INCLUDING SAFETY OF PROPERTY AND PERSONS. THE ENGINEER'S VISITS TO THE SITE AREA ARE NOT INTENDED, NOR SHALL THEY BE CONSTRUED TO INCLUDE A REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STRENGTH AND STABILITY OF ALL LIFTING EQUIPMENT, SHORING, BRACING, SCAFFOLDING AND TEMPORARY SUPPORTS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE WATERPROOFING AND FLASHING DETAILS OF ALL STRUCTURAL & MECHANICAL ELEMENTS INDICATED ON THESE DRAWINGS.

WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE DIMENSIONS. DO NOT SCALE DRAWINGS. ALL STRUCTURAL DIMENSIONS ARE TO FACE OF FRAMING, UNLESS NOTED OTHERWISE.

CONTRACTOR SHALL REVIEW DRAWINGS WITH RESPECT TO MATERIALS, LAYOUT, ELEVATIONS, AND DIMENSIONS BEFORE STARTING WORK. ANY APPARENT DISCREPANCY, AMBIGUITY, OR CONFLICT IN THESE DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. ANY REVISION TO THESE DRAWINGS SHALL BE COMPLETED BEFORE PROCEEDING WITH THE WORK AFFECTED.

CODES AND STANDARDS

2019 OREGON STRUCTURAL SPECIALTY CODE

DESIGN LOADS

SEISMIC LOADING: Ss= 0.880 S1= .371g (SITE SPECIFIC)

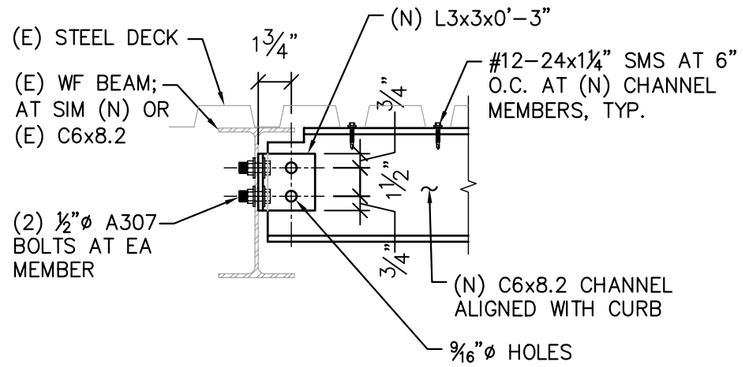
RTU-CR REPLACEMENT ROOF TOP HVAC UNIT. MAX OPERATING WEIGHT = 1500 LBS. (W/ CURB)

EF-7 REPALCEMENT EXHAUST FAN. MAX OPERATING WEIGHT = 500 LBS (W/ CURB)

ORIGINAL ROOF PLAN SPECIFIES THE MECHANICAL UNIT WEIGHT ALLOWANCE OF 2000 LBS

STRUCTURAL ABBREVIATIONS

BOT	BOTTOM	LG	LIGHT GAGE
BTWN	BETWEEN	MAX	MAXIMUM
CL	CENTER LINE	MIN	MINIMUM
COL	COLUMN	(N)	NEW
CTR	CENTER	NTS	NOT TO SCALE
DBL	DOUBLE	OC	ON CENTER
DIA	DIAMETER	REQ	REQUIRED
DWG	DRAWING	SCH	SCHEDULE
DTL	DETAIL	SHT	SHEET
(E)	EXISTING	SIM	SIMILAR
EA	EACH	SMS	SHEET METAL SCREW
EQ	EQUAL	TYP	TYPICAL
EXT	EXTERIOR	UNO	UNLESS NOTED OTHERWISE
INT	INTERIOR	VERT	VERTICAL
		W/	WITH



1/S1 CONNECTION DETAIL

C TO WF

REGISTERED PROFESSIONAL ENGINEER
OREGON
MAR. 14, 2006
MICHAEL D. ARCHER
EXP: 12/31/21

ROOF-TOP HVAC UNIT INSTALL
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ARCHER ENGINEERING L.L.C.
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CLIENT
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SHEET CONTENTS
STRUCTURAL NOTES

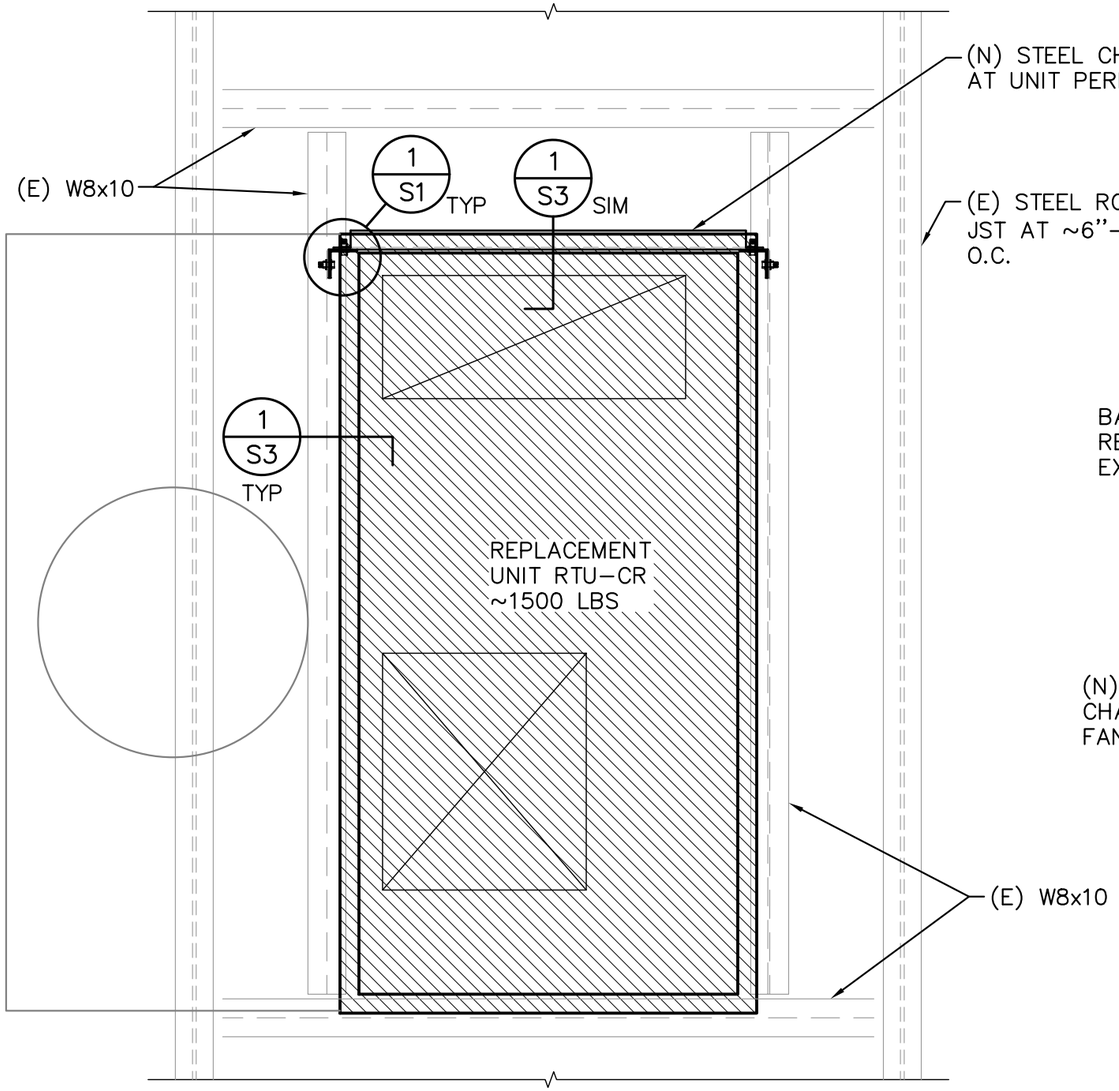
DESIGNED BY
MDA

SCALE
AS NOTED

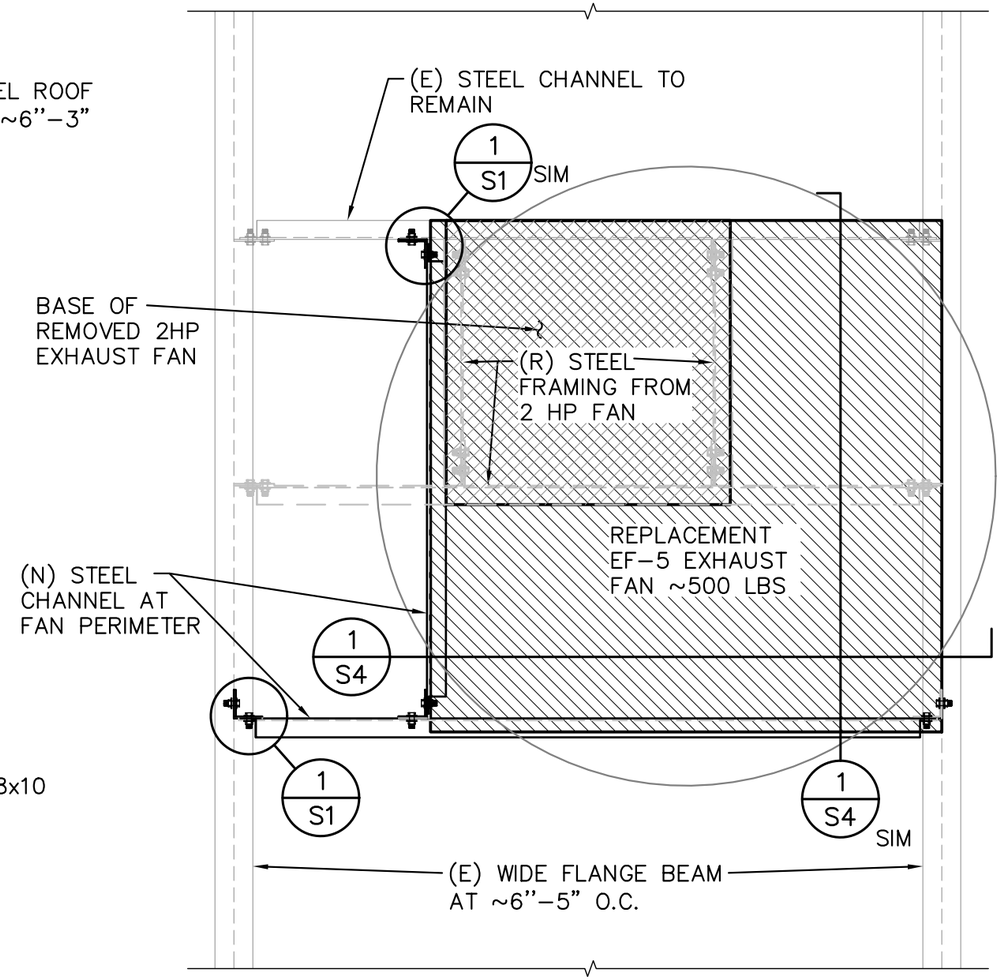
DATE
5/18/2021

JOB NUMBER
AE2132

SHEET NUMBER
S1



1/S2 STEEL FRAMING AT HVAC UNIT
3/4" = 1'–0"
RTU–CR



2/S2 STEEL FRAMING AT FAN
3/4" = 1'–0"
EF–7

REGISTERED PROFESSIONAL ENGINEER
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MAR. 14, 2007
MICHAEL D. ARCHER
EXP: 12/31/21

ROOF–TOP HVAC UNIT INSTALL

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SHEET CONTENTS
PARTIAL PLANS

DESIGNED BY
MDA

SCALE
AS NOTED

DATE
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JOB NUMBER
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SHEET NUMBER
S2

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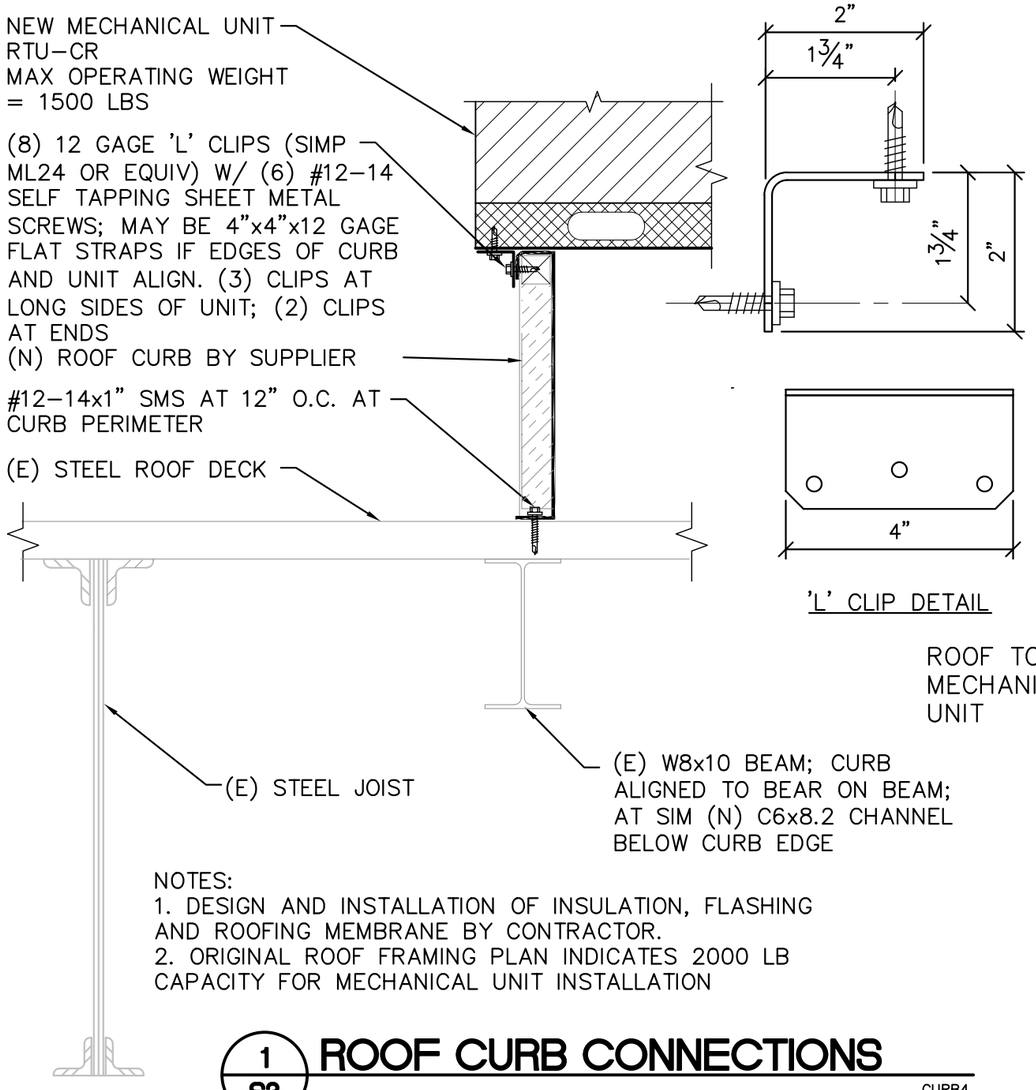
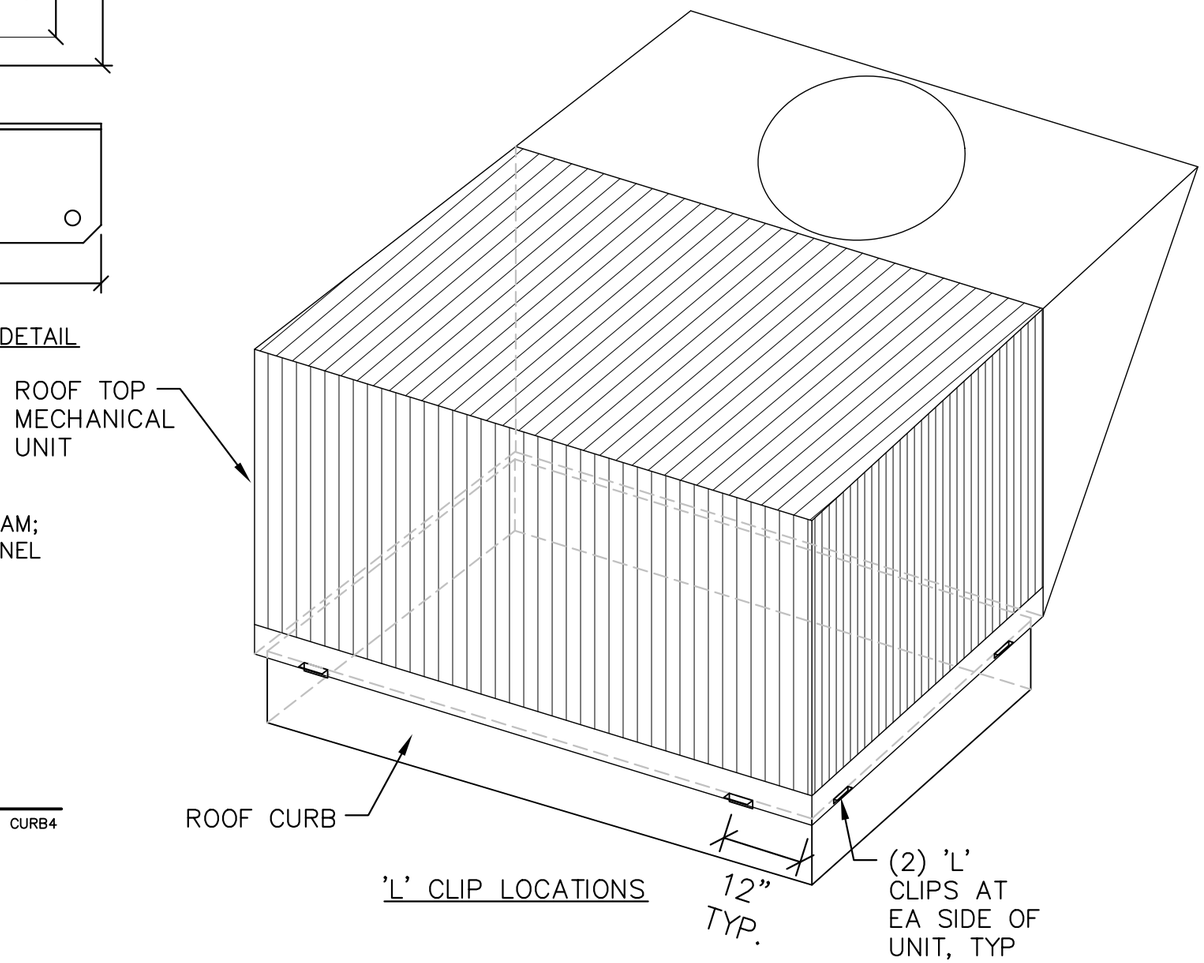


'L' CLIP DETAIL

NOTES:
1. DESIGN AND INSTALLATION OF INSULATION, FLASHING AND ROOFING MEMBRANE BY CONTRACTOR.
2. ORIGINAL ROOF FRAMING PLAN INDICATES 2000 LB CAPACITY FOR MECHANICAL UNIT INSTALLATION

1/S3 ROOF CURB CONNECTIONS

CURB4



REGISTERED PROFESSIONAL ENGINEER
OREGON
MAR. 14, 2000
MICHAEL D. ARCHER
EXP: 12/31/21

ROOF-TOP HVAC UNIT INSTALL

PORTLAND HOSPITAL SERVICES
18440 NE PORTAL WAY, PORTLAND, OR

ARCHER ENGINEERING L.L.C.
2345 NE 37th Ave., Portland, OR 97212 P 503.281.6441 F 503.281.6441 C 503.730.3357 E archereng@comcast.net

CLIENT
ALLIANT SYSTEMS
351 SW 12TH AVE.
PORTLAND, OR 97209

SHEET CONTENTS
DETAILS

DESIGNED BY
MDA

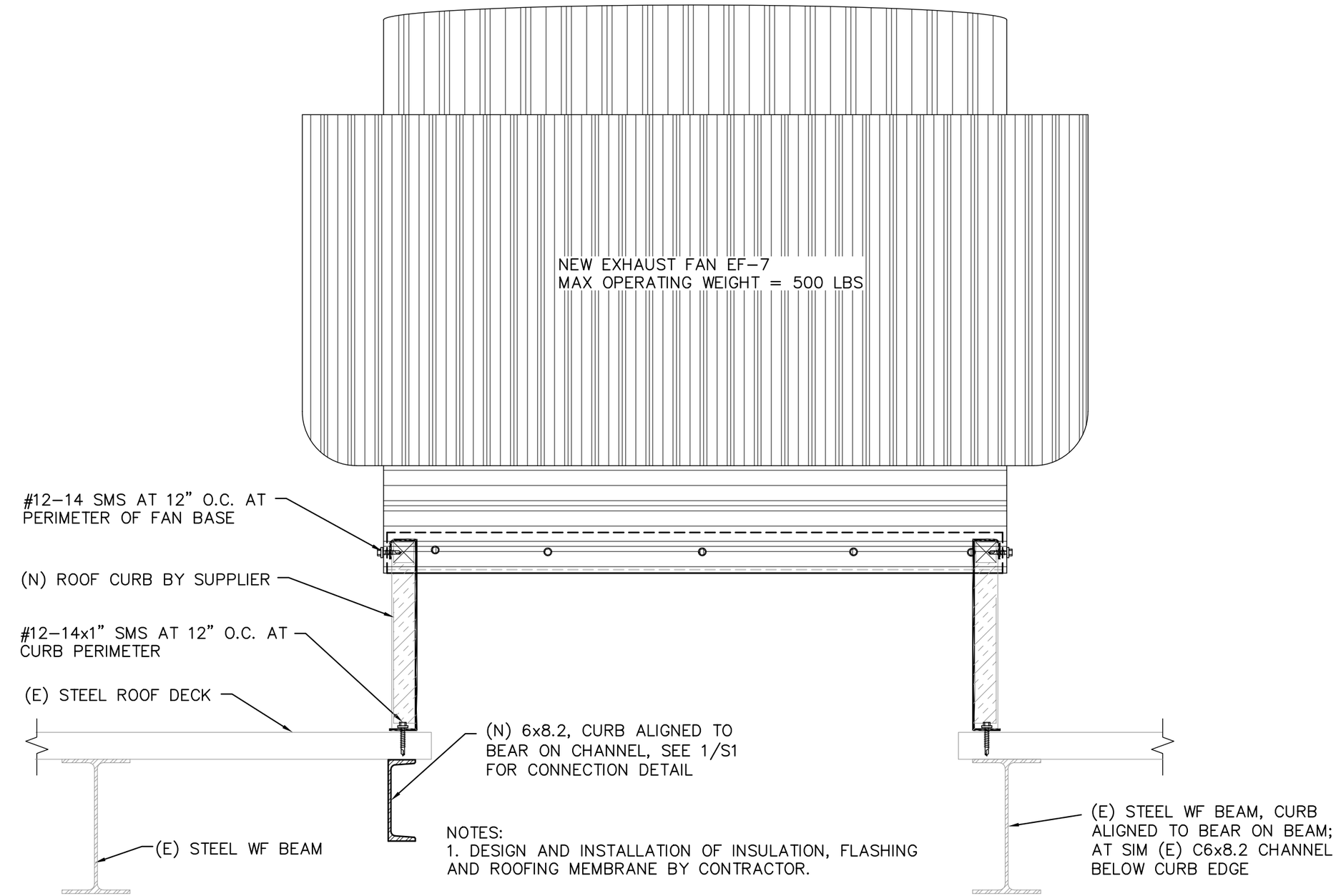
SCALE
AS NOTED

DATE
5/18/2021

JOB NUMBER
AE2132

SHEET NUMBER
S3

City of Portland
Reviewed for Code Compliance
Date: 08/16/21
Permit #:
21-055455-REV-01-MT



NOTES:
1. DESIGN AND INSTALLATION OF INSULATION, FLASHING AND ROOFING MEMBRANE BY CONTRACTOR.

1/S4 EXHAUST FAN CONNECTION DETAIL

FAN

REGISTERED PROFESSIONAL ENGINEER
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