Development Services

From Concept to Construction

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APPEAL SUMMARY

Status: Decision Rendered - Held over from ID 23360 (1/8/20) for additional information

Appeal ID: 23419	**Project Address:** 1202 NW Irving St
Hearing Date: 2/5/20	**Appellant Name:** Ruwan Jayaweera, PE
Case No.: M-001	**Appellant Phone:** 5032262921
Appeal Type: Mechanical	**Plans Examiner/Inspector:** Thomas Ng
Project Type: commercial	**Stories:** 9 **Occupancy:** R-1 **Construction Type:** 1-B
Building/Business Name: Proper Hotel	**Fire Sprinklers:** Yes - Throughout
Appeal Involves: Reconsideration of appeal	**LUR or Permit Application No.:** 19-201292-EA
Plan Submitted Option: pdf [File 1] [File 2] [File 3] [File 4]	**Proposed use:** Hotel

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	6.4.3.3.5.1 Guest Room Ventilation Control
Requires	Code Section being appealed: 2019 Oregon Zero Energy Ready Commercial Code (ASHRAE 90.1 2016) Regulation Requirement: 6.4.3.3.5.1 Guest Room Ventilation Control Within 30 minutes of all occupants leaving the guest room, ventilation and exhaust fans shall automatically be turned off, or isolation devices serving each guest room shall automatically shut off the supply of outdoor air to the guest room and shut off exhaust air from the guest room.
Code Modification or Alternate Requested	The proposed design (constant central airflow DOAS systems with heat recovery) is more energy efficient than the baseline code minimum system (non-heat recovery ventilation with direct outside air connections for each guest room and separate exhaust fans for each guest room with shut-off for un-occupied guest rooms). Note that we are assuming that a Code system would be a distributed outside air and exhaust system to avoid the added first cost associated with two shutoff dampers at each guest room required to meet Code with a central system. With a distributed system and assuming the hotel rooms are rented 75% of the time and occupied 18 hours per day (4970 hours), heat recovery is not required per Table 6.5.6.1-1 (less than 8000 hours operating).
Proposed Design	The hotel guest room ventilation system consists of: a) three (3) roof top Dedicated Outdoor Air System (DOAS) air handlers with energy recovery wheels (assumed 60% heat recovery effectiveness for conservative calculations) and VFD controlled fans with premium efficiency motors, b) multiple fully ducted risers and branch ductwork to each guest room for supply air, and

c) multiple return shafts connected to guest rooms via sub-ducts at the shafts to eliminate the need for fire/smoke dampers.

The proposed design is to be running during all occupied hours of operation for the building and continuous ventilation air and exhaust air is to be provided for each guest room. The amount of outdoor air and exhaust air from guest rooms is also higher than code minimum to ensure better indoor air quality.

Energy from the exhaust air is exchanged and transferred to the incoming outdoor air supply inside the DOAS units via heat recovery wheels to further increase the overall efficiency of the system over the baseline code minimum system.

Reason for alternative

Energy analysis were completed for each system (constant airflow DOAS with heat recovery VS. baseline non-heat recovery with exhaust and ventilation shut-off). A summary of the results is provided below. The constant airflow DOAS system with heat recovery performs better than the baseline system and saves approximately 22% more energy on an annual basis.

PROPOSED DESIGN CODE DESIGN
FAN ENERGY (KWH) 195,970 19,469
VENTILATION LOADS (KWH) 952,462 759,102
ENERGY RECOVERED (KWH) (541,600) -TOTAL
VENTILATION ENERGY (KWH) 606,831 778,571

In addition, the quantity of outdoor air supplied to and exhausted from each guest room is about 25% higher than code minimum (50 vs 40 CFM for a typical sized guest room) providing more air changes per hour and therefore providing higher quality indoor air.

To summarize, the proposed system design saves more energy on an annual basis than the baseline system while simultaneously providing better indoor air quality.

RECONSIDERATION TEXT:
Additional information was requested by the city (mechanical plans and calculations supporting the appeal). Please refer to the attached mechanical plans: “2019-10-16_Proper Hotel 100DD Mechanical Set”, cutsheet "6K CFM DOAS ASHP-1-20-20", and stamped cover sheet "Proper Hotel Appeal 23360 Cover Sheet". Note that the online appeal form does not allow the spreadsheet calculation “Heat Recovery Analysis 1-17-2020” to be uploaded. This spreadsheet was emailed directly to reviewer Thomas Ng.

APPEAL DECISION

Use of constant airflow DOAS system in lieu of non-heat recovery system with automatic exhaust and ventilation shut off devices: Granted as proposed.

The Administrative Appeal Board finds that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 90 calendar days of the date this decision is published. For information on the appeals process, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

Memo

Date: January 22, 2020
Project: Proper Hotel
Appeal ID: 23360
To: Thomas Ng
From: Ruwan Jayaweera, PE
Subject: Proper Hotel Mechanical Appeal Calculations

Documents and Calculations for the Proper Hotel mechanical appeal

The following documents are included as backup information for Appeal ID 23260

- Proper Hotel – Energy Recovery Calculations Summary
- Excel file of calculations: *Heat Recovery Analysis-1-17-2020.xlsm*
- Cut sheet of DOAS Unit: *6K CFM DOAS ASHP-1-10-20.pdf*

Professional Engineers Stamp:

Proper Hotel – Energy Recovery Calculation Summary

EQUATIONS USED

1 HP = 745.7 Watts
BHP increase = CFM x SP(in)increase / 6356
F = 9/5*C+32
Wet-bulb formula from 'get psyched' script
Enthalpy from wet bulb from conversion and correction tables per ASHRAE (see Data Tables)
Air density from table via ASHRAE Fundamentals (see Data Tables)
BTUH/3412 = kWh

STEP BY STEP-HOURLY BREAKDOWN FORMULAS

	Date (MM/DD/YYYY)	From TMY3 data
	Time (HH:MM)	From TMY3 data
	RENTED	Randomized 75% occupancy
	OCCUPANCY	Rented-6 hrs off/day (10AM-4PM), not rented-23 hrs off/day
	Dry-bulb (C)	From TMY3 data
	Dry-bulb (F)	F = 9/5*C+32
	Relative Humidity %	From TMY3 data
	Wet Bulb (F)	Wet-bulb formula from 'get psyched' script
	OA Enthalpy + corr (BTU/LB)	Enthalpy from wet bulb from conversion and correction tables per ASHRAE (see Data Tables)
	OA Density (lb/cf)	Air density from dry bulb via ASHRAE Fundamentals table (see Data Tables)
	Indoor density	Air density from dry bulb via ASHRAE Fundamentals table (see Data Tables)
	DOAS Airflow (cf/h)	DOAS design CFM * 60
Recoverable Heating Energy	OCCUPTIED HTG ΔH (BTU/LB)	If occupied, is either 0 or difference between OA and indoor enthalpies
	UNOCCUPTIED HTG ΔH (BTU/LB)	If unoccupied, is either 0 or difference between OA and indoor enthalpies
	HTG ΔH (BTUH)	(BTU/LB ΔH) x (average OA&IA air densities) / (design CFH)
	HTG ΔH (KWH)	BTUH/3412 = kWh
	HTG ΔH WHEN UNOCC (KWH)	if unoccupied shows ΔH
Recoverable Cooling Energy	OCCUPTIED CLG ΔH (BTU/LB)	If occupied, is either 0 or difference between OA and indoor enthalpies
	UNOCCUPTIED CLG ΔH (BTU/LB)	If unoccupied, is either 0 or difference between OA and indoor enthalpies
	CLG ΔH (BTUH)	(BTU/LB ΔH) x (average OA&IA air densities) / (design CFH)
	CLG ΔH (KWH)	BTUH/3412 = kWh
	CLG ΔH IF UNOCC (KWH)	If unoccupied shows ΔH

Recoverable Wheel Energy	50% efficiency (90.1-2016)	Uses 60% efficiency which is closer to actual market options than code minimum. Basis of design unit has 80%(CLG), 65%(HTG) effectiveness selection.
	Enth. Wheel power from FLA (KWH)	0.47 amperage assumption, 460V, 80% motor efficiency. V*A*eff/1000=kW (listed as kWh on hourly analysis)
	TOTAL HEAT RECOVERED (KWH)	Energy recovered - energy consumed by wheel.
OCCUPIED VENTILATION LOAD	HTG (BTU)	Difference between OA and indoor enthalpies when heating
	CLG (BTU)	Difference between OA and indoor enthalpies when cooling
	TOTAL (BTU)	Difference between OA and indoor enthalpies when heating or cooling
	TOTAL (KWH)	BTUH/3412 = kWh

MECHANICAL DRAWING LIST	
SHEET #	SHEET NAME
M0.01	SYMBOLS, LEGENDS AND ABBREVIATIONS - MECHANICAL
M0.02	EQUIPMENT SCHEDULE - MECHANICAL
M0.03	EQUIPMENT SCHEDULE - MECHANICAL
M0.04	EQUIPMENT SCHEDULE - MECHANICAL
M2.00	MECHANICAL PLAN, FLOOR - PARKING
M2.00M	MECHANICAL PLAN, FLOOR - PARKING MEZZANINE
M2.01	MECHANICAL PLAN, FLOOR - LEVEL 1
M2.02	MECHANICAL PLAN, FLOOR - LEVEL 2
M2.03	MECHANICAL PLAN, FLOOR - LEVEL 3-7
M2.08	MECHANICAL PLAN, FLOOR - LEVEL 8
M2.09	MECHANICAL PLAN, FLOOR - LEVEL 9
M2.10	MECHANICAL PLAN, FLOOR - LEVEL 10 MECHANICAL
M2.11	MECHANICAL PLAN, FLOOR - ROOF
M4.00	MECHANICAL DETAILS

STANDARD MECHANICAL ABBREVIATIONS

AF	AIRFOIL	IN	INCH(ES)
AFF	ABOVE FINISHED FLOOR	INSUL	INSULATION
AHP	APPARATUS HOUSING PLENUM	ISOL	ISOLAT(OR)(ION)
ALT	ALTERNATIVE	KW	KILOWATT
AL	ALUMINUM	KWH	KILOWATT HOUR
APD	AIR PRESSURE DROP	L	LENGTH
APPROX	APPROXIMATELY	LAT	LEAVING AIR TEMP
ARCH	ARCHITECT(URAL)	LB	POUND
AUTO	AUTOMATIC	LDB	LEAVING DRY BULB
BDD	BACKDRAFT DAMPER	LF	LINEAR FEET
BHP	BREAK HORSEPOWER	LFT	LEAVING FLUID TEMPERATURE
BI	BACKWARD INCLINED	LVG	LEAVING
BLDG	BUILDING	LWB	LEAVING WET BULB
BSMT	BASEMENT	LWT	LEAVING WATER TEMPERATURE
BTU	BRITISH THERMAL UNIT	MAX	MAXIMUM
BTUH	BRITISH THERMAL UNITS PER HOUR	MBH	THOUSAND BTU PER HOUR
CFH	CUBIC FEET PER HOUR	MCA	MINIMUM CIRCUIT AMPACITY
CFM	CUBIC FEET PER MINUTE	MECH	MECHANICAL
CFS	CUBIC FEET PER SECOND	MERV	MINIMUM EFFICIENCY REPORTING VALUE
CLG	CEILING OR COOLING	MFR	MANUFACTURER
CONC	CONCRETE	MIN	MINIMUM
CONN	CONNECT(ION)	MISC	MISCELLANEOUS
CONT	CONTINUE(ED)(UATION)	MOP	MAXIMUM OVERCURRENT PROTECTION
CL	CENTERLINE	MTD	MOUNTED
DB	DRY BULB	NC	NORMALLY CLOSED
DDC	DIRECT DIGITAL CONTROL	NIC	NOT IN CONTRACT
DEFL	DEFLECTION	NO	NORMALLY OPEN
DN	DOWN	OAD	OUTSIDE AIR DAMPER
DP	DEW POINT	OAT	OUTSIDE AIR TEMPERATURE
DWDI	DOUBLE WIDTH DOUBLE INLET	OC	ON CENTER DISTANCE
DWG	DRAWING	OSA	OUTSIDE AIR
EA	EXHAUST AIR	PH	PHASE
EAD	EXHAUST AIR DAMPER	PP	POLYPROPYLENE
EAT	ENTERING AIR TEMPERATURE	PSI	POUNDS PER SQUARE INCH
ECM	ELECTRONICALLY COMMUTATED MOTOR	PVC	POLYVINYL CHLORIDE
EDB	ENTERING DRY BULB	PVS	PVC COATED STEEL
EFF	EFFICIENCY	R (RAD)	RADIUS
EFT	ENTERING FLUID TEMPERATURE	RA	RETURN AIR
ELEC	ELECTRIC(AL)	RAD	RETURN AIR DAMPER
ELEV	ELEVATION	REV	REVISION
ENGR	ENGINEER	RH	RELATIVE HUMIDITY
EQ	EQUAL	RPM	REVOLUTIONS PER MINUTE
EQUIP	EQUIPMENT	SA	SUPPLY AIR
ESP	EXTERNAL STATIC PRESSURE	SCFM	STANDARD CUBIC FEET PER MINUTE
EWB	ENTERING WET BULB	SD	SMOKE DAMPER
EWT	ENTERING WATER TEMPERATURE	SECT	SECTION
EX	EXTRACTOR	SENS	SENSIBLE
EXH	EXHAUST	SIM	SIMILAR
EXIST	EXISTING	SP	STATIC PRESSURE
EXP	EXPANSION	SPEC	SPECIFICATION
F	DEGREES FAHRENHEIT	SQ	SQUARE
FC	FORWARD CURVED	SF	SQUARE FOOT(FEET)
FIG	FIGURE	SQ IN	SQUARE INCH(ES)
FILT	FILTER	SS	STAINLESS STEEL
FLA	FULL LOAD AMPACITY	STL	STEEL
FLEX	FLEXIBLE	STRUCT	STRUCTURE(E)(AL)
FPD	FLUID PRESSURE DROP	SWP	SINGLE WALL PLENUM
FPM	FEET PER MINUTE	SWSI	SINGLE WIDTH SINGLE INLET
FPS	FEET PER SECOND	TEMP	TEMPERATURE
FT	FEET/FOOT	TSP	TOTAL STATIC PRESSURE
FTR	FINNED TUBE RADIATOR	TYP	TYPICAL
FU	FIXTURE UNIT	V	VOLTS
FUT	FUTURE	VD	VOLUME DAMPER
FV	FACE VELOCITY	VEL	VELOCITY
GA	GAGE/GAUGE	VERT	VERTICAL
GAL	GALLON	VFD	VARIABLE FREQUENCY DRIVE
GALV	GALVANIZED	VTR	VENT THROUGH ROOF
GLY	GLYCOL	W	WIDTH
GPH	GALLONS PER HOUR	WB	WET BULB
GPM	GALLONS PER MINUTE	WG	WATER GAUGE
H	HEIGHT	WPD	WATER PRESSURE DROP
HORIZ	HORIZONTAL	WTD	WATER TEMPERATURE DROP
HP	HORSEPOWER	WTR	WATER TEMPERATURE RISE
HTG	HEATING	W/	WITH
ID	INSIDE(DIAMETER/DIMENSION)	W/0	WITHOUT
IE	INVERT ELEVATION		

HVAC PIPING

D	D	DRAIN (CONDENSATE/INDIRECT)
RS	RS	REFRIGERANT SUCTION
RL	RL	REFRIGERANT LIQUID

CONTROL SYMBOLS

- DAMPER WITH OPERATOR
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- DO — DIGITAL OUTPUT FROM DDC PANEL
- DI — DIGITAL INPUT TO DDC PANEL
- AO — ANALOG OUTPUT FROM DDC PANEL
- AI — ANALOG INPUT TO DDC PANEL
- DP — DIFFERENTIAL PRESSURE SWITCH
- EP — EP VALVE
- SP — STATIC PRESSURE CONTROLLER
- VP — VELOCITY PRESSURE TRANSMITTER
- R — PNEUMATIC RELAY
- ES — DAMPER END SWITCH
- CO — CARBON MONOXIDE SENSOR
- CO2 — CARBON DIOXIDE SENSOR
- AMS — AIR MONITORING STATION
- VPP — VELOCITY PRESSURE PROBE
- PE — PE SWITCH
- SMK — DUCT SMOKE DETECTOR
- WFM — WATER FLOW METER WITH ELECTRONIC TRANSMITTER
- PB — PUSH BUTTON SWITCH
- SM — SWITCHED MAIN AIR
- PT — PRESSURE TRANSMITTER
- M — MAIN AIR
- H — ELECTRONIC HUMIDITY TRANSMITTER
- H HL — DUCT MOUNTED HIGH LIMIT HUMIDISTAT
- T — ELECTRONIC TEMPERATURE SENSOR
- FS — FLOW SWITCH
- T — ELECTRONIC SENSOR WITH AVERAGING

SYMBOLS

A	ACCESS PANEL	K	CAP EXISTING / CAP FOR FUTURE
B	BELOW GRADE / FLOOR	R	RELOCATE EXISTING
C	CONNECT TO EXISTING	X	REMOVE EXISTING
E	EXISTING TO REMAIN	1	NOTE

CALL OUT SYMBOLS

WALL MOUNTED		CO CO	CARBON MONOXIDE
PENDANT MOUNTED		CO2 CO2	CARBON DIOXIDE
T V	TEMPERATURE	NOX NOX	NITROGEN OXIDE
H M	HUMIDITY		

ROOM SENSORS

DUCT LEGEND

CFM / TYPE — FLOW DIRECTION (NONE SHOWN IF 4-WAY)

RETURN EXHAUST SUPPLY

SEE SPEC FOR TYPE
SEE SCHEDULE FOR SIZE

CEILING DIFFUSERS & GRILLES

CFM / SIZE TYPE

TYPE REFERENCE
H = 6" BELOW CEILING
L = 6" ABOVE FLOOR
F = FLOOR
S = SLOT DIFFUSER
C = CEILING
T = DOOR TRANSFER

NECK SIZE (SIDEWALL & FLOOR GRILLE)
PLENUM INLET SIZE (SLOT DIFFUSER)

SIDEWALL, SLOT & FLOOR GRILLES

TU-X-XXX
TERMINAL UNIT NUMBER
FLOOR UNIT IS LOCATED ON
AIR HANDLER NUMBER
TERMINAL UNIT

TERMINAL UNITS

EF-XXX
UNIT NUMBER
FLOOR UNIT IS LOCATED ON
EQUIPMENT TYPE

EQUIPMENT

SUPPLY AIR | RETURN AIR | EXHAUST AIR | OUTSIDE AIR

DUCT SECTIONS

FSD — COMBINATION FIRE/SMOKE
FD — SMOKE
SD — FIRE
AUTOMATIC VOLUME

DAMPERS

RETURN OR EXHAUST AIR FLOW
SUPPLY OR OUTSIDE AIR FLOW

UC 1/2" UNDERCUT DOOR

LOW PRESSURE DUCTWORK

D, R=2D FOR FLEX — SECTION, PLAN — FLEX DUCT

D, R=1-1/2D FOR ROUND — SECTION, PLAN — ROUND DUCT

RETURN OR EXHAUST GRILLE CONNECTION

D, R=2D FOR FLEX — SECTION, PLAN — FLEX DUCT

D, R=1-1/2D FOR ROUND — SECTION, PLAN — ROUND DUCT

SUPPLY DIFFUSER CONNECTION

SECTION, PLAN — RECTANGULAR DUCT — RETURN OR EXHAUST GRILLE

LINED PLENUM — FLEX DUCT — SECTION, PLAN — SQUARE NECK — SPIN-IN FITTING

SUPPLY DIFFUSER SIDE FLEX CONNECTION

SECTION, PLAN — SUPPLY DIFFUSER HARD CONNECTION

SECTION, PLAN — SIDEWALL SUPPLY GRILLE CONNECTION

MEDIUM PRESSURE DUCTWORK

CONICAL TEE | LOW LOSS | LATERAL TEE | CONICAL LATERAL

BRANCH FITTINGS

R=1-1/2D — ELBOW

Y-BRANCH

R= 2D — BELL MOUTH

L=D1-D2 — REDUCER

DUCT DETAILS (LOW VELOCITY)

R=1-1/2W — RADIUS ELBOW

TURNING VANES IN ALL ELBOWS AND TEES — MITER ELBOWS & TEES

FLEX CONNECTION

24x16 — SIZE SHOWN IS CLEAR AIR PASSAGE — ACOUSTICAL LINER

LESS THAN 15° | 15° TO 30° | GREATER THAN 30° — R=1-1/2W

DUCT OFFSETS

30° MAX — RECTANGULAR TO ROUND — 30° MAX

TRANSITIONS

45° — W — 4" MIN OR 1/4W OR 12" MAX

RECTANGULAR DUCT FITTING

SPIN-IN FITTING — CONICAL SPIN-IN FITTING

RECTANGULAR TO ROUND FITTING

GENERAL NOTE

THIS IS A STANDARD LEGEND SHEET, THEREFORE, SOME SYMBOLS MAY APPEAR ON THIS SHEET THAT DO NOT APPEAR ON THE DRAWINGS.

MISC. VALVES & COCKS

- SHUT-OFF VALVE
- GLOBE VALVE
- S — SHUT-OFF VALVE W/ TAMPER SWITCH
- TRIPLE DUTY VALVE
- CHECK VALVE
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- FC — BALANCING VALVE
- FC — FLOW CONTROL VALVE
- SV — SOLENOID VALVE
- PRESSURE REDUCING VALVE
- MAV, AAV — AIR VENT (MANUAL/AUTOMATIC)
- RELIEF VALVE
- STRAINER
- STRAINER W/ BLOWDOWN
- DV — DRAIN VALVE
- HB — HOSE BIBB
- WH — WALL HYDRANT
- G GH — GROUND HYDRANT
- F&T/IB — STEAM TRAP
- PRESSURE GAUGE
- PRESSURE/TEMPERATURE TEST PLUG
- THERMOMETER
- F — FLOW SWITCH
- T — TEMPERATURE TRANSMITTER
- S (SIZE) — SHOCK ARRESTOR
- V — VACUUM BREAKER
- WFM — WATER FLOW METER
- RPBA — REDUCED PRESSURE BACKFLOW ASSEMBLY
- DCVA — DOUBLE CHECK VALVE ASSEMBLY
- DCDA — DOUBLE CHECK DETECTOR ASSEMBLY
- BWV — BACKWATER VALVE
- UG — UNDERGROUND GATE VALVE W/BOX
- PIV — UNDERGROUND GATE W/POST INDICATOR
- OUTSIDE SCREW & YOKE
- Y PATTERN BOILER BLOWDOWN VALVE
- NON-RETURN STOP VALVE
- QUICK OPENING BOILER BLOWDOWN VALVE

MISC. FITTINGS & SYMBOLS

- DIRECTION OF FLOW
- DIRECTION OF SLOPE
- PIPE SLEEVE
- REDUCER
- ANCHOR
- ELBOW (90°)
- ELBOW (45°)
- TEE
- CROSS
- PIPING CONNECTIONS
- JOINT OR COUPLING POINT
- UNION
- FLANGED CONNECTION
- CAP
- PLUG OR BLIND FLANGE
- RISER
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- HORIZONTAL TEE
- FLEXIBLE CONNECTION
- BALL JOINT
- MC — MECHANICAL COUPLING
- HEAT TRACE

NEW AND EXISTING WORK

EXISTING DUCT WORK | NEW DUCT WORK

EXISTING PIPING | NEW PIPING

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CIVIL
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SUITE 2500
T 503-227-3251

MEP (BOD)
PAE CONSULTING ENGINEERS
522 SW FIFTH AVENUE
SUITE 1500
T 503-226-2921

LIGHTING DESIGN
LUMA
522 SW FIFTH AVENUE
SUITE 1500
T 503-226-2921

Revisions

PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

SYMBOLS, LEGENDS AND ABBREVIATIONS - MECHANICAL

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M0.01

100% DD

10/16/2019 12:11:15 PM

DESIGN CONDITIONS - PORTLAND, OR

SPACE	WINTER		SUMMER	
	TEMPERATURE	HUMIDITY	TEMPERATURE	HUMIDITY
OUTDOOR	25.2˚ F DB	9.6˚ F DP / 9.0 HR / 29.8 ˚ F MCDB	91.4˚ F DB / 67.3˚ F MCWB	63.2˚ F DP / 87.0 HR / 75.1˚ F MCDB
INDOOR	70˚ F ± 2˚ F DB	50% RH MAX, NO MINIMUM	75˚ F ± 2˚ F DB	50% RH MAX, NO MINIMUM

GENERAL NOTES:
A. OUTDOOR CONDITIONS BASED ON ASHRAE FUNDAMENTALS 2013 99.6% AND 0.4% DATA.

UNIT HEATER SCHEDULE

TAG	LOCATION SERVICE	TYPE	ELECTRICAL: ELEC. COIL CAPACITY (kW)	ELECTRICAL: VOLT/ PHASE	ELECTRICAL: MOCP (A)	ELECTRICAL: MCA (A)	GEN. POWER (Y/N)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
UH-P01	STAIR 1	VERTICAL RECESSED	5	208/1					TRANE	1
UH-P02	STAIR 2	VERTICAL RECESSED	5	208/1					TRANE	1
UH-P03	BIKE STORAGE	VERTICAL RECESSED	5	208/1					TRANE	1
UH-P04	WATER ENTRY	VERTICAL RECESSED	3	208/1					TRANE	1
UH-P05	STORAGE	HORIZONTAL CABINET	5	208/1					TRANE	1
UH-101	VESTIBULE 102	VERTICAL RECESSED	3	208/1					TRANE	1
UH-102	GENERATOR	VERTICAL CABINET	12	208/1					TRANE	1
UH-103	TRASH/LOADING	HORIZONTAL CABINET	12	208/1					TRANE	1
UH-104	EAST EXIT CORRIDOR	HORIZONTAL RECESSED	3	208/1					TRANE	1
UH-1001	MECH PENTHOUSE	HORIZONTAL CABINET	12	208/1					TRANE	1

GENERAL NOTES:
A.
NOTES:
1. UNIT MOUNTED THERMOSTAT; SET TO 50 °F

DIFFUSERS AND GRILLES

TAG	TYPE	DESCRIPTION	AIRFLOW RANGE: MIN (CFM)	AIRFLOW RANGE: MAX (CFM)	INLET SIZE (IN)	FACE SIZE: T-BAR (IN)	FACE SIZE: HARD LID (IN)	MAX NC	THROW (FT)	MANUFACTURER & MODEL	NOTES
C-1	CEILING SUPPLY DIFFUSER	PERFORATED FACE, MODULAR CORE, ADJUSTABLE 4-WAY THROW	0	125	6x6	24x24	13x13	12	2-2-5	TITUS PMC	
			126	220	8x8	24x24	15x15	17	2-3-6		
			221	345	10x10	24x24	17x17	21	3-4-8		
			346	500	12x12	24x24	19x19	24	3-5-9		
			501	780	16x16	24x24	23x23	28	4-6-11		
C-2	CEILING RETURN/ EXHAUST GRILLE	PERFORATED FACE, STEEL, ROUND DUCT CONNECTION	0	340	10x10	24x24	12x12	17	-	TITUS PAR	
			341	780	15x15	24x24	17x17	22	-		
			781	1,125	18x18	24x24	20x20	24	-		
			1,129	1,670	22x22	24x24	24x24	26	-		
			1,671	3,500	22x46	24x48	24x48	25	-		
S-1	CEILING SUPPLY DIFFUSER	SLOT, FIXED BLADE, INSULATED PLENUM, ADJUSTABLE THROW	0	80	6	24x2	24x2	20	10-15-23	TITUS TBDI-10	1
			81	120	6	48x2	48x2	17	9-16-28		1
			121	180	8	48x2	48x2	25	16-24-34		1
			181	325	10	48x4	48x4	26	21-32-46		2

GENERAL NOTES:
A. NOISE CRITERIA (NC) BASED ON ROOM ABSORPTION OF 10 dB, MEASURED PER ANSI/ASHRAE STANDARD 70.
B. THROW VALUES GIVEN FOR TERMINAL VELOCITIES 150, 100, AND 50 FPM FOR ISOTHERMAL CONDITIONS.
C. ADJUST THROW DIRECTION AND QUANTITY PRIOR TO AIR BALANCING.
NOTES:
1. ONE 1-INCH SLOT.
2. TWO 1-INCH SLOTS.

ERV SCHEDULE

			ERV-101
TAG NUMBER			
LOCATION			LOADING
SERVICE			VENTILATION L1 & MEZZ
OUTSIDE AIR	DESIGN OSA	CFM	1,200
	CODE MIN OSA	CFM	1,150
	PRE-FILTER MERV RATING		8
	FINAL FILTER MERV RATING		-
SUPPLY FAN	QUANTITY		1
	AIRFLOW	CFM	1,200
	FAN TYPE		
	TSP	(IN. WG.)	
	ESP	(IN. WG.)	
	FAN RPM		
	MOTOR BHP		
	MOTOR HP		1.5
	VOLT/PHASE		460/3
	VFD		VFD
EXHAUST FAN	QUANTITY		1
	AIRFLOW	CFM	1,200
	FAN TYPE		
	TSP	(IN. WG.)	
	ESP	(IN. WG.)	
	FAN RPM		
	MOTOR BHP		
	MOTOR HP		1.5
	VOLT/PHASE		460/3
	VFD		YES
HEAT RECOVERY SECTION	OSA	CFM	1,200
	EXHAUST	CFM	1,200
	TYPE		STATIC PLATE
	WINTER: OSA EAT	(°F DB)	
	WINTER: OSA LAT	(°F DB)	
	WINTER: EXH EAT	(°F DB)	
	WINTER: EFFECTIVENESS	%	
	SUMMER: OSA EAT	(°F DB/WB)	
	SUMMER: OSA LAT	(°F DB/WB)	
	SUMMER: EXH EAT	(°F DB/WB)	
	SUMMER: EFFECTIVENESS	%	
APPROX. WEIGHT		(LBS)	1,000
MANUFACTURER & MODEL			RENEWAIRE HE2X
NOTES			

GENERAL NOTES:
A. UNITS HUNG, SUPPORTED BY STRUCTURE.
B. MINIMUM OSA CALCULATED BASED ON CODE AND ASHRAE STANDARD 62.
C. PROVIDE SCCR SUFFICIENT TO MEET THE AVAILABLE FAULT CURRENT AT THE... DRAWINGS AND ELECTRICAL CONTRACTOR
D. HEAT RECOVERY SECTION EFFECTIVENESS IS BASED ON AHRI 1060.
NOTES:

AIR HANDLING UNIT SCHEDULE

				DOAS-1001	DOAS-1002	DOAS-1003
TAG NUMBER						
LOCATION				ROOF	ROOF	ROOF
SERVICE				WEST HOTEL ROOMS	EAST HOTEL ROOMS	CENTRAL HOTEL ROOMS
TYPE				MULTIZONE	MULTIZONE	MULTIZONE
MIXING BOX	DESIGN OSA		CFM	6,000	6,000	7,000
	CODE MIN OSA		CFM	5,600	5,900	6,900
	PRE-FILTER MERV RATING			8	8	8
	FINAL FILTER MERV RATING			13	13	13
SUPPLY FAN	QUANTITY			1	1	1
	AIRFLOW		CFM	6,000	6,000	7,000
	FAN TYPE					
	TSP		(IN. WG.)			
	ESP		(IN. WG.)			
	FAN RPM					
	MOTOR BHP					
	MOTOR HP			7.5	7.5	7.5
	VOLT/PHASE			460/3	460/3	460/3
	VFD			YES	YES	YES
EXHAUST FAN	QUANTITY			1	1	1
	AIRFLOW		CFM	6,000	6,000	7,000
	FAN TYPE					
	TSP		(IN. WG.)			
	ESP		(IN. WG.)			
	FAN RPM					
	MOTOR BHP					
	MOTOR HP			7.5	7.5	7.5
	VOLT/PHASE			460/3	460/3	460/3
	VFD			YES	YES	YES
AIR COOLED CONDENSER FAN	QUANTITY			2	2	2
	FAN TYPE					
	FLA			1.8	1.8	1.8
	VOLT/PHASE			460/3	460/3	460/3
HEAT RECOVERY SECTION	OSA		CFM	6,000	6,000	7,000
	EXHAUST		CFM	6,000	6,000	7,000
	TYPE			WHEEL	WHEEL	WHEEL
	FLA			0.47	0.47	0.47
	VOLT/PHASE			460/3	460/3	460/3
	WINTER	OSA EAT	(°F DB)			
		OSA LAT	(°F DB)			
		EXH EAT	(°F DB)			
		EFFECTIVENESS	%			
	SUMMER	OSA EAT	(°F DB/WB)			
		OSA LAT	(°F DB/WB)			
		EXH EAT	(°F DB/WB)			
		EFFECTIVENESS	%			
ELECTRIC HEATING COIL	KW			20	20	20
	CONTROL					
	EAT		(°F)			
	LAT		(°F)			
	FLA			24.1	24.1	24.1
	VOLT/PHASE			460/3	460/3	460/3
REFRIGERANT COIL	HEATING	EAT	(°F DB/WB)			
		LAT	(°F DB/WB)			
	COOLING	EAT	(°F DB/WB)			
		LAT	(°F DB/WB)			
	EER					
	REFRIGERANT			R-410A	R-410A	R-410A
APPROX. WEIGHT			(LBS/ SYSTEM)	4,000	4000	4,000
MANUFACTURER & MODEL				AAON RN	AAON RN	AAON RN
NOTES						

GENERAL NOTES:
A. UNITS MOUNTED ON VIBRATION ISOLATING ROOF CURB.
B. MINIMUM OSA CALCULATED BASED ON OREGON MECHANICAL SPECIALTY CODE AND ASHRAE STANDARD 62.
C. HEATING COILS BASED ON MAXIMUM FACE VELOCITY OF 750 FPM, 0.15 IN WG MAXIMUM AIR PRESSURE DROP.
D. COOLING COILS BASED ON MAXIMUM FACE VELOCITY OF 500 FPM, 0.75 IN WG MAXIMUM AIR PRESSURE DROP.
E. PROVIDE SCCR SUFFICIENT TO MEET THE AVAILABLE FAULT CURRENT AT THE PANELBOARD OR SWITCHBOARD FROM WHICH THE UNIT IS FED, OR AS OTHERWISE INDICATED ON THE MECHANICAL EQUIPMENT CONNECTION SCHEDULES....
F. HEAT RECOVERY SECTION EFFECTIVENESS IS BASED ON AHRI 1060.
NOTES:
1. ARRANGE UNIT FOR SINGLE POINT POWER CONNECTION W/ DISCONNECT SWITCH. PROVIDE A SEPARATE, DEDICATED 120V CONNECTION FOR RECEPTACLE(S) AND LIGHTS.

MAKE-UP AIR UNIT SCHEDULE

TAG	LOCATION	SERVICE	FILTERS: PRE (MERV)	FILTERS: FINAL (MERV)	SUPPLY FAN: AIRFLOW MAX (CFM)	SUPPLY FAN: AIRFLOW MIN (CFM)	SUPPLY FAN: FAN TYPE	SUPPLY FAN: RATING (HP)	SUPPLY FAN: VOLT/ PHASE	SUPPLY FAN: VFD (Y/N)	SUPPLY FAN: VFD QTY	ELECTRIC HEATING COIL: CAPACITY (KW)	ELECTRIC HEATING COIL: CONTROL	ELECTRIC HEATING COIL: EAT (°F)	ELECTRIC HEATING COIL: LAT (°F)	ELECTRIC HEATING COIL: FLA	ELECTRIC HEATING COIL: VOLT/ PHASE	ELECTRICAL: VOLT/ PHASE	ELECTRICAL: FLA (A)	ELECTRICAL: MCA (A)	ELECTRICAL: MOCP (A)	ELECTRICAL: SCCR (A)	ELECTRICAL: GEN. POWER (Y/N)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
MAU-101	LEVEL 1	KITCHEN	8	13	6,000																				GREENHECK MSX	1
MAU-1001	ROOF	KITCHEN	8	13	3,000																				GREENHECK MSX	1

GENERAL NOTES:
A. UNITS MOUNTED ON SUPPLEMENTARY STRUCTURE WITH VIBRATION ISOLATION.
B. HEATING COILS BASED ON MAXIMUM FACE VELOCITY OF 750 FPM, 0.15 IN WG MAXIMUM AIR PRESSURE DROP.
C. COOLING COILS BASED ON MAXIMUM FACE VELOCITY OF 500 FPM, 0.75 IN WG MAXIMUM AIR PRESSURE DROP.
D. PROVIDE DUCT SMOKE DETECTOR. INTERLOCK DETECTOR WITH ELECTRICAL SERVICE TO DE-ENERGIZE UNIT UPON DETECTION OF SMOKE.
E. PROVIDE FLEXIBLE EQUIPMENT CONNECTION AT DUCT CONNECTIONS.
NOTES:
1. ARRANGE UNIT FOR SINGLE POINT POWER CONNECTION W/ DISCONNECT SWITCH. PROVIDE A SEPARATE, DEDICATED 120V CONNECTION FOR RECEPTACLE(S) AND LIGHTS.
4. UNIT SPEED CONTROL BY DDC SYSTEM.

SILENCER SCHEDULE

TAG	SERVICE	TYPE	DIRECTION	AIRFLOW (CFM)	MAX TSP (IN WG)	DYNAMIC INSERTION LOSS (dB) AT OCTAVE BAND: 63 HZ	125 HZ	250 HZ	500 HZ	1,000 HZ	2,000 HZ	4,000 HZ	8,000 HZ	SIZE: WIDTH (IN)	HEIGHT (IN)	LENGTH (IN)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
SIL-101	GENERATOR INTAKE	INLINE	FORWARD	19,000	0.16											36	500	VIBRO-ACOUSTICS RD-HV	
SIL-102	GENERATOR OUTLET	ELBOW	REVERSE	19,000	0.16											36	500	VIBRO-ACOUSTICS RD-HV	
SIL-1001	DOAS-1001 RETURN	ELBOW	REVERSE	6,000	0.16											36	500	VIBRO-ACOUSTICS RD-HV	
SIL-1002	DOAS-1002 RETURN	ELBOW	REVERSE	6,000	0.16											36	500	VIBRO-ACOUSTICS RD-HV	
SIL-1003	DOAS-1003 RETURN	ELBOW	REVERSE	7,000	0.16											36	500	VIBRO-ACOUSTICS RD-MV	

GENERAL NOTES:
A. DIRECTION INDICATES PERFORMANCE RELATIVE TO AIRFLOW DIRECTION. FORWARD INDICATES NOISE AND AIRFLOW MOVE IN THE SAME DIRECTION, REVERSE INDICATES NOISE AND AIRFLOW MOVE IN OPPOSITE DIRECTIONS.
B. PERFORMANCE DATA OBTAINED IN ACCORDANCE WITH ASTM E477 UNDER IDEAL FLOW CONDITIONS.
NOTES:
1. HIGH VELOCITY SILENCER: MAXIMUM FACE VELOCITY OF 2,000 FPM.
2. MEDIUM VELOCITY SILENCER: MAXIMUM FACE VELOCITY OF 1,200 FPM.
3. LOW VELOCITY SILENCER: MAXIMUM FACEVELOCITY OF 750 FPM.

FAN SCHEDULE

TAG	LOCATION	SERVICE	TYPE	AIRFLOW: MAX (CFM)	AIRFLOW: MIN (CFM)	TSP (IN WG)	FAN SPEED (RPM)	ELECTRICAL: VOLT/ PHASE	HP	VFD (Y/N)	GEN. POWER (Y/N)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
EF-P01	LEVEL P1 FAN RM	GARAGE	INLINE	15,000	-	1.5	2,672	460/3	15.00	Y	Y	555	GREENHECK AFDW	
SF-101	LEVEL 1 GEN RM	GENERATOR COOLING	INLINE	19,300	-	0.75	761	460/3	10.00	Y	Y	725	GREENHECK BSQ	
EF-101	TRASHROOM	TRASHROOM	INLINE	500	-	1.0	1,950	460/3	3/4	ECM	NO	100	GREENHECK SQ	
EF-1001	ROOF	LEVEL 1 DISHWASHER	UPBLAST	1,200	-	0.5	1,672	120/1	1/3	NO	NO	100	GREENHECK CUBE	
EF-1002	ROOF	LAUNDRY	ROOFTOP	1,000	-	1.0	1,423	460/3	1/2	ECM	NO	100	GREENHECK or ENERVEX	
EF-1003	ROOF	LEVEL 1 BAR RR & HSKP WEST	ROOFTOP	2,410	-	1.5	1,429	460/3	2.0	ECM	NO	100	GREENHECK VG	
EF-1004	ROOF	LEVEL 1 & 9 RESTROOMS EAST	ROOFTOP	1,840	-	1.0	1,678	460/3	3/4	ECM	NO	100	GREENHECK VG	
KEF-1001	ROOF	LEVEL 1 GREASE EXHAUST	UPBLAST	6,000	-	0.5	1,193	460/3	2.00	NO	NO	350	GREENHECK USGF	
KEF-1002	ROOF	LEVEL 9 GREASE EXHAUST	UPBLAST	3,000	-	0.5	1,215	460/3	3/4	NO	NO	200	GREENHECK USGF	
PRF-1001	ROOF	WEST CORRIDOR RELIEF	UTILITY SET	30,000	-	1.25	2,390	460/3	20.00	Y	Y	1,100	GREENHECK CSW	
PRF-1002	ROOF	EAST CORRIDOR RELIEF	UTILITY SET	30,000	-	1.25	2,390	460/3	20.00	Y	Y	1,100	GREENHECK CSW	
SPF-1001	ROOF	WEST STAIRWELL PRESSURIZATION	UTILITY SET	10,000	-	1.25	642	460/3	5.00	Y	Y	1,015	GREENHECK USF	
SPF-1002	ROOF	EAST STAIRWELL PRESSURIZATION	UTILITY SET	10,000	-	1.25	642	460/3	5.00	Y	Y	1,015	GREENHECK USF	
EPF-1001	ROOF	PUBLIC ELEVATORS PRESSURIZATION	UTILITY SET	50,000	-	1.0	797	460/3	30.00	Y	Y	2,050	GREENHECK USF	
EPF-1002	ROOF	SERVICE ELEVATOR PRESSURIZATION	UTILITY SET	15,000	-	1.0	611	460/3	5.00	Y	Y	1,300	GREENHECK USF	

GENERAL NOTES:
A. NONE.
NOTES:
1. EC MOTOR.
2. NONE.

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SUITE 2500
T 503-227-3251

MEP (BOD)
PAE CONSULTING ENGINEERS
522 SW FIFTH AVENUE
SUITE 1500
T 503-226-2921

LIGHTING DESIGN
LUMA
522 SW FIFTH AVENUE
SUITE 1500
T 503-226-2921

Revisions

PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

EQUIPMENT SCHEDULE - MECHANICAL

Date: 10.18.19
Job No: 23725.irvi
Drawn By: Author
Checked By: Checker

Drawing No.

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VRF INDOOR UNIT SCHEDULE

TAG	UNIT QUANTITY	OUTDOOR UNIT	LOCATION	SERVICE	TYPE	AIRFLOW (CFM)	COOLING TOTAL (BTU/h)	COOLING SENSIBLE (BTU/h)	HEATING TOTAL (BTU/h)	ELECTRICAL VOLT/ PHASE	ELECTRICAL RLA (A)	GEN. POWER (Y/N)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
FCU-P01	1	ACCU-1001	LEVEL P	ENGINEERING	4-WAY CASSETTE		13352	10307	17100	208/1	0.2		60	LG ARNU	
FCU-P02	1	ACCU-1001	LEVEL P	IT	4-WAY CASSETTE		10682	8239	13649	208/1	0.2		60	LG ARNU	
FCU-P03	1	ACCU-1001	LEVEL P	F & B STORAGE	4-WAY CASSETTE		10682	8239	13649	208/1	0.2		60	LG ARNU	
FCU-P04	1	ACCU-1018	LEVEL P	FIRE PUMP	WALL MOUNTED		12300		13600	208/1	0.3	Y	30	LG ARNU	
FCU-P05	1	ACCU-1018	LEVEL P	ELECTRICAL	WALL MOUNTED		12300		13600	208/1	0.3	Y	30	LG ARNU	
FCU-M01	1	ACCU-1001	LEVEL M	GEN MGR	4-WAY CASSETTE		4747	3541	6100	208/1	0.2		60	LG ARNU	
FCU-M02	1	ACCU-1001	LEVEL M	HR	4-WAY CASSETTE		4747	3541	6100	208/1	0.2		60	LG ARNU	
FCU-M03	1	ACCU-1001	LEVEL M	OPEN OFFICE	DUCTED		10696	8968	13600	208/1	2.3		60	LG ARNU	
FCU-M04	1	ACCU-1001	LEVEL M	ACCOUNTING	4-WAY CASSETTE		4747	3541	6100	208/1	0.2		60	LG ARNU	
FCU-M05	1	ACCU-1001	LEVEL M	LINEN	DUCTED		8348	7074	10900	208/1	2.3		60	LG ARNU	
FCU-M06	1	ACCU-1001	LEVEL M	LOCKER B	DUCTED		6522	5562	8500	208/1	2.3		60	LG ARNU	
FCU-M07	1	ACCU-1001	LEVEL M	LOCKER A	DUCTED		6522	5562	8500	208/1	2.3		60	LG ARNU	
FCU-M08	1	ACCU-1001	LEVEL M	UNIFORM	4-WAY CASSETTE		4747	3541	6100	208/1	0.2		60	LG ARNU	
FCU-M09	1	ACCU-1001	LEVEL M	CONF	4-WAY CASSETTE		6528	5056	8500	208/1	0.2		60	LG ARNU	
FCU-M10	1	ACCU-1001	LEVEL M	F&B STORAGE	DUCTED		8348	7074	10900	208/1	2.3		60	LG ARNU	
FCU-M11	1	ACCU-1018	LEVEL M	TELE/ELEC	DUCTED		10696	8968	13600	208/1	2.3	Y	60	LG ARNU	
FCU-102	1	ACCU-1018	LEVEL 1	FCC	DUCTED		13392	11310	17100	208/1	2.3	Y	60	LG ARNU	
FCU-103	1	ACCU-1002	LEVEL 1	BAR/LOUNGE A	DUCTED		36523	28982	47000	208/1	2.3		60	LG ARNU	
FCU-104	1	ACCU-1002	LEVEL 1	BAR/LOUNGE B	DUCTED		36523	28982	47000	208/1	2.3		60	LG ARNU	
FCU-105	1	ACCU-1002	LEVEL 1	HOTEL LOBBY	DUCTED		36523	28982	47000	208/1	2.3		60	LG ARNU	
FCU-106	1	ACCU-1002	LEVEL 1	RECEPTION	DUCTED		6522	5562	8500	208/1	2.3		60	LG ARNU	
FCU-107	1	ACCU-1002	LEVEL 1	LOBBY SUPPORT	4-WAY CASSETTE		4748	3541	6100	208/1	0.2		60	LG ARNU	
FCU-108	1	ACCU-1002	LEVEL 1	KITCHEN	DUCTED		83081	62499	107500	208/1	5.2		60	LG ARNU	
FCU-109	1	ACCU-1002	LEVEL 1	DINING A	DUCTED		31479	24913	40600	208/1	2.3		60	LG ARNU	
FCU-110	1	ACCU-1002	LEVEL 1	DINING B	DUCTED		31479	24913	40600	208/1	2.3		60	LG ARNU	
FCU-111	1	ACCU-1002	LEVEL 1	EVENT LOBBY	DUCTED		83081	62499	107500	208/1	2.3		60	LG ARNU	
FCU-112	1	ACCU-1002	LEVEL 1	EVENT A	DUCTED		16609	13863	21500	208/1	2.3		60	LG ARNU	
FCU-113	1	ACCU-1002	LEVEL 1	EVENT B	DUCTED		16609	13863	21500	208/1	2.3		60	LG ARNU	
FCU-114	1	ACCU-1002	LEVEL 1	SEC/ELEC	DUCTED		8348	7074	10900	208/1	2.3		60	LG ARNU	
FCU-115	1	ACCU-1002	LEVEL 1	HSKP	DUCTED		13392	11310	17100	208/1	2.3		60	LG ARNU	
FCU-116	1	ACCU-1002	LEVEL 1	BREAK	DUCTED		13392	11310	17100	208/1	2.3		60	LG ARNU	
FCU-117	1	ACCU-1002	LEVEL 1	PREP	DUCTED		13392	11310	17100	208/1	2.3		60	LG ARNU	
FCU-201	1	ACCU-1003	LEVEL 2	FITNESS	DUCTED		36522	28981	47000	208/1	2.3		60	LG ARNU	
FCU-301	1	ACCU-1019	LEVEL 3	TELCO	WALL MOUNTED		12300		13600	208/1	0.3		30	LG ARNU	
FCU-501	1	ACCU-1019	LEVEL 5	TELCO	WALL MOUNTED		12300		13600	208/1	0.3		30	LG ARNU	
FCU-701	1	ACCU-1019	LEVEL 7	TELCO	WALL MOUNTED		12300		13600	208/1	0.3		30	LG ARNU	
FCU-914	1	ACCU-1019	LEVEL 9	TELCO	WALL MOUNTED		12300		13600	208/1	0.3		30	LG ARNU	
FCU-901	1	ACCU-1017	LEVEL 9	EVENTS LOBBY	DUCTED		46962	39281	61400	208/1	2.5		60	LG ARNU	
FCU-902	1	ACCU-1017	LEVEL 9	EVENTS	DUCTED		23481	19641	30700	208/1	2.3		60	LG ARNU	
FCU-903	1	ACCU-1017	LEVEL 9	EVENTS	DUCTED		23481	19641	30700	208/1	2.3		60	LG ARNU	
FCU-904	1	ACCU-1017	LEVEL 9	BAR	DUCTED		46962	39281	61400	208/1	2.5		60	LG ARNU	
FCU-905	1	ACCU-1017	LEVEL 9	BAR	DUCTED		46962	39281	61400	208/1	2.5		60	LG ARNU	
FCU-906	1	ACCU-1017	LEVEL 9	BAR	DUCTED		46962	39281	61400	208/1	2.5		60	LG ARNU	
FCU-907	1	ACCU-1017	LEVEL 9	DINING 908	DUCTED		31482	24915	40600	208/1	2.3		60	LG ARNU	
FCU-908	1	ACCU-1017	LEVEL 9	DINING 908	DUCTED		31482	24915	40600	208/1	2.3		60	LG ARNU	
FCU-909	1	ACCU-1017	LEVEL 9	DINING 908	DUCTED		31482	24915	40600	208/1	2.3		60	LG ARNU	
FCU-910	1	ACCU-1017	LEVEL 9	KITCHEN A	DUCTED		31482	24915	40600	208/1	2.3		60	LG ARNU	
FCU-911	1	ACCU-1017	LEVEL 9	KITCHEN B	DUCTED		31482	24915	40600	208/1	2.3		60	LG ARNU	
FCU-912	1	ACCU-1017	LEVEL 9	DINING 909	DUCTED		16611	13864	21500	208/1	2.3		60	LG ARNU	
FCU-913	1	ACCU-1017	LEVEL 9	DINING 910	DUCTED		21046	17539	27300	208/1	2.3		60	LG ARNU	
FCU-1001	1	ACCU-1018	LEVEL 10	ELEVATOR	WALL MOUNTED		12300		13600	208/1	0.3	Y	30	LG ARNU	
FCU-A	59	VARIES	LEVEL 2-8	GUEST ROOM - NORTH	DUCTED		6528	5104	8500	208/1	0.4		60	LG ARNU	
FCU-B	42	VARIES	LEVEL 2-8	GUEST ROOM - EAST	DUCTED		10682	8391	13600	208/1	0.8		60	LG ARNU	
FCU-C	105	VARIES	LEVEL 2-8	GUEST ROOM - SOUTH & WEST	DUCTED		13352	10458	17100	208/1	0.8		60	LG ARNU	
FCU-D	6	VARIES	LEVEL 2-8	JR SUITE - WEST	DUCTED		24348	19306	31500	208/1	2.3		60	LG ARNU	
FCU-E	8	VARIES	LEVEL 2-8	1 BR SUITE - EAST	DUCTED		24348	20893	31500	208/1	2.5		60	LG ARNU	
FCU-F	1	VARIES	LEVEL 8	SUITE 809	DUCTED		36522	28981	47000	208/1	2.3		60	LG ARNU	

GENERAL NOTES:

A. MINIMUM EFFICIENCY IS AT ARI STANDARD CONDITIONS.

B. ALL DUCTED AND CASSETTE UNITS ARE PROVIDED WITH AN INTEGRAL CONDENSATE PUMP CAPABLE OF 27 IN WG OF LIFT.

C. ALL FAN MOTORS ARE EC TYPE

D. DUCTWORK CONNECTED TO DUCTED FAN-COIL UNITS IS LOW PRESSURE

E. MINIMUM AND MAXIMUM ALLOWABLE SUPPLY AIR TEMPERATURES ARE 55°F AND 105°F, RESPECTIVELY.

NOTES:

1. PROVIDE WITH CASSETTE COVER; BASIS OF DESIGN: LG PTDCM
2. PROVIDE WITH AUXILLARY CONDENSATE PUMP
3. PROVIDE UNIT WITH A MINIMUM OF TWO STAGES OF FAN SPEED CONTROL. MINIMUM FAN SPEED CAN BE NO GREATER THAN 66% OF FULL SPEED.

VRF OUTDOOR UNIT SCHEDULE

TAG	LOCATION	SERVICE	RATED CAPACITY COOLING (MBH)	RATED CAPACITY HEATING (MBH)	MIN EFFICIENCY COOLING IEER(SEER)	MIN EFFICIENCY HEATING COP	REFRIGERANT TYPE	REFRIGERANT CHARGE (LBS)	ELECTRICAL VOLT/ PHASE	ELECTRICAL MCA (A)	ELECTRICAL MCP (A)	GEN. POWER (Y/N)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
ACCU-1001	ROOF	LOWER LEVELS	96	108	33.0	4.33	R410A		460/3	16.4	25		1,200	LG ARUM	
ACCU-1002	ROOF	LEVEL 1	408	459	18.8	3.34	R410A		460/3	35.7+38.3	100		1,200	LG ARUM	
ACCU-1003	ROOF	LEVEL 2 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1004	ROOF	LEVEL 2 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1005	ROOF	LEVEL 3 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1006	ROOF	LEVEL 3 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1007	ROOF	LEVEL 4 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1008	ROOF	LEVEL 4 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1009	ROOF	LEVEL 5 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1010	ROOF	LEVEL 5 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1011	ROOF	LEVEL 6 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1012	ROOF	LEVEL 6 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1013	ROOF	LEVEL 7 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1014	ROOF	LEVEL 7 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1015	ROOF	LEVEL 8 WEST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1016	ROOF	LEVEL 8 EAST	192	216	25.9	3.75	R410A		460/3	35.7	50		1,200	LG ARUM	
ACCU-1017	ROOF	LEVEL 9	480	540	19.0	3.21	R410A		460/3	18.4+26.4+38.3	110		1,200	LG ARUM	
ACCU-1018	ROOF	UNITS ON GEN	96	108	33.0	4.33	R410A		460/3	16.4	25	Y	1,200	LG ARUM	
ACCU-1019	ROOF	TELCO	72	81			R410A		460/3	12.8	20		1,200	LG ARUM	

GENERAL NOTES:

A. MINIMUM EFFICIENCY IS AT AHRI STANDARD CONDITIONS.

B. SIZE REFRIGERANT PIPING PER MANUFACTURER'S INSTRUCTIONS.

C. REFRIGERANT CHARGE INDICATED IS FOR THE EQUIPMENT ONLY. PROVIDE NECESSARY REFRIGERANT QUANTITY TO MEET THE REQUIREMENTS FOR THE SPECIFIC INSTALLATION.

D. SUPLEMENTAL HEATING IS AUTOMATICALLY DISABLED AT OA TEMPERATURES ABOVE 40°F

NOTES:

1. UNIT COMPRISED OF 2 MODULES WITH SEPARATE ELECTRICAL CONNECTIONS & DISCONNECTS. SEE ELECTRICAL SHEETS FOR COORDINATION.
2. UNIT COMPRISED OF 3 MODULES WITH SEPARATE ELECTRICAL CONNECTIONS & DISCONNECTS. SEE ELECTRICAL SHEETS FOR COORDINATION.

VRF HEAT RECOVERY BOX SCHEDULE

TAG	UNIT QUANTITY	PIPING PORT QUANTITY	OUTDOOR UNIT	LOCATION	ELECTRICAL VOLT/ PHASE	ELECTRICAL RLA (A)	GEN. POWER (Y/N)	APPROX. WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
HRB-A	7	2	VARIES	VARIES	208/1	0.10		50	LG PRHR023A	
HRB-B	4	3	VARIES	VARIES	208/1	0.15		50	LG PRHR033A	
HRB-C	1	4	VARIES	VARIES	208/1	0.20		50	LG PRHR043A	
HRB-D	4	6	VARIES	VARIES	208/1	0.20		50	LG PRHR063A	
HRB-E	28	8	VARIES	VARIES	208/1	0.20		50	LG PRHR083A	

GENERAL NOTES:

A. PROVIDE ISOLATION BALL VALVES FOR EACH REFRIGERANT BRANCH.

B. SIZE REFRIGERANT PIPING PER MANUFACTURER'S INSTRUCTIONS.

NOTES:

1. NONE

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T 503-226-2921

LIGHTING DESIGN

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Revisions

PORTLAND PROPER HOTEL

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EQUIPMENT SCHEDULE - MECHANICAL

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VENTILATION SCHEDULE - MULTIPLE SPACES - OREGON

DOAS-1001

LOCATION	TOTAL ZONES	ZONE FLOOR AREA (SF)	ZONE PRIMARY AIRFLOW RATE (CFM)	OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE Rp (CFM/PERSON)	AREA OUTDOOR AIRFLOW RATE Ra (CFM/SF)	DEFAULT OCCUPANT DENSITY (PEOPLE/1000SF)	ZONE CODE POPULATION	ZONE DESIGN POPULATION	TOTAL DESIGN POPULATION	OUTDOOR AIRFLOW RATE Vbz (CFM)	ZONE AIR DISTRIBUTION EFFECTIVENESS Ez	ZONE OUTDOOR AIR INTAKE Voz (CFM)	ZONE DESIGN OUTDOOR AIR INTAKE (CFM)	TOTAL OUTDOOR AIR INTAKE Voz (CFM)	TOTAL DESIGN OUTDOOR AIR INTAKE (CFM)	NOTES
JR SUITE	12	486	535	Bedroom/living room	5	0.06	10	4.9	4.0	48	49.2	0.8	62	62	744	744	
SUITE 809	1	1170	1287	Bedroom/living room	5	0.06	10	11.7	8.0	8	110.2	0.8	138	138	138	138	
STANDARD ROOM	62	280	308	Bedroom/living room	5	0.06	10	2.8	4.0	248	36.8	0.8	46	46	2852	2852	
CORRIDOR FLOOR 2-8	7	622	684	Corridors	--	0.06	--	0.0	-	-	37.3	0.8	47	47	329	329	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Events Lobby L9	1	862	948	Lobbies/prefunction	8	0.06	30	25.9	25.0	25	239.2	0.8	300	300	300	300	
Events Storage L9	1	204	224	Storage rooms	--	0.12	--	0.0	-	-	24.5	0.8	31	31	31	31	
Pool Equip. L9	1	240	264	Storage rooms	--	0.12	--	0.0	-	-	28.8	0.8	36	36	36	36	
Events L9 A	1	954	1049	Multipurpose assembly	5	0.06	120	114.5	114.5	114.48	629.6	1.8	350	350	350	350	
Events L9 B	1	769	846	Multipurpose assembly	5	0.06	120	92.3	92.3	92.28	507.5	0.8	635	635	635	635	
CORRIDOR NORTH L9	1	876	964	Corridors	--	0.06	--	0.0	-	-	52.6	0.8	66	66	66	66	
CORRIDOR SOUTH L9	1	486	535	Corridors	--	0.06	--	0.0	-	-	29.2	0.8	37	37	37	37	
TOTALS:										535.76					5518	5518	

TOTAL AIRFLOW: 6000
SYSTEM POPULATION: 402

CODE REQUIRED OUTDOOR AIR INTAKE FLOWRATE - Vot: 5,518
OUTDOOR AIR SUPPLIED: 6,000

GENERAL NOTES:
A. SYSTEM OUTDOOR AIR CALCULATION IS BASED ON THE SECTION 403 OF THE 2014 OREGON MECHANICAL SPECIALTY CODE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR ACTUAL OUTDOOR AIR FLOW RATE.
NOTES:
1. DESIGN OCCUPANCY REPRESENTS THE AVERAGE OCCUPANCY, WHICH IS NOT LESS THAN 1/2 THE CODE OCCUPANCY.

VENTILATION SCHEDULE - MULTIPLE SPACES - OREGON

DOAS-1002

LOCATION	TOTAL ZONES	ZONE FLOOR AREA (SF)	ZONE PRIMARY AIRFLOW RATE (CFM)	OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE Rp (CFM/PERSON)	AREA OUTDOOR AIRFLOW RATE Ra (CFM/SF)	DEFAULT OCCUPANT DENSITY (PEOPLE/1000SF)	ZONE CODE POPULATION	ZONE DESIGN POPULATION	TOTAL DESIGN POPULATION	OUTDOOR AIRFLOW RATE Vbz (CFM)	ZONE AIR DISTRIBUTION EFFECTIVENESS Ez	ZONE OUTDOOR AIR INTAKE Voz (CFM)	ZONE DESIGN OUTDOOR AIR INTAKE (CFM)	TOTAL OUTDOOR AIR INTAKE Voz (CFM)	TOTAL DESIGN OUTDOOR AIR INTAKE (CFM)	NOTES
STANDARD ROOM	70	350	385	Bedroom/living room	5	0.06	10	3.5	4.0	280.0	41.0	0.8	52	52	3640	3640	
1 BR SUITE	7	750	825	Bedroom/living room	5	0.06	10	7.5	4.0	28.0	65.0	0.8	82	82	574	574	
COORIDOR 2-8	7	462	508	Corridors	--	0.06	--	0.0	-	-	27.7	0.8	35	35	245	245	
-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	0	
Dining 908	1	1294	1423	Dining rooms	8	0.18	70	90.6	67.9	67.9	742.4	0.8	929	929	929	929	
Dining 909	1	226	249	Dining rooms	8	0.18	70	15.8	11.9	11.9	129.7	0.8	163	163	163	163	
Dining 910	1	311	342	Dining rooms	8	0.18	70	21.8	16.3	16.3	178.4	0.8	224	224	224	224	
Kitchen L9	1	1629	1792	Kitchens (cooking)b	--	--	--	0.0	10.0	10.0	0.0	0.8	0	0	0	0	
Stoarge L9	1	200	220	Storage rooms	--	0.12	--	0.0	-	-	24.0	0.8	30	30	30	30	
TOTALS:										414					5805	5805	

TOTAL AIRFLOW: 6,000
SYSTEM POPULATION: 311

CODE REQUIRED OUTDOOR AIR INTAKE FLOWRATE - Vot: 5,805
OUTDOOR AIR SUPPLIED: 6,000

GENERAL NOTES:
A. SYSTEM OUTDOOR AIR CALCULATION IS BASED ON THE SECTION 403 OF THE 2014 OREGON MECHANICAL SPECIALTY CODE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR ACTUAL OUTDOOR AIR FLOW RATE.
NOTES:
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VENTILATION SCHEDULE - MULTIPLE SPACES - OREGON

DOAS-1003

LOCATION	TOTAL ZONES	ZONE FLOOR AREA (SF)	ZONE PRIMARY AIRFLOW RATE (CFM)	OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE Rp (CFM/PERSON)	AREA OUTDOOR AIRFLOW RATE Ra (CFM/SF)	DEFAULT OCCUPANT DENSITY (PEOPLE/1000SF)	ZONE CODE POPULATION	ZONE DESIGN POPULATION	TOTAL DESIGN POPULATION	OUTDOOR AIRFLOW RATE Vbz (CFM)	ZONE AIR DISTRIBUTION EFFECTIVENESS Ez	ZONE OUTDOOR AIR INTAKE Voz (CFM)	ZONE DESIGN OUTDOOR AIR INTAKE (CFM)	TOTAL OUTDOOR AIR INTAKE Voz (CFM)	TOTAL DESIGN OUTDOOR AIR INTAKE (CFM)	NOTES
N STANDARD ROOM	39	350	385	Bedroom/living room	5	0.06	10	3.5	4.0	156.0	41.0	0.8	52	52	2028	2028	
FITNESS	1	1450	1595	health club/weight room	20	0.06	10	14.5	15.0	15.0	387.0	0.8	484	484	484	484	
CENTRAL CORRIDOR FLOOR 2-8	7	430	473	Corridors	--	0.06	--	0.0	-	-	25.8	0.8	33	33	231	231	
HOUSEKEEPING	7	135	149	Commercial laundry	25	--	10	1.4	2.0	14.0	50.0	0.8	63	63	441	441	
ELECTRIC	7	75	83	Storage rooms	--	0.12	--	0.0	-	0.0	9.0	0.8	12	12	84	84	
TOTALS:										470.9					6894	6894	

TOTAL AIRFLOW: 7000
SYSTEM POPULATION: 353

CODE REQUIRED OUTDOOR AIR INTAKE FLOWRATE - Vot: 6,894
OUTDOOR AIR SUPPLIED: 7,000

GENERAL NOTES:
A. SYSTEM OUTDOOR AIR CALCULATION IS BASED ON THE SECTION 403 OF THE 2014 OREGON MECHANICAL SPECIALTY CODE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR ACTUAL OUTDOOR AIR FLOW RATE.
NOTES:
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VENTILATION SCHEDULE - MULTIPLE SPACES - OREGON

LEVEL 1 AND LOWER LEVELS

LOCATION	FLOOR AREA (SF)	PRIMARY AIRFLOW RATE (CFM)	OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE Rp (CFM/PERSON)	AREA OUTDOOR AIRFLOW RATE Ra (CFM/SF)	DEFAULT OCCUPANT DENSITY (PEOPLE/1000SF)	CODE POPULATION	DESIGN POPULATION	OUTDOOR AIRFLOW RATE Vbz (CFM)	ZONE AIR DISTRIBUTION EFFECTIVENESS Ez	OUTDOOR AIR INTAKE Voz (CFM)	DESIGN OUTDOOR AIR INTAKE (CFM)	NOTES
100-01-100 Bar/Lounge	2079	2287	Lobbies/prefunction	8	0.06	30	62.4	62.4	592.5	0.8	741	741	
100-01-105 Hotel Lobby	1272	1399	Main entry lobbies	5	0.06	10	12.7	12.7	139.9	0.8	175	175	
100-01-110 Reception	336	370	Reception areas	5	0.06	30	10.1	10.1	70.6	0.8	89	89	
100-01-115 Lobby Support	156	172	Office spaces	5	0.06	5	0.8	1.0	14.4	0.8	18	18	
100-01-120 Kitchen	2008	2209	Kitchens (cooking)b	--	--	--	0.0	-	0.0	0.8	0	0	
100-01-125 Dining	1012	1113	Dining rooms	8	0.18	70	70.8	70.8	713.5	0.8	892	892	
100-01-130 Event Lobby	554	609	Lobbies/prefunction	8	0.06	30	16.6	16.6	157.9	0.8	198	198	
100-01-135A Event A	810	891	Multipurpose assembly	5	0.06	120	97.2	97.2	534.6	0.8	669	669	
100-01-135B Event B	836	920	Multipurpose assembly	5	0.06	120	100.3	100.3	551.8	0.8	690	690	
100-01-140 Security	83	91	Office spaces	5	0.06	5	0.4	1.0	10.0	0.8	13	13	
100-01-145 HSKP	560	616	Office spaces	5	0.06	5	2.8	2.8	47.6	0.8	60	60	
100-01-150 Break	383	421	Office spaces	5	0.06	5	1.9	1.9	32.6	0.8	41	41	
100-01-155 Prep	388	427	Office spaces	5	0.06	5	1.9	1.9	33.0	0.8	42	42	
Vestibule (Public Elevators)	240	0	Corridors	--	0.06	--	0.0	-	14.4	0.8	18	18	
FCC	200	0	Storage rooms	--	0.12	--	0.0	-	24.0	0.8	30	30	
Storage (lobby)	180	0	Storage rooms	--	0.12	--	0.0	-	21.6	0.8	27	27	
-	-	-	-	-	-	-	-	-	-	-	-	0	
100-01-160 Gen. Mgr	167	184	Office spaces	5	0.06	5	0.8	1.0	15.0	0.8	19	19	
100-01-165 H.R.	206	227	Office spaces	5	0.06	5	1.0	1.0	17.5	0.8	22	22	
100-01-170 open office	815	897	Office spaces	5	0.06	5	4.1	4.1	69.3	0.8	87	87	
100-01-175 Accounting	303	333	Office spaces	5	0.06	5	1.5	1.5	25.8	0.8	33	33	
100-01-180 Linen	526	579	Commercial laundry	25	--	10	5.3	5.3	131.5	0.8	165	165	
100-01-185 Lockerroom	141	155	Locker/dressing roomsg	--	--	--	0.0	-	0.0	0.8	0	0	
100-01-190 lockerroom	142	156	Locker/dressing roomsg	--	--	--	0.0	-	0.0	0.8	0	0	
100-01-195 Uniform	217	239	Storage rooms	--	0.12	--	0.0	-	26.0	0.8	33	33	
100-01-200 Conference	165	182	Conference rooms	5	0.06	50	8.3	8.3	51.2	0.8	64	64	
100-01-205 F&B Storage	789	868	Storage rooms	--	0.12	--	0.0	-	94.7	0.8	119	119	
Telco	170	0	Storage rooms	--	0.12	--	0.0	-	20.4	0.8	26	26	
Electrical	116	0	Storage rooms	--	0.12	--	0.0	-	13.9	0.8	18	18	
				-	-	-	-	-	-	-	-	0	
100-01-210 Engineer	740	814	Office spaces	5	0.06	5	3.7	3.7	62.9	0.8	79	79	
IT	150	165	Office spaces	5	0.06	5	0.8	1.0	14.0	0.8	18	18	
F&B Storage	1000	0	Storage rooms	--	0.12	--	0.0	-	120.0	0.8	150	150	
Storage	1000	0	Storage rooms	--	0.12	--	0.0	-	120.0	0.8	150	150	
TOTALS:	17744	16322					403	405	3740		4686	4686	

TOTAL AIRFLOW: 5000
SYSTEM POPULATION: 303

CODE REQUIRED OUTDOOR AIR INTAKE FLOWRATE - Vot: 4,686
OUTDOOR AIR SUPPLIED: 5,000

GENERAL NOTES:
A. SYSTEM OUTDOOR AIR CALCULATION IS BASED ON THE SECTION 403 OF THE 2014 OREGON MECHANICAL SPECIALTY CODE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR ACTUAL OUTDOOR AIR FLOW RATE.
NOTES:
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Revisions

PORTLAND PROPER HOTEL

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Checked By: Checker

Drawing No.

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GENERAL NOTES:

A. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS, ELEVATIONS, AND FLOOR PLANS FOR ACTUAL LOCATIONS OF ALL CEILING, WALL AND FLOOR MOUNTED DEVICES AND EQUIPMENT.

B. PROVIDE VOLUME DAMPER AT EACH BRANCH OUTLET/INLET.

C. COORDINATE ACCESS PANEL LOCATIONS WITH ARCHITECT

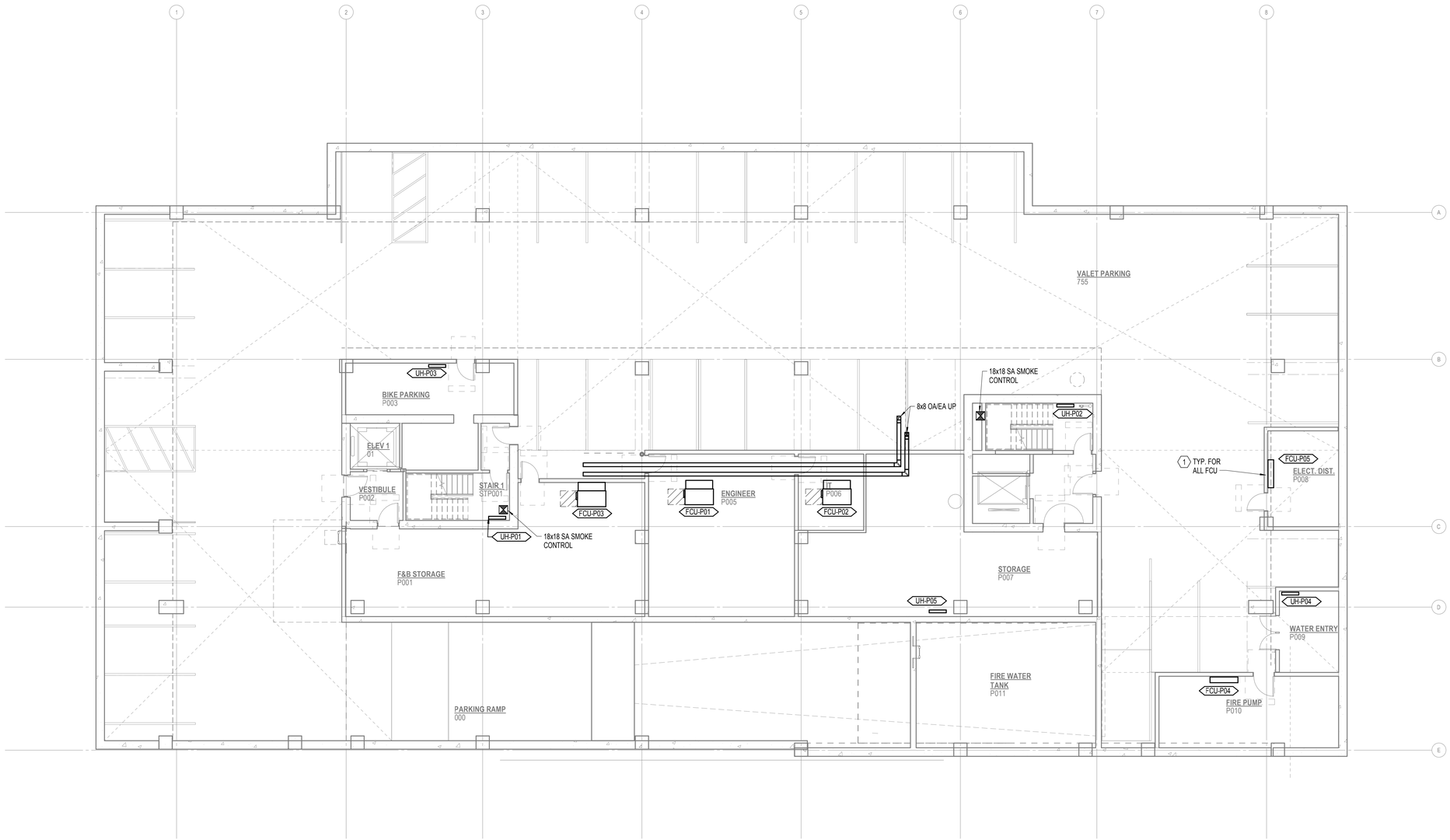
D. RUN DUCTS AND PIPING CONCEALED, UNLESS SPECIFIED OTHERWISE, AND CLEAR OF CEILING INSERTS. ALL DUCTWORK SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO WALL AND UNDERSIDE OF BEAMS AND JOISTS.

E. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

F. ALL PIPING AND CABLES ROUTED THROUGH PLENUMS MUST BE PLENUM RATED.

NOTES:

1. ROUTE CONDENSATE TO NEAREST FLOOR DRAIN OR MOP SINK.



1 MECHANICAL PLAN, FLOOR - PARKING
1/8" = 1'-0"

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LIGHTING DESIGN

LUMA
522 SW FIFTH AVENUE
SUITE 1500
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Revisions

PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - PARKING

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Drawing No.

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A	B
C	D
E	F

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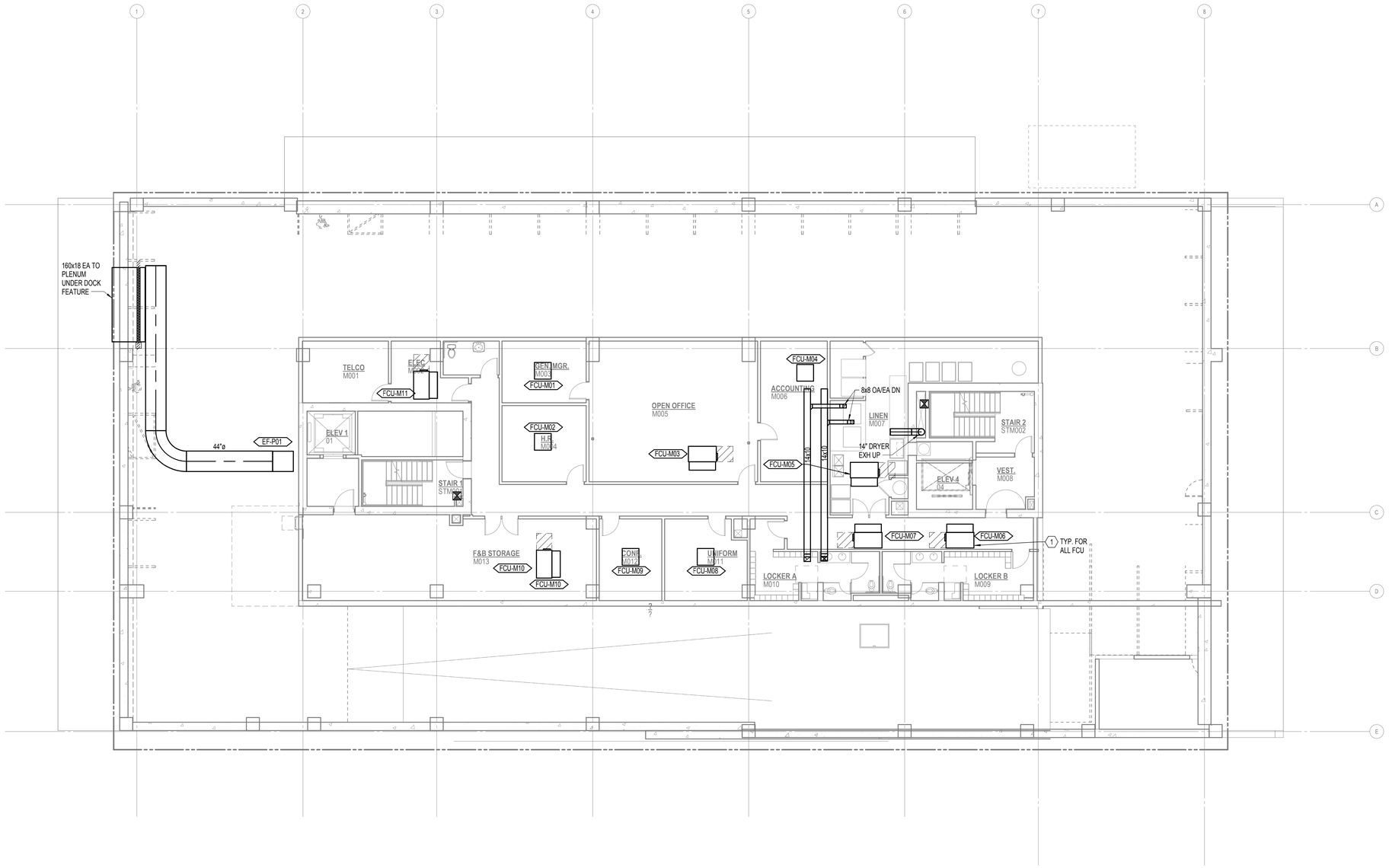
E. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

F. ALL PIPING AND CABLES ROUTED THROUGH PLENUMS MUST BE PLENUM RATED.

NOTES:

1. ROUTE CONDENSATE TO NEAREST FLOOR DRAIN OR MOP SINK.



1 MECHANICAL PLAN, FLOOR - PARKING MEZZANINE
1/8" = 1'-0"

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LUMA
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PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - PARKING MEZZANINE

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.00M

100% DD

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10/16/2019 12:11:36 PM

GENERAL NOTES:

A. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS, ELEVATIONS, AND FLOOR PLANS FOR ACTUAL LOCATIONS OF ALL CEILING, WALL AND FLOOR MOUNTED DEVICES AND EQUIPMENT.

B. PROVIDE VOLUME DAMPER AT EACH BRANCH OUTLET/INLET.

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NOTES:

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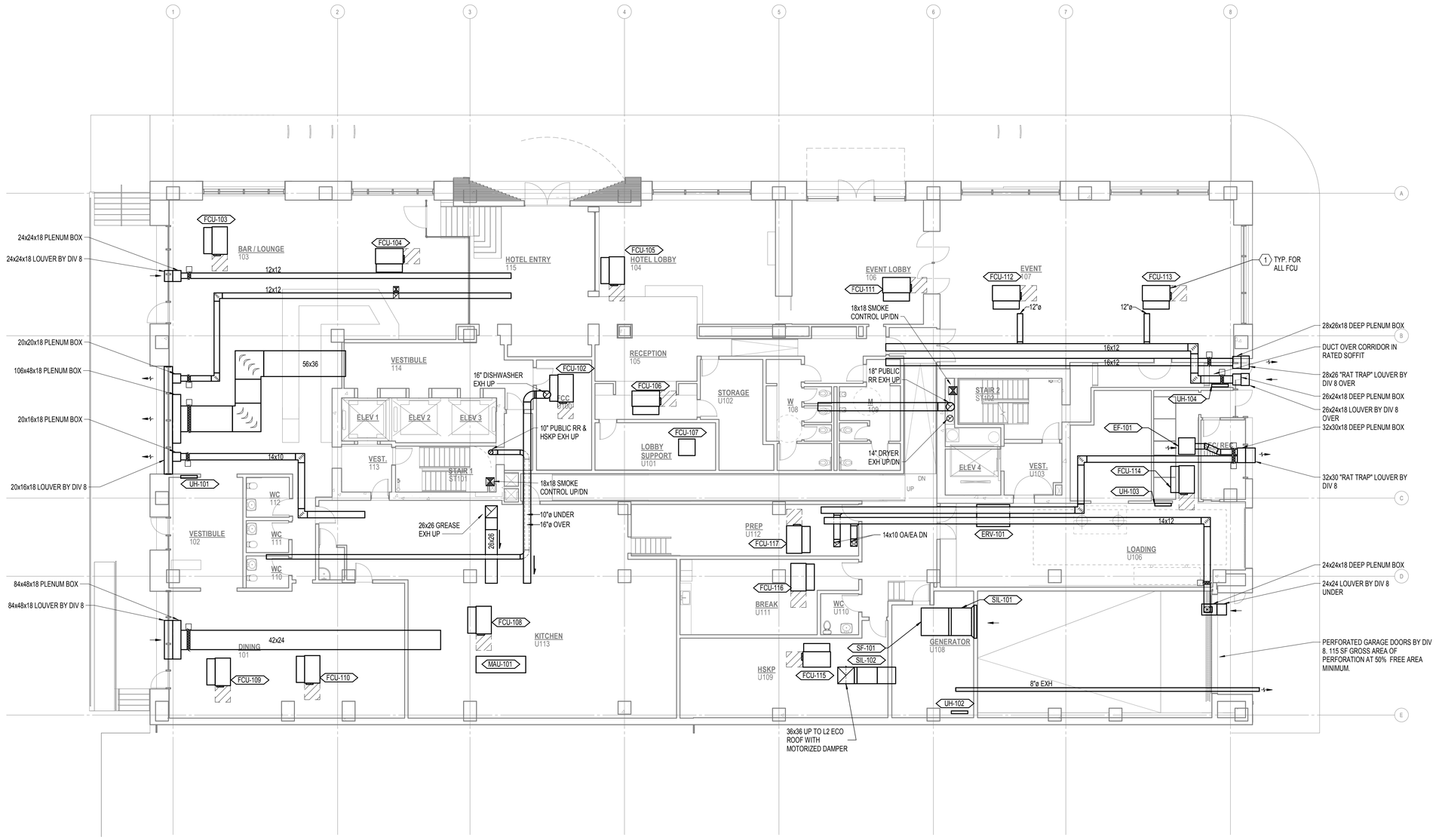

1 MECHANICAL PLAN, FLOOR - LEVEL 1
1/8" = 1'-0"

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PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - LEVEL 1

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.01

100% DD

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GENERAL NOTES:

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NOTES:

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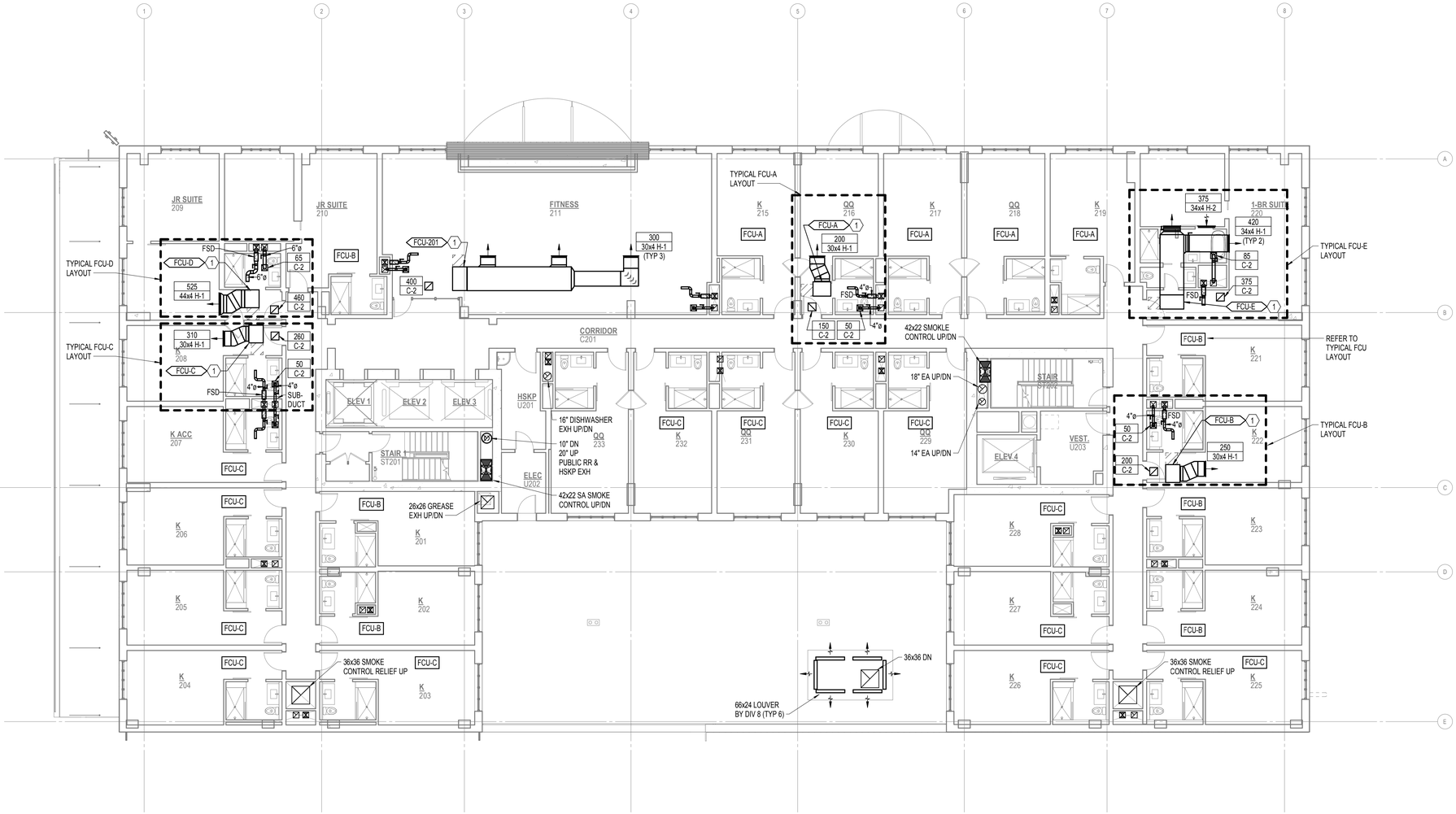

1 MECHANICAL PLAN, FLOOR - LEVEL 2
1/8" = 1'-0"

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PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - LEVEL 2

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.02

100% DD

A B C D E F

10/16/2019 12:11:46 PM

GENERAL NOTES:

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F. ALL PIPING AND CABLES ROUTED THROUGH PLENUMS MUST BE PLENUM RATED.

NOTES:

1. ROUTE CONDENSATE TO NEAREST FLOOR DRAIN OR SINK TAIL PIECE.
2. REFER TO TYPICAL ROOM LAYOUTS ON M2.02.
3. TELCO FAN COIL UNITS ARE ALSO LOCATED ON FLOORS 5 & 7.

1 MECHANICAL PLAN, FLOOR - LEVEL 3
1/8" = 1'-0"

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PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - LEVEL 3-7

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.03

100% DD

A B C D E F

10/16/2019 12:11:52 PM

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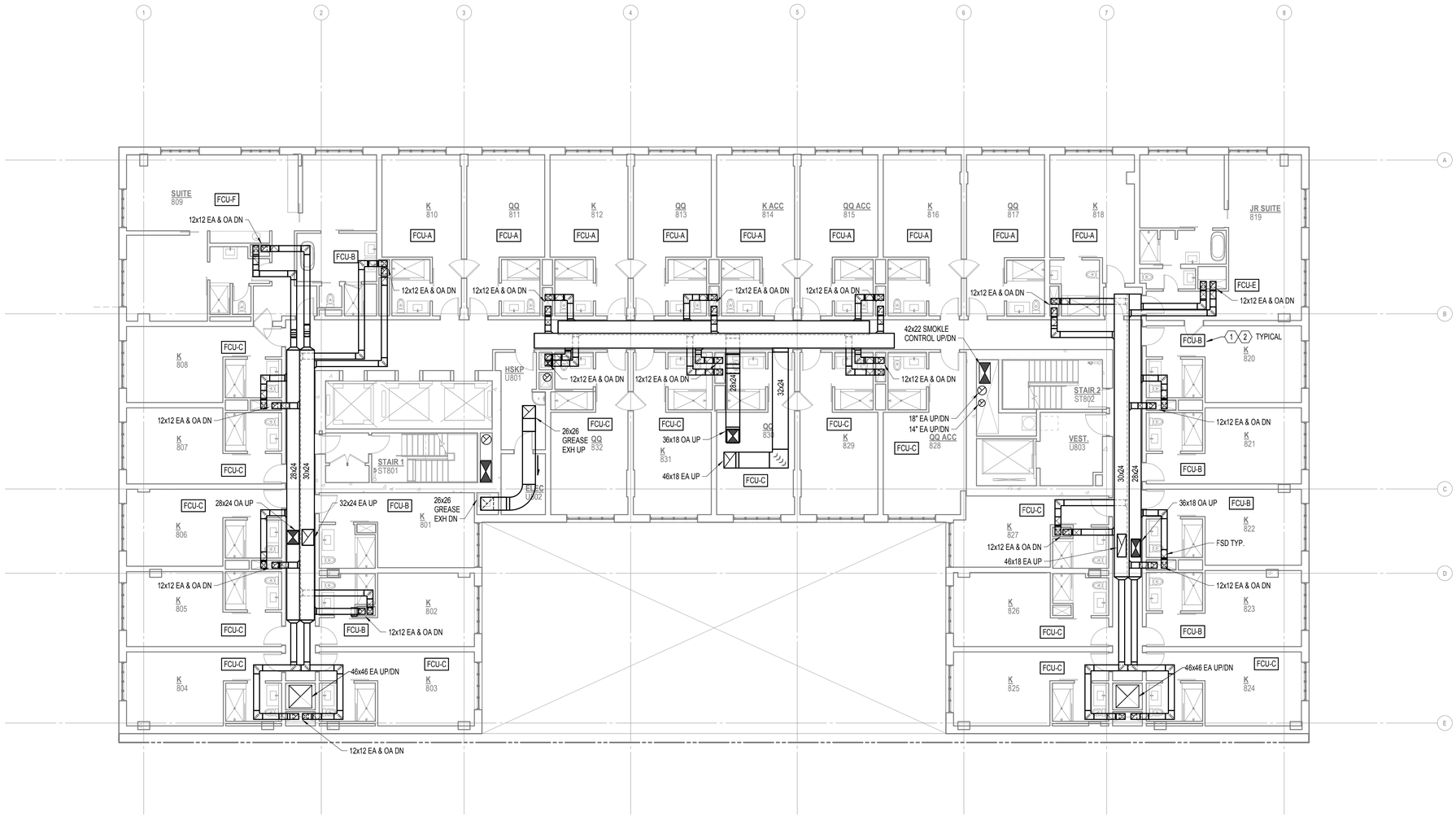

1 MECHANICAL PLAN, FLOOR - LEVEL 8
1/8" = 1'-0"

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PORTLAND PROPER HOTEL

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Drawing Title

MECHANICAL PLAN, FLOOR - LEVEL 8

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.08

100% DD

A B C D E F

10/16/2019 12:11:56 PM

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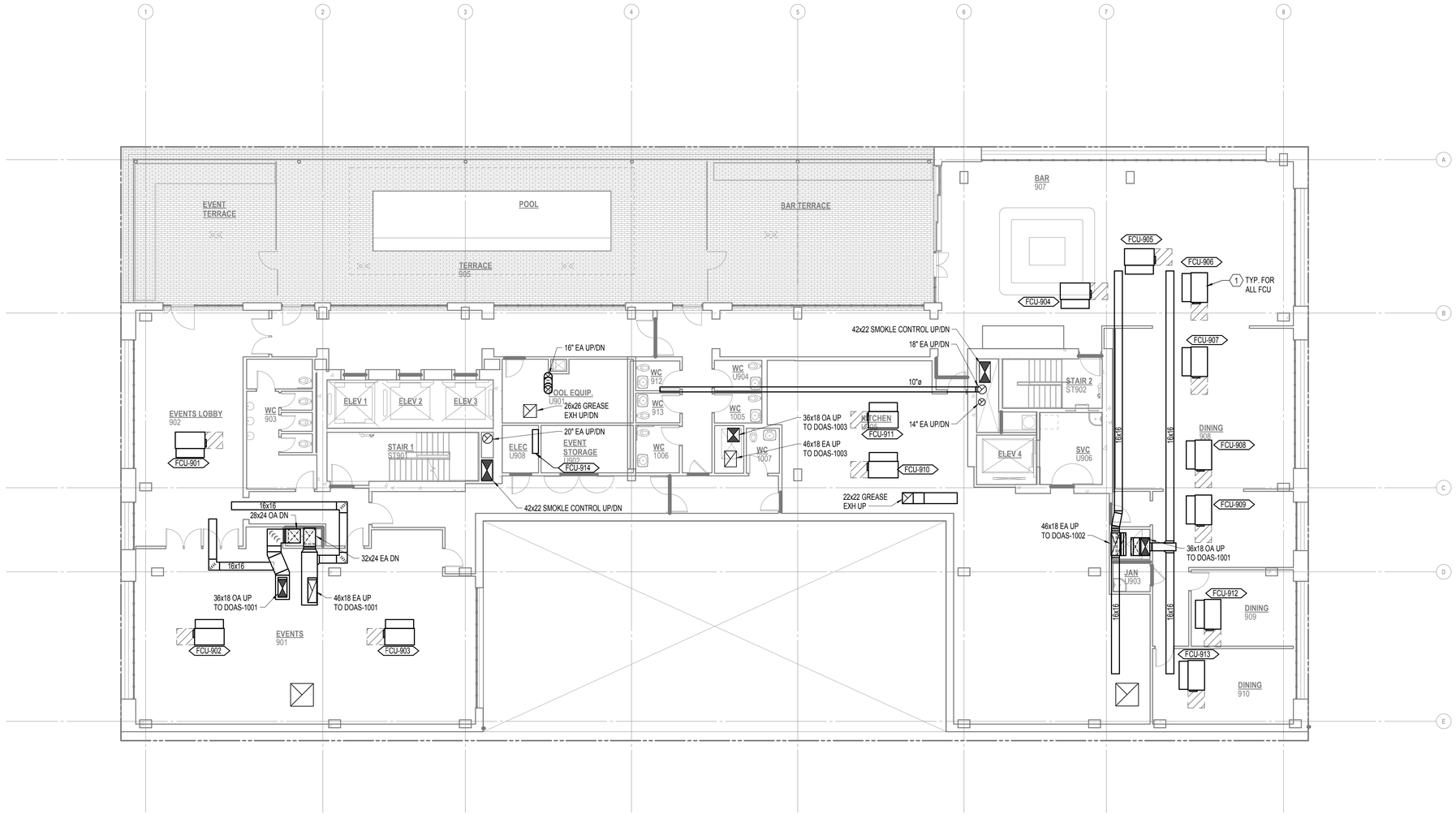

1 MECHANICAL PLAN, FLOOR - LEVEL 9
1/8" = 1'-0"

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PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - LEVEL 9

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.09

100% DD

A	B
C	D
E	F

10/16/2019 12:12:02 PM

GENERAL NOTES:

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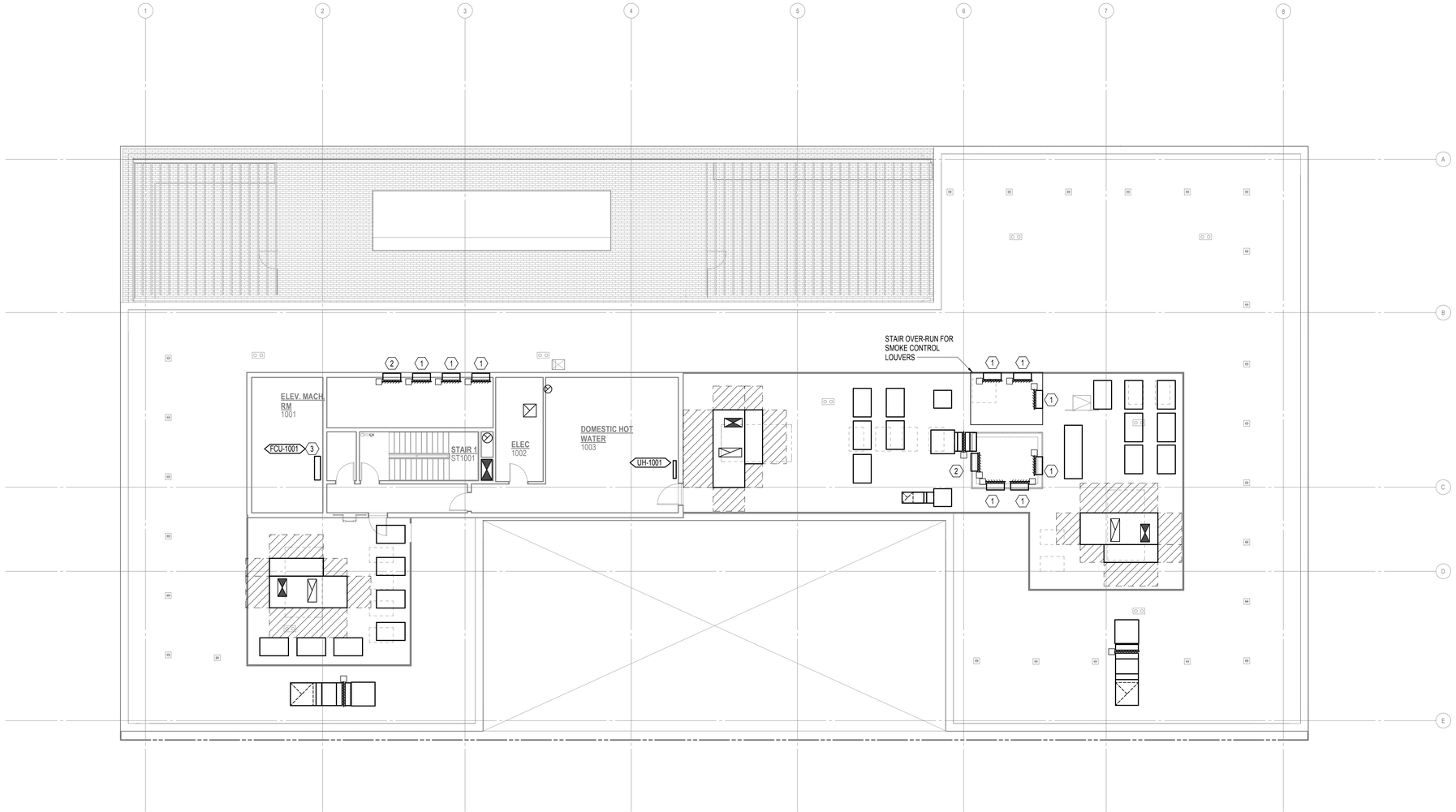
NOTES:

1. 36x36 LOUVER BY DIV 8. SMOKE CONTROL RELIEF.

2. ##x## LOUVER BY DIV 8. FAN FAILURE RELIEF.

3. ROUTE CONDENSATE TO NEAREST FLOOR DRAIN OR SINK TAIL PIECE.



1 MECHANICAL PLAN, FLOOR - MECHANICAL LEVEL
1/8" = 1'-0"

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Revisions

PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - LEVEL 10 MECHANICAL

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.10

100% DD

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GENERAL NOTES:

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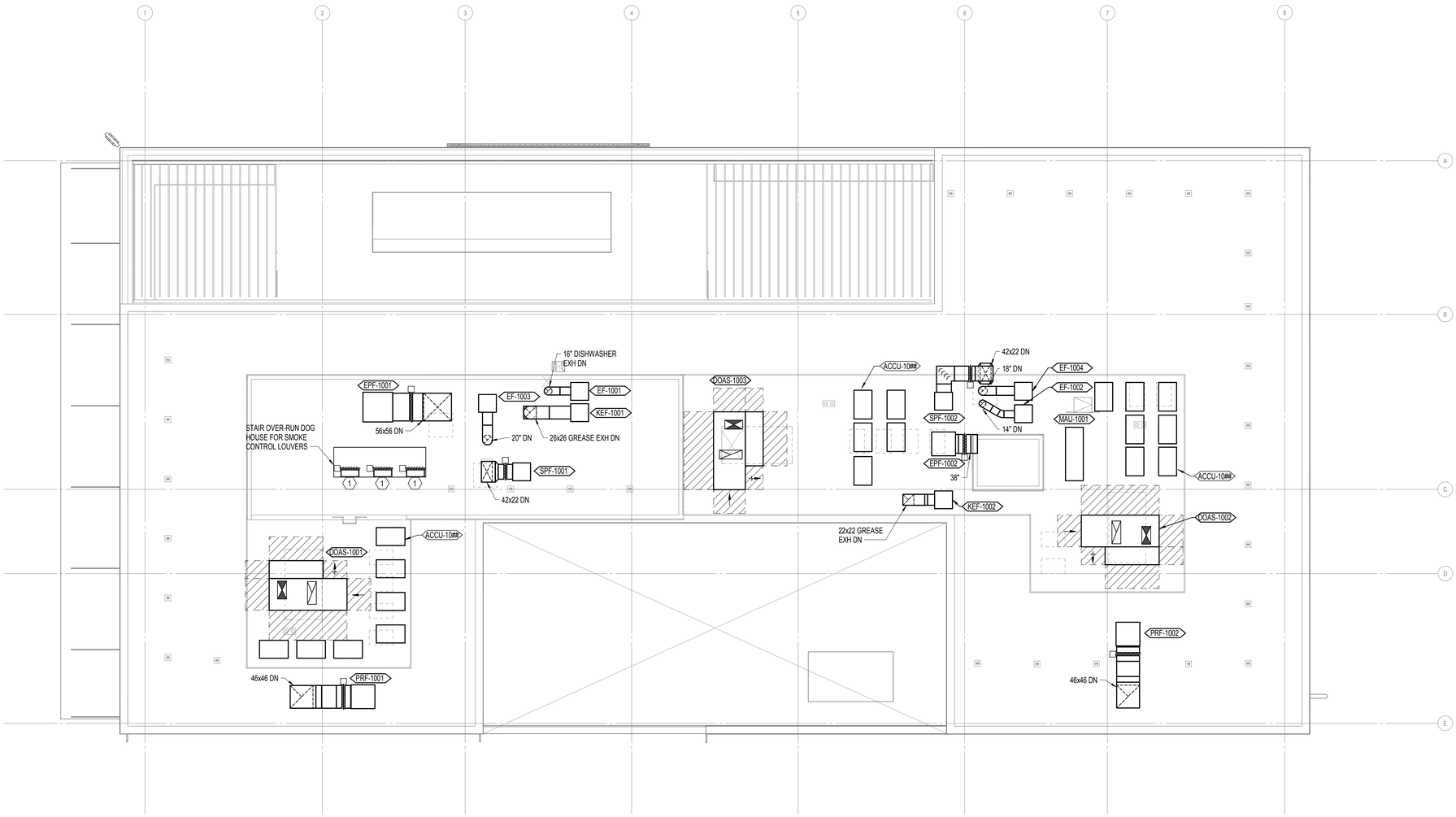

1 MECHANICAL ROOF PLAN
1/8" = 1'-0"

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PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL PLAN, FLOOR - ROOF

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M2.11

100% DD

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C	D
E	F

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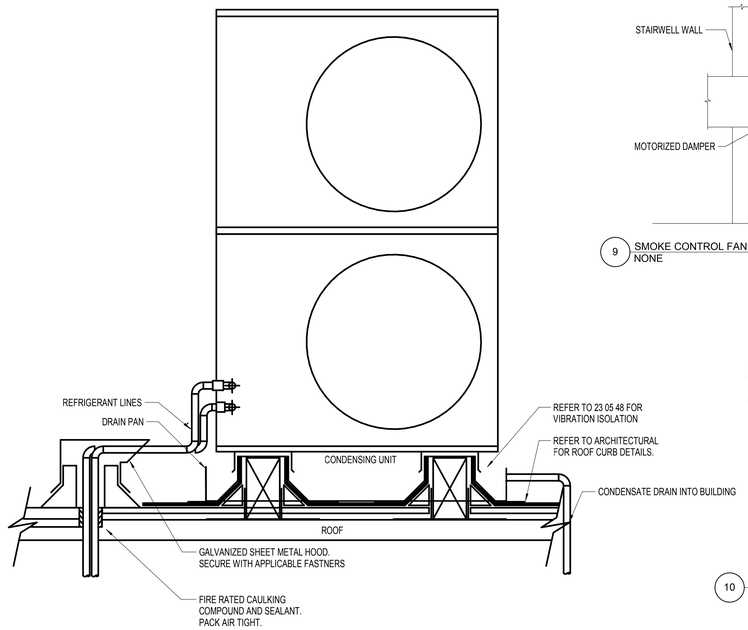
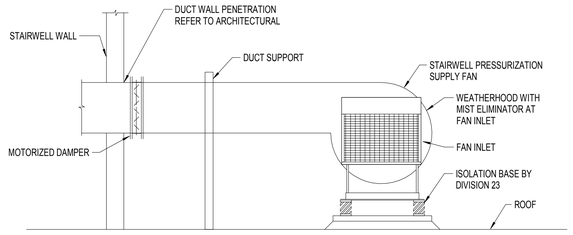
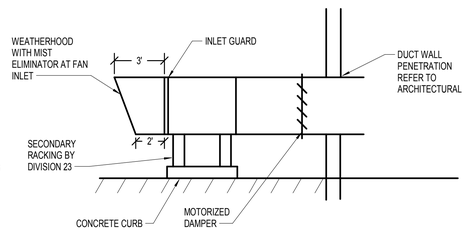


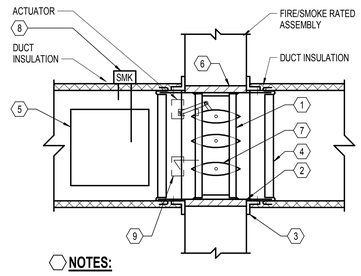
13 CONDENSING UNIT MOUNTING AND REFERIGERANT PIPING ROOF PENETRATION
NONE



9 SMOKE CONTROL FAN - STAIRWELL
NONE



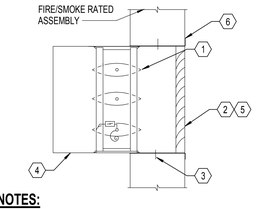
10 SMOKE CONTROL FAN - ELEVATOR SHAFT
NONE



NOTES:

1. COMBINATION FIRE AND SMOKE DAMPER (VERTICAL SUPPLY TYPE SHOWN, HORIZONTAL & RETURN/EXHAUST SIMILAR).
2. GALVANIZED STEEL SLEEVE GAUGE NOT LESS THAN CONNECTION DUCT. FASTEN TO DAMPER FRAME AND PERIMETER ANGLES. CAULK BETWEEN DAMPER FRAME & SLEEVE.
3. PERIMETER ANGLES-14 GA. GALVANIZED STEEL, 1 1/2" x 1 1/2" MIN. TO PROVIDE 1" MIN. OVERLAP OF OPENING ON ALL 4 SIDES. DO NOT FASTEN TO PARTITION.
4. AIR TIGHT, BREAKAWAY DUCT CONNECTION.
5. ACCESS PANEL-SIZE & LOCATION TO PERMIT SERVICING FUSIBLE ROD AND LINK. ACTUATOR TO BE LOCATED OUT OF AIR STREAM. LOCATE PANEL WITHIN 12" OF FSD.
6. PROVIDE 15/16" TO 1/2" CLEARANCE ON HEIGHT & WIDTH, OR AS SPECIFIED BY DAMPER MANUFACTURER. FILL OPENING WITH FIRESTOP MATERIAL.
7. PROVIDE AIRFOIL BLADES ON MEDIUM PRESSURE DUCTWORK.
8. SMOKE DETECTOR FURNISHED PER DIVISION 26, INSTALLED PER DIVISION 23, POWER WIRING PER DIVISION 26, CONTROL WIRING PER DIVISION 28.
9. DAMPER POSITION SWITCH.

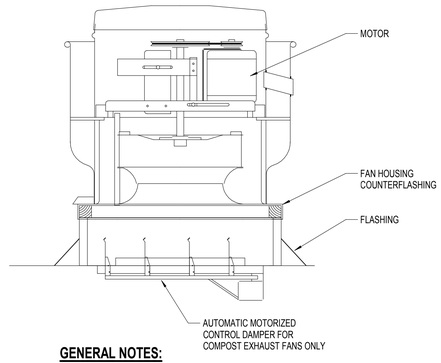
5 COMBINATION FIRE/SMOKE DAMPER
NONE



NOTES:

1. COMBINATION FIRE AND SMOKE DAMPER, BASED ON RUSKING FSD60FA. INSTALL PER MANUFACTURERS INSTRUCTIONS.
2. GRILLE.
3. FASTNERS SHALL BE A MINIMUM #10 SCREWS FOR STUD WALL CONSTRUCTION OR MINIMUM #10 SELF-TAPPING CONCRETE ANCHORS. FASTENERS SHALL BE MINIMUM 12" ON CENTER.
4. FIRE/SMOKE DAMPER SLEEVE (12-1/2").
5. ACTUATOR AND CONNECTION CABINET SHALL BE ACCESSED THROUGH GRILLE.
6. INTEGERAL MOUNTING ANGLE.

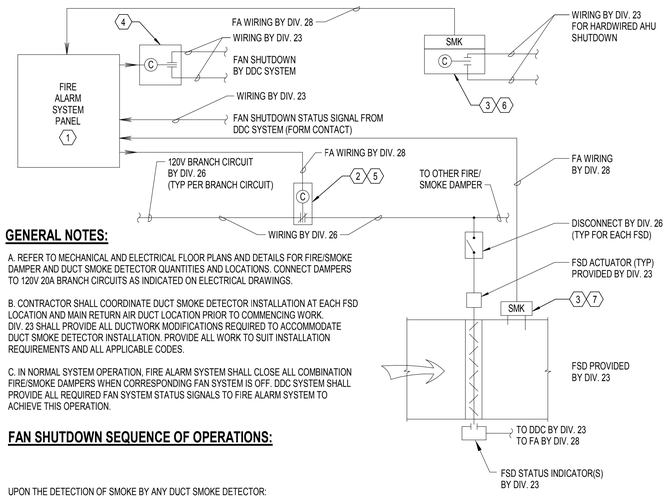
1 COMBINATION FIRE/SMOKE DAMPER FRONT ACCESS
NONE



GENERAL NOTES:

A. SEE SPECIFICATION FOR VIBRATION ISOLATION AND SEISMIC RESTRAINT.

2 UPBLAST EXHAUST FAN
NONE



GENERAL NOTES:

A. REFER TO MECHANICAL AND ELECTRICAL FLOOR PLANS AND DETAILS FOR FIRE/SMOKE DAMPER AND DUCT SMOKE DETECTOR QUANTITIES AND LOCATIONS. CONNECT DAMPERS TO 120V 20A BRANCH CIRCUITS AS INDICATED ON ELECTRICAL DRAWINGS.

B. CONTRACTOR SHALL COORDINATE DUCT SMOKE DETECTOR INSTALLATION AT EACH FSD LOCATION AND MAIN RETURN AIR DUCT LOCATION PRIOR TO COMMENCING WORK. DIV. 23 SHALL PROVIDE ALL DUCTWORK MODIFICATIONS REQUIRED TO ACCOMMODATE DUCT SMOKE DETECTOR INSTALLATION. PROVIDE ALL WORK TO SUIT INSTALLATION REQUIREMENTS AND ALL APPLICABLE CODES.

C. IN NORMAL SYSTEM OPERATION, FIRE ALARM SYSTEM SHALL CLOSE ALL COMBINATION FIRE/SMOKE DAMPERS WHEN CORRESPONDING FAN SYSTEM IS OFF. DDC SYSTEM SHALL PROVIDE ALL REQUIRED FAN SYSTEM STATUS SIGNALS TO FIRE ALARM SYSTEM TO ACHIEVE THIS OPERATION.

FAN SHUTDOWN SEQUENCE OF OPERATIONS:

UPON THE DETECTION OF SMOKE BY ANY DUCT SMOKE DETECTOR:

1. THE FIRE ALARM SYSTEM SHALL SIGNAL THE AIR HANDLING UNIT IN ALARM TO SHUTDOWN VIA ADDRESSABLE CONTROL RELAY LOCATED AT EACH AIR HANDLING UNIT.
2. THE FIRE ALARM SYSTEM SHALL PROVIDE A SIGNAL TO THE DDC SYSTEM VIA SINGLE ADDRESSABLE CONTROL RELAY TO INITIATE THE DDC SYSTEM SHUTDOWN MODE.
3. UPON CONFIRMATION THAT ALL AIR HANDLING UNITS HAVE SHUTDOWN, THE DDC SYSTEM SHALL PROVIDE FAN SHUTDOWN STATUS SIGNAL TO FIRE ALARM SYSTEM.
4. THE FIRE ALARM SYSTEM SHALL CLOSE ALL COMBINATION FIRE/SMOKE DAMPERS VIA ADDRESSABLE CONTROL RELAY(S) 20-SECONDS (ADJUSTABLE) AFTER FAN SHUTDOWN SIGNAL OCCURRED.

UPON FIRE ALARM RESET AFTER THE DETECTION OF SMOKE HAS OCCURRED:

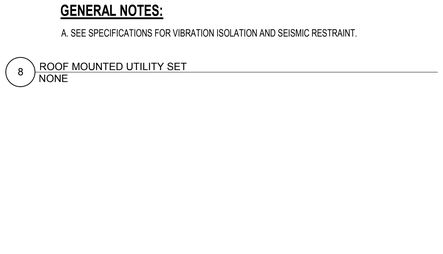
1. THE FIRE ALARM SYSTEM SHALL OPEN ALL COMBINATION FIRE/SMOKE DAMPERS VIA ADDRESSABLE CONTROL RELAY(S).
2. THE FIRE ALARM SYSTEM SHALL DISABLE FAN SHUTDOWN SIGNAL TO THE DDC SYSTEM VIA SINGLE ADDRESSABLE CONTROL RELAY.
3. THE FIRE ALARM SYSTEM SHALL DISABLE SHUTDOWN SIGNAL TO EACH AIR HANDLING UNIT VIA ADDRESSABLE CONTROL RELAY.

NOTES:

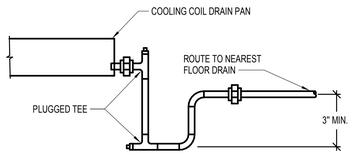
1. REFER TO ELECTRICAL PLANS FOR FIRE ALARM PANEL LOCATION.
2. MOUNT ADJACENT TO APPROPRIATE ELECTRICAL PANEL.
3. PROVIDE/MAINTAIN WORKING ACCESS TO ALL DUCT SMOKE DETECTORS.
4. REMOTE ADDRESSABLE FIRE ALARM RELAY PROVIDED BY DIV. 28 (FORM C CONTACT). MOUNT ADJACENT TO FIRE ALARM PANEL.
5. REMOTE ADDRESSABLE FIRE ALARM RELAY BY DIV. 28 (PROGRAMMED FOR 20 SECOND DELAY AFTER FAN STOP SIGNAL).
6. AHU RETURN AIR DUCT SMOKE DETECTOR WITH SEPARATELY ADDRESSABLE RELAY BASE (FORM C CONTACT) FURNISHED BY DIV. 28. WIRED BY DIV. 28 TO FIRE ALARM SYSTEM. DETECTOR INSTALLED BY DIV. 23.
7. DUCT SMOKE DETECTOR FURNISHED BY DIV. 28. WIRED BY DIV. 28 TO FIRE ALARM SYSTEM. INSTALLED BY DIV. 23.

14 M_HVAC AND FIRE ALARM SYSTEM INTERFACE
NONE

11 DUCTED RETURN/EXHAUST GRILLE
NONE



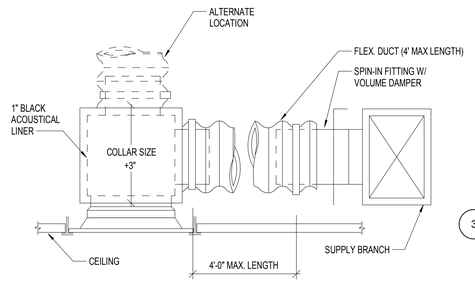
6 RETURN AIR BOOT
NONE



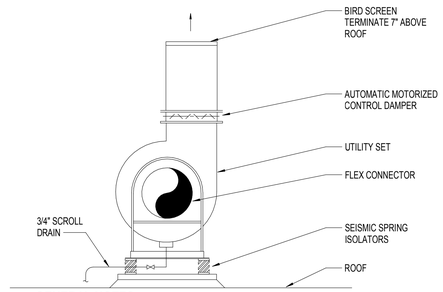
NOTES:

1. DRAIN SIZE IS OUTLET SIZE UNLESS SHOWN LARGER.

12 COIL DRAIN PIPING
NONE



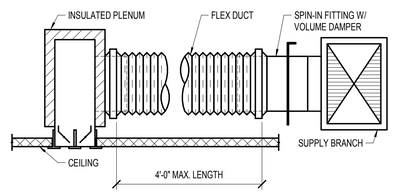
7 TYP. SQUARE NECK T-BAR DIFFUSER
NONE



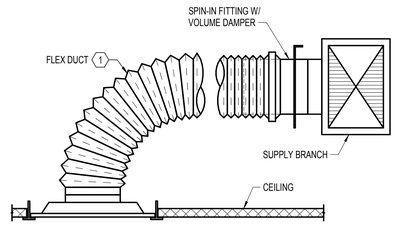
GENERAL NOTES:

A. SEE SPECIFICATIONS FOR VIBRATION ISOLATION AND SEISMIC RESTRAINT.

8 ROOF MOUNTED UTILITY SET
NONE



3 TYPICAL SLOT DIFFUSER
NONE



NOTES:

1. 1.5 DIA. MINIMUM FLEX DUCT RADIUS (4' MAX LENGTH).

4 DIFFUSER DETAIL - ROUND CONNECTION
NONE

ZGF
ZIMMER GUNSUL FRASCA ARCHITECTS LLC

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Consultants

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PORTLAND, OR 97209
1455 NW IRVING STREET, STE 400
503-220-0895

STRUCTURAL
KPFF CONSULTING ENGINEERS
111 SW FIFTH AVENUE
SUITE 2500
T 503-227-3251

CIVIL
KPFF CONSULTING ENGINEERS
111 SW FIFTH AVENUE
SUITE 2500
T 503-227-3251

MEP (BOD)
PAE CONSULTING ENGINEERS
522 SW FIFTH AVENUE
SUITE 1500
T 503-226-2921

LIGHTING DESIGN
LUMA
522 SW FIFTH AVENUE
SUITE 1500
T 503-226-2921

Revisions

PORTLAND PROPER HOTEL

1202 NW IRVING ST

Drawing Title

MECHANICAL DETAILS

Date:	10.18.19
Job No:	23725.irvi
Drawn By:	Author
Checked By:	Checker

Drawing No.

M4.00

100% DD

10/16/2019 12:12:20 PM

Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-609
AAONEcat32 Ver. 4.288 (SN: 7522416

1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22
R	N	-	0	1	6	-	3	-	0	-	E	6	0	E	-	1	2	A	:	1	N	L	G	-	D	L	B	-	N

RN-016-3-0-E60E-12A:1NLG-DLB-NQG-AFA-00QABBZ-00-D000000V

Tag: 6K CFM HRV

Job Information

Job Name:	*Proper Hotel*
Job Number:	*Job #9990237*
Site Altitude:	*0 ft*
Refrigerant	*R-410A*

Unit Information

Approx. Op./Ship Weights:	*3461 / 3461 lbs. (±5%)*
Supply CFM/ESP:	*6000 / 1.5 in. wg.*
Pre-Filter FV / Qty:	*288.00 fpm / 6*
Final Filter FV / Qty:	*288.00 fpm / 6*
Exhaust CFM/ESP/TSP:	*6000 / 1.50 / 2.67 in. wg.*
Outside CFM:	*6000*
Ambient Temperature:	*92 ºF DB / 68 ºF WB*
Return Temperature:	*75 ºF DB / 62 ºF WB*

Static Pressure

External:	*1.50 in. wg.*
Evaporator:	*0.18 in. wg.*
Filters Clean:	*0.27 in. wg.*
Dirt Allowance	*0.35 in. wg.*

Economizer:	*0.14 in. wg.*
Heating:	*0.09 in. wg.*
Cabinet:	*0.08 in. wg.*
Energy Recovery:	*0.81 in. wg.*
Total:	*3.41 in. wg.*

Cooling Section

	Gross	Net
Equivalent Total Capacity:	*253.63 MBH*	*240.15 MBH*
Total Capacity:	*183.39*	*169.91 MBH*
Sensible Capacity:	*166.71*	*153.23 MBH*
Latent Capacity:	*16.68 MBH*	
HW Total Cooling Capacity:	*70.24 MBH*	
Mixed Air Temp:	*82.07 ºF DB*	*64.92 ºF WB*
Entering Air Temp:	*82.07 ºF DB*	*64.92 ºF WB*
Lv Air Temp (Coil):	*55.74 ºF DB*	*54.26 ºF WB*
Lv Air Temp (Unit)	*57.81 ºF DB*	*55.09 ºF WB*
Digital Comp. Capacity Ratio:	*100%*	
Supply Air Fan:	*1 x 270D60 @ 4.82 BHP*	
SA Fan RPM / Width:	*1385 / 3.680"*	
Exhaust Air Fan:	*1 x RM220AB70 @ 5.30 BHP*	
EA Fan RPM / Width:	*2099 / 3.450"*	
Evaporator Coil:	*19.9 ft² / 3 Rows / 14 FPI*	
Evaporator Face Velocity:	*302.1 fpm*	
Energy Recovery:	*1 x SF-54*	

Heating Section(**)

Primary Heat Type:	*Heat Pump*
Total Equivalent Capacity:	*323.2 MBH*
Total Capacity:	*144.2 MBH*
Integrated Heat Capacity:	*129.6 MBH*
OA Temp:	*22.0 ºF DB / 21.0 ºF WB*
RA Temp:	*70.0 ºF DB / 58.0 ºF WB*
Entering Air Temp:	*50.0 ºF DB / 42.9 ºF WB*
Leaving Air Temp:	*69.2 ºF DB / 51.8 ºF WB*
Auxiliary Heat Type:	*Electric Heat*
Heating CFM:	*6000*
Total Capacity:	*68.3 MBH*
OA Temp:	*22.0 ºF DB / 21.0 ºF WB*
RA Temp:	*70.0 ºF DB / 58.0 ºF WB*
Entering Air Temp:	*69.2 ºF DB / 51.8 ºF WB*
Leaving Air Temp:	*79.8 ºF DB / 56.2 ºF WB*
Input (Emer/Aux) :	*20.0 kW / 20.0 kW*
Heater Qty (Emer/Aux):	*2 / 2*
Electric Heat FLA:	*24.1*
Fan Temp Rise:	*2.1 ºF*

Rating Information

Application EER @ Op. Conditions: *10.2*

Application COP_H @ Op. Conditions: *5.05*

Electrical Data

Rating:	*460/3/60*
Unit FLA:	*75*
Minimum Circuit Amp:	*84*
Maximum Overcurrent:	*90*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			12.6
Compressor 2:	1		460	3			12.2
Condenser Fans:	2	0.75	460	3	1080	1.8	
Supply Fan:	1	7.50	460	3	1760	11.0	
Exhaust Fan:	1	7.50	460	3	1760	11.0	
Energy Recovery:	1	0.25	460	3	1575	0.47	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	94	94	97	95	89	88	87	83
Return LW(dB):	97	95	94	89	86	84	82	77

*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.

Unit Rating

(**)Fan motor temperature rise is not included in the heat capacity and temps.

Unit Rating

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AAONEcat32 Ver. 4.288 (SN: 7522416-)

1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
R	N	-	0	1	6	-	3	-	0	-	E	6	0	E	-	1	2	A	:	1	N	L	G	-	D	L	B	-	N	Q

G	-	A	F	A	-	0	0	Q	A	B	B	Z	-	0	0	-	D	0	0	0	0	0	0	V	B

Tag: 6K CFM HRV

Job Information

Job Name:	Proper Hotel	Job Number:	Job #9990237
OA CFM:	6000	SA CFM:	6000

Performance Data Table

Outside Air		Mixed Air		Leaving Air		Heat Pump Capacity	Heat Pump Integrated Capacity
DB ºF	WB ºF	DB ºF	WB ºF	DB ºF	WB ºF	MBH	MBH
62.0	56.2	67.0	57.4	101.9	69.3	227.5	227.5
57.0	51.6	65.1	55.8	98.1	67.4	215.4	215.4
52.0	47.1	63.3	54.4	94.2	65.6	203.3	203.3
47.0	42.6	61.4	53.0	90.5	63.9	191.8	191.8
42.0	38.0	59.5	51.6	87.0	62.3	182.0	182.0
37.0	33.5	57.6	50.4	79.8	59.3	171.7	147.5
32.0	28.8	55.7	49.1	76.8	57.8	161.1	140.8
27.0	24.3	53.8	47.9	73.8	56.3	150.8	133.7
22.0	19.7	51.9	46.7	71.0	55.0	142.5	128.1
17.0	15.0	50.0	45.5	68.1	53.6	134.3	122.2
12.0	10.4	48.0	44.4	*	*	*	*
7.0	5.7	46.1	43.2	*	*	*	*
2.0	0.1	44.2	41.9	*	*	*	*

*Invalid operating point - Compressor operating outside of operating envelope.

Energy Recovery Rating

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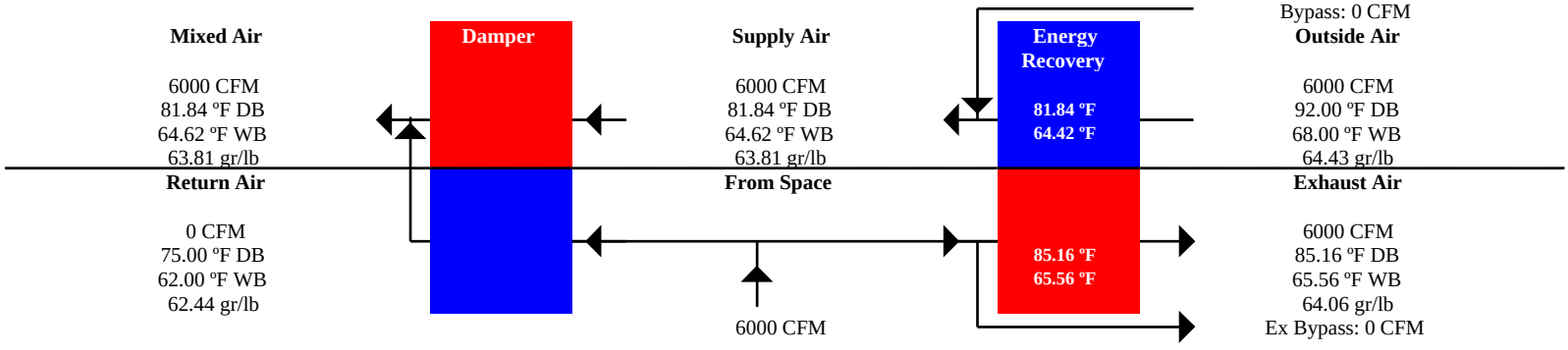
1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
R	N	-	0	1	6	-	3	-	0	-	E	6	0	E	-	1	2	A	:	1	N	L	G	-	D	L	B	-	N	Q
G	-	A	F	A	-	0	0	Q	A	B	B	Z	-	0	0	-	D	0	0	0	0	0	V	B						

Tag: 6K CFM HRV

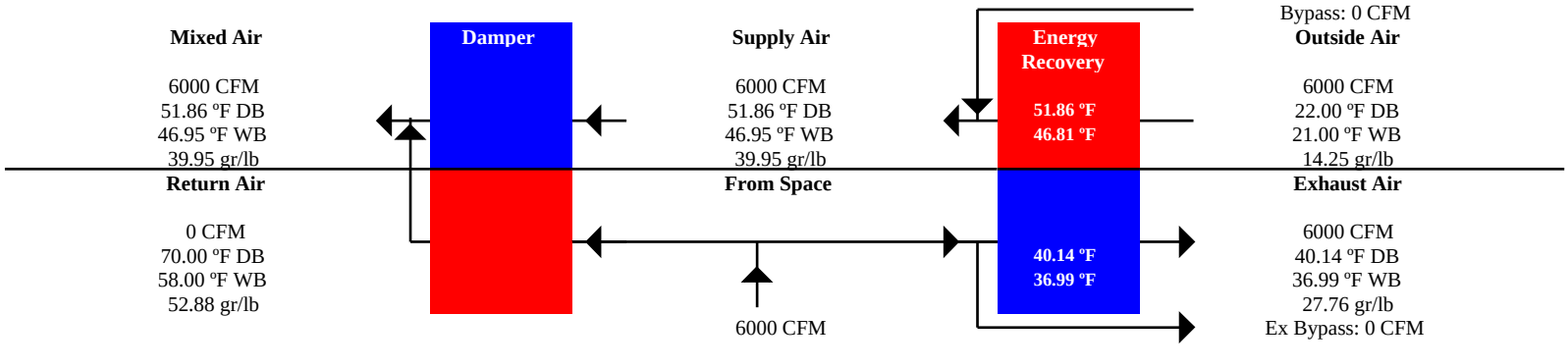
Job Name	**Proper Hotel**	Energy Recovery Type:	**Total**
Job Number	**Job #9990237**	Energy Recovery Model:	**SF-54**
Site Altitude	**0'**	Energy Recovery Qty:	**1**

Summer Conditions



	Cooling/Dehumidification	Heating/Humidification	Effectiveness
Total Capacity:	**70.24 MBH**	**0.00 MBH**	**0.808**
Sensible Capacity:	**65.91 MBH**	**0.00 MBH**	**0.598**
Latent Capacity:	**4.33 MBH**	**0.00 MBH**	**0.565**

Winter Conditions



	Cooling/Dehumidification	Heating/Humidification	Effectiveness
Total Capacity:	**0.00 MBH**	**300.15 MBH**	**0.653**
Sensible Capacity:	**0.00 MBH**	**193.58 MBH**	**0.622**
Latent Capacity:	**0.00 MBH**	**106.57 MBH**	**0.657**

Unit Submittal

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AAONEcat32 Ver. 4.288 (SN: 7522416-)

1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
R	N	0	1	6	-	0	E	6	0	E	1	2	A	:	1	N	L	G	-	D	L	B	-	N	Q	G	-	A	F	A	-	0	0	Q	A	B	B	Z	-	0	0	-	D	0	0	0	0	0	V	B

Tag: 6K CFM HRV

Job Name: *Proper Hotel*
Job Number: *Job #9990237*
Unit Submittal For:
Unit Submittal Date: *January 20, 2020*

	Base Option	Description
R	Series	Roof Top Unit
N	Generation	Ninth Generation
016	Unit Size	Sixteen
3	Voltage	460V/3Ø/60Hz
0	Interior Protection	Standard
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC)
6	Unit Configuration	Air-Source Heat Pump
0	Coil Coating	Standard
E	Cooling/Heat Pump Staging	Modulating Heat Pump + 1 Stage Auxiliary Heat - 1 VCC + 1 On/Off Comp.
1	Heating Type	Electric Heat
2	Heating Designation	Heat 2 - 20 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
1	**1A.** RA/OA Section	AAONAIRE® Energy Recovery Wheel + Bypass Damper + 1% Purge - Total + High CFM
N	**1B.** RA/EA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD + Shaft Grounding
L	**1C.** RA/EA Blower	22" Backward Curved Plenum - 70% Width with Banding
G	**1D.** RA/EA Blower Motor	7.5 hp - 1760 rpm
D	**2.** OA Control	Fully Modulating Actuator - Enthalpy Limit
L	**3.** Heat Options	20 kW - Auxiliary Heating Capacity
B	**4.** Maintenance Options	115V Convenience Outlet - Factory Wired
N	**5A.** SA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD + Shaft Grounding
Q	**5B.** SA Blower	27" Direct Drive Backward Curved Plenum - 60% Width
G	**5C.** SA Motor	7.5 hp - 1760 rpm
A	**6A.** Pre Filter Type	2" Pleated Pre Filter - 30% Eff
F	**6B.** Unit Filter Type	4" Pleated - 65% Eff - MERV 11
A	**6C.** Filter Options	Clogged Filter Switch
0	**7.** Refrigeration Control	Standard - Adj Comp. Cool&Heat Lock Out Through Unit Controls
0	**8.** Refrigeration Options	Standard
Q	**9.** Refrigeration Accessories	VFD Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
A	**10.** Power Options	Non-fused Disconnect Power Switch - 100 Amps
B	**11.** Safety Options	RA Smoke Detector
B	**12.** Controls	Phase & Brown Out Protection
Z	**13.** Special Controls	Constant Volume (CV) Heat Pump Unit Controller - CV Cool + CV Heat
0	**14A.** Outside Air Configuration	Standard - None
0	**14B.** Preheat Sizing	Standard - None
D	**15.** Glycol Percent	Water or No WSHP with Aluminum Energy Recovery Wheel
0	**16.** Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
0	**17.** Exterior Cabinet Options	Standard
0	**18.** Customer Code	Standard
0	**19.** Code Options	Standard - ETL U.S.A. Listing
0	**20.** Crating	Standard
0	**21.** Water-Cooled Cond.	Standard - None
V	**22.** Control Vendors	VCC-X Controls + Integrated BACnet MSTP
B	**23.** Type	Standard - Includes AAON Gray Paint

VCCX Components

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1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-016-3-0-E60E-12A:1NLG-DLB-NQG-AFA-00QABBZ-00-D000000VB

Tag: 6K CFM HRV

Job Name: ***Proper Hotel*** **VCCX For:**

Job Number: ***Job #9990237*** **VCCX Date:** ***January 20, 2020***

Hardware Included For VCCX Controller

Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
P94320	Space Temp Sensor	VCCX control point AI 1	AI:12
V13050	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16,AI:17,AI:18,AI:19
P94320	Space Temp Slide Adjust	VCCX control point AI 2	AI:8
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
R37030	Building Pressure Sensor	VCCX control point AI 5	AI:23
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
	Modulated Heating (0-10VDC)	VCCX control point AO 3	AI:35
	Building Pressure Control Signal	VCCX control point AO 4	AI:24
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay point	BI:63
	Exhaust Fan	Configured Relay Point	BI:64
	Energy Recovery Wheel	Configured Relay Point	BI:65
	Heat 1	Configured Relay Point	BI:66
ASM02201	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:56
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD point SP-2	AI:54
V38410	Discharge Pressure Sensor B	RSMD point HP-2	AI:55
	Modulated Condenser Signal AB	RSMD point AO1	BI:
V12960	O.D. Coil Defrost Temp Switch	RSMD point BIN3	BI:80
	Comp Status Input A	RSMD point BIN1	
	Comp Status Input B	RSMD point BIN2	BI:79
	Emergency Shutdown	RSMD point BIN4	BI:81,82
	Comp Unload Signal A	RSMD point T1	
	Comp Enable A	RSMD Fixed Relay point	AI:46
	Comp Enable B	RSMD Fixed Relay point	BI:77,BI:84
	Comp Cir Reversing Valve	RSMD Fixed Relay point	BI:88

27.0" STAR Plenum

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AAONEcat32 Ver. 4.288 (SN: 7522416-)

JOB INFORMATION:

Job Name:	*Proper Hotel*
Job Tag:	*6K CFM HRV*
Rep Firm:	
Date:	*01/20/2020*

WHEEL SPECIFICATION:

Max RPM:	*1,800*
Diameter x Qty:	*27.4 in. x 1*
Width%:	*100*
Tip Speed:	*9,935 FPM*
Inertia:	*16 WR²*

OPERATING CONDITIONS:

Air Flow:	*6,000 CFM*
Static Pressure:	*3.41 in. Wg.*
Plenum DP:	*0.00 in. Wg.*
Inlet Grill DP:	*0.00 in. Wg.*
TSP:	*3.41 in. Wg.*
Site Altitude:	*0.00 Ft*
TSP @ Sea Level:	*3.41 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass:	*7.5 / No*
Frame Size:	*213T*
Nominal RPM:	*1760*
VAC/PH/HZ:	*460/3/60*
Efficiency	*Premium / 0.91*
Enclosure Type:	*ODP*
Max Inertial Load:	*64 WR²*

FAN PERFORMANCE:

RPM:	*1385*
BHP:	*4.82*
Efficiency:	*66.9%*
In/Out Velocity:	*1567/1639 FPM*
Plenum Out Velocity:	*100 FPM*

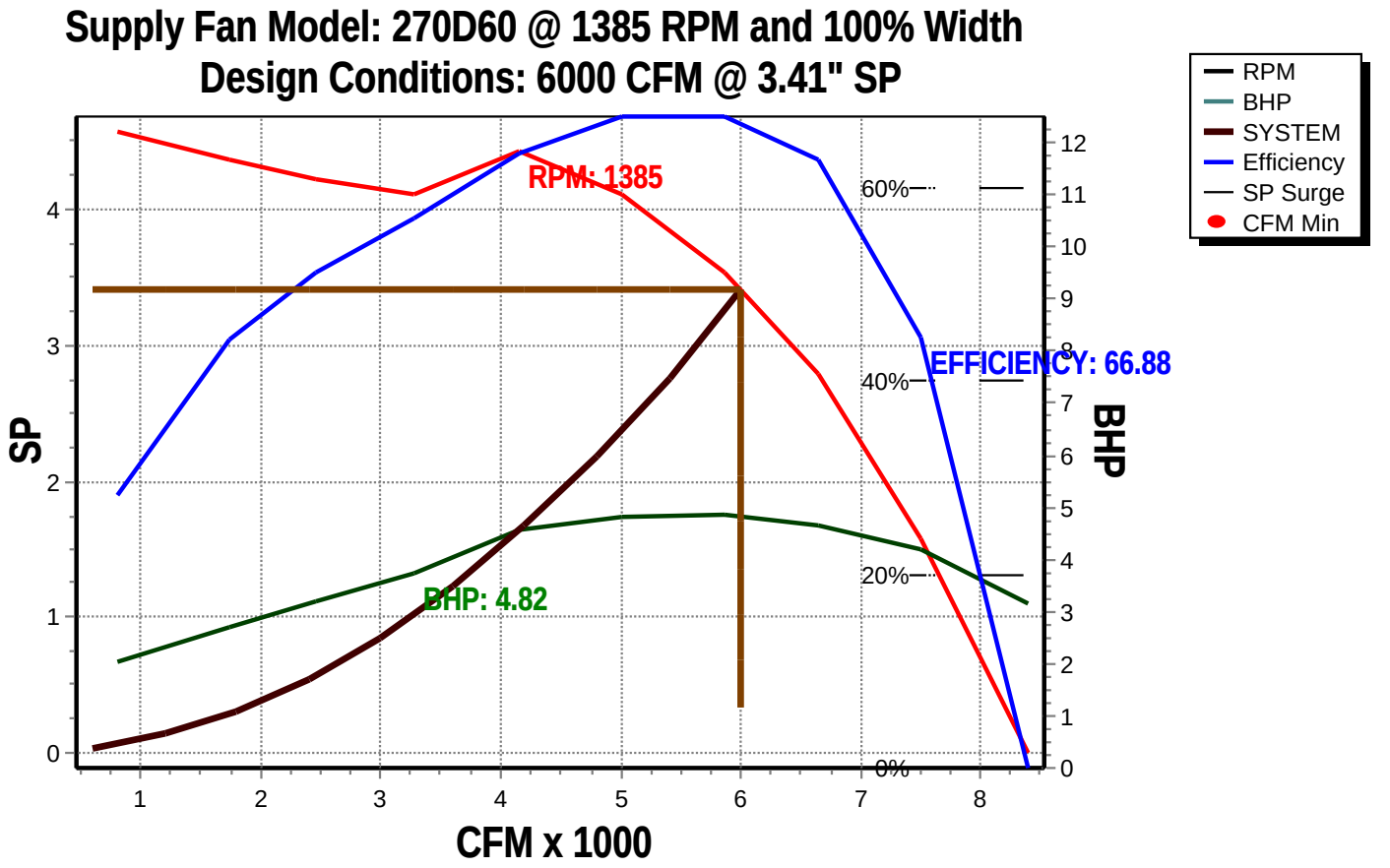
FAN SOUND POWER (Inlet/Outlet):

Octave Band: **(Re 10^-12 watts)**

1	2	3	4	5	6	7	8
90	*87*	*85*	*84*	*84*	*85*	*84*	*83*
92	*91*	*92*	*93*	*91*	*91*	*91*	*87*

SOUND POWER A-Weighted: 93 / 98 dB

Max Duct SP with Blocked Airway: **4.4 in. Wg. @ 1385 rpm**



22.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.288 (SN: 7522416-)

JOB INFORMATION:

Job Name:	*Proper Hotel*
Job Tag:	*6K CFM HRV*
Rep Firm:	
Date:	*01/20/2020*

WHEEL SPECIFICATION:

Max RPM:	*2,200*
Diameter x Qty:	*22.0 in. x 1*
CFM:	*6000*
Tip Speed:	*12,089 FPM*
Inertia:	*5 WR²*

OPERATING CONDITIONS:

Air Flow:	*6,000 CFM*
Static Pressure:	*2.25 in. Wg.*
Relief Dampers DP:	*0.42 in. Wg.*
TSP:	*2.67 in. Wg.*
Site Altitude:	*0.00 Ft*
TSP @ Sea Level:	*2.67 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass:	*7.5 / No*
Frame Size:	*213T*
Nominal RPM:	*1760*
VAC/PH/HZ:	*460/3/60*
Efficiency	*Premium / 0.91*
Enclosure Type:	*ODP*
Max Inertial Load:	*64 WR²*

FAN PERFORMANCE:

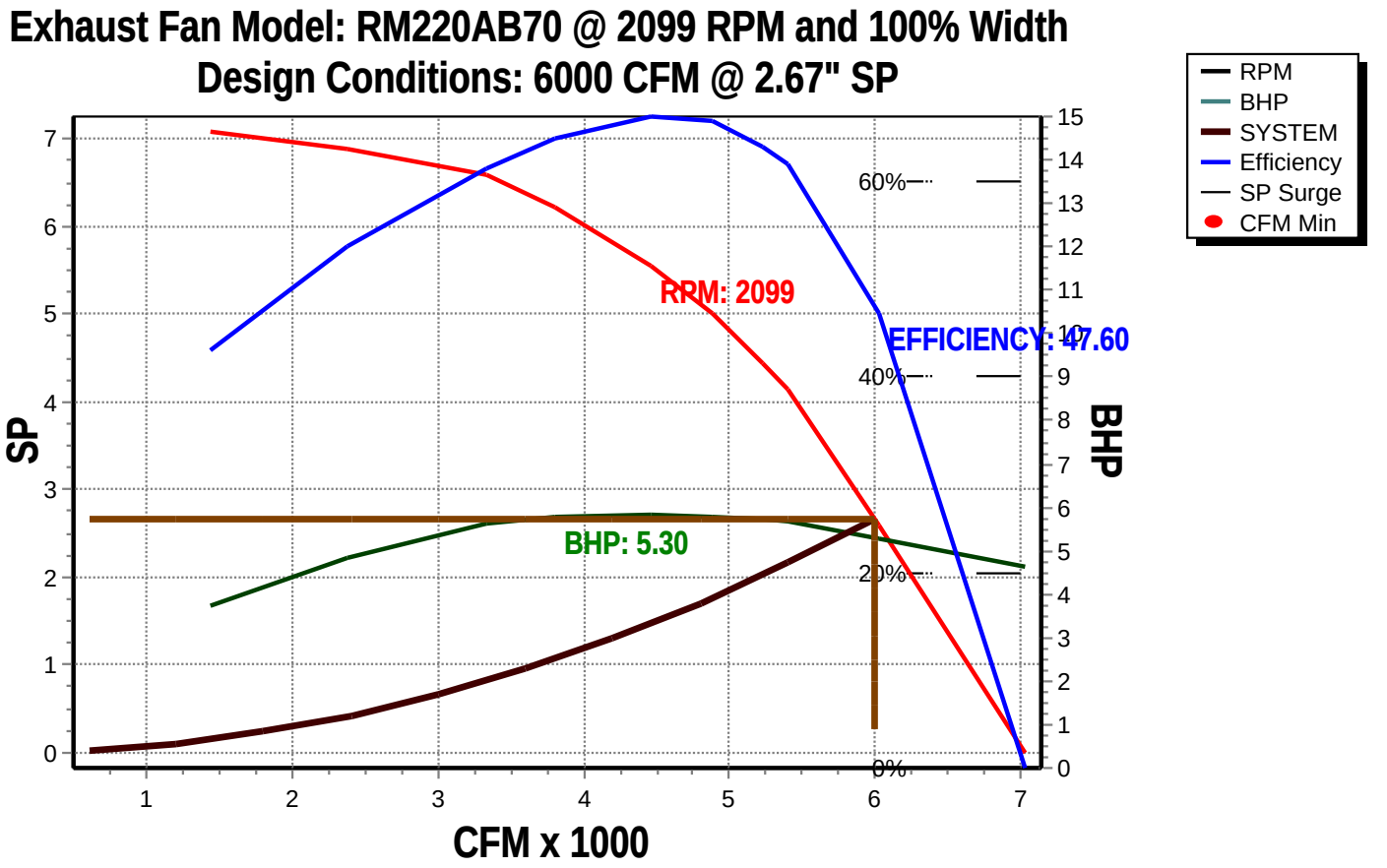
RPM:	*2099*
BHP:	*5.30*
Efficiency:	*47.6%*
In/Out Velocity:	*1835/2020 FPM*
Plenum Out Velocity:	*100 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band: **(Re 10^-12 watts)**

1	2	3	4	5	6	7	8
97	*96*	*99*	*97*	*90*	*87*	*85*	*80*
97	*96*	*99*	*97*	*90*	*87*	*85*	*80*

SOUND POWER A-Weighted: 99 / 99 dB

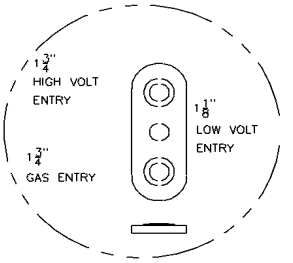


RN SERIES
C - CABINET WITH ECONOMIZER ~ 16-30 TON
ENERGY RECOVERY SECTION AND POWER EXHAUST

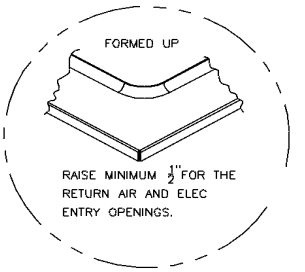
CLEARANCES

LOCATION	◦ UNIT SIZE ◦ 16 - 30 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	60
TOP	UNOBSTRUCTED

TOP VIEW



DETAIL A

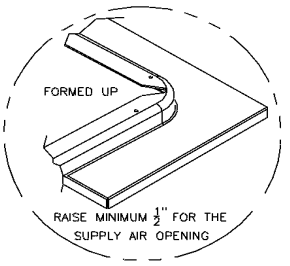


DETAIL B

NUMBER OF CONDENSER FANS

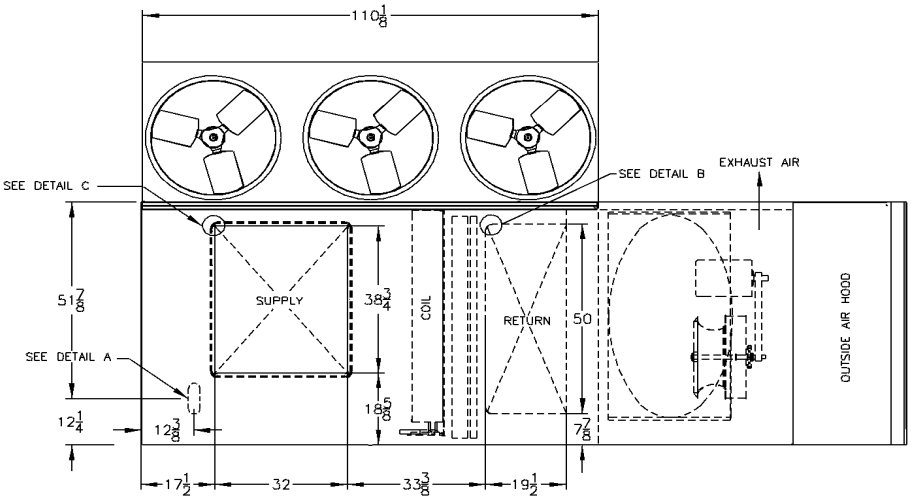
16,18 & 20 TON - 2 FANS

25 & 30 TON - 3 FANS

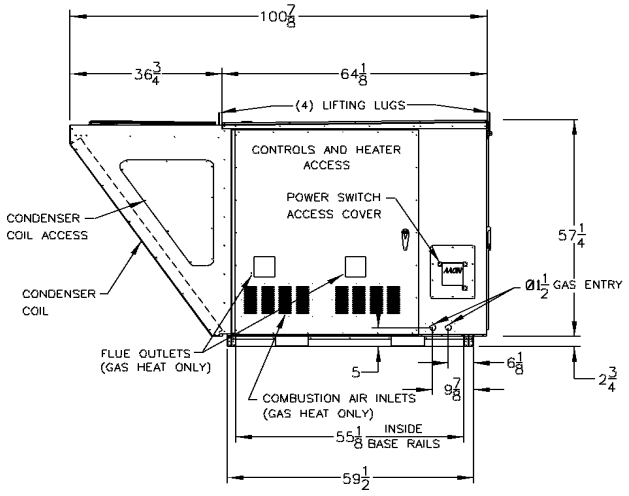


DETAIL C

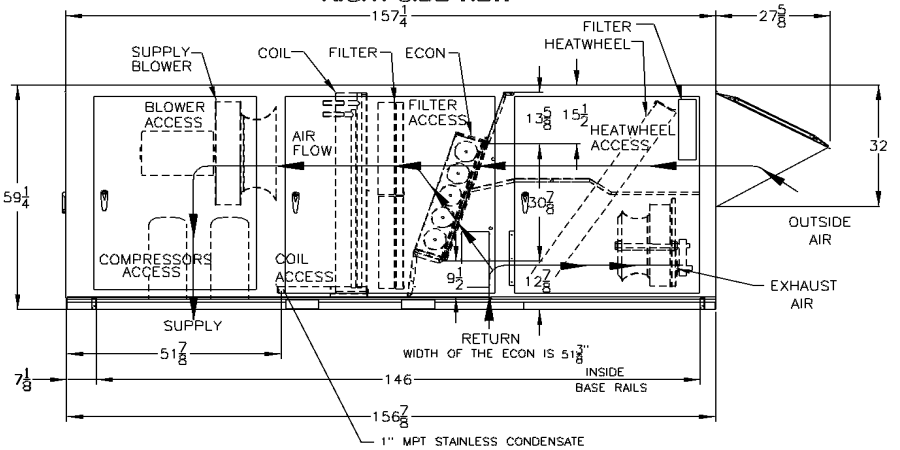
TOP VIEW



FRONT VIEW



RIGHT SIDE VIEW

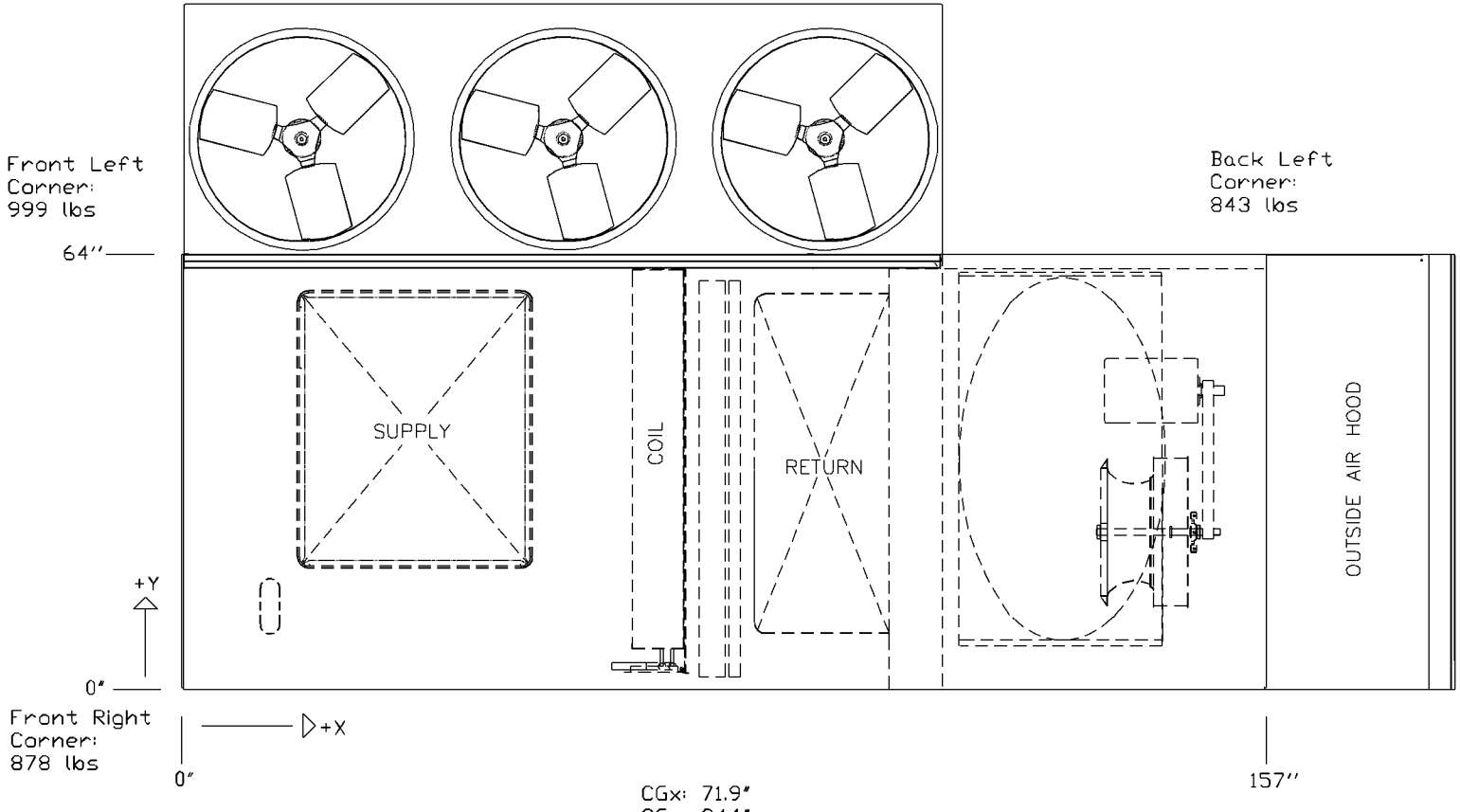


RNC-00005 REV:B 08/23/10 JWC

NOTE: ALL DIMENSIONS ARE IN INCHES

RNC CABINET
AIR COOLED CONDENSING UNIT
WITH ENERGY RECOVERY SECTION

RN-016-3-0-E60E-12A1NLG-DLB-NQG-AFA-00QABBZ-00-D000000VB



Disclaimer:
This weight estimate does not account for any SPAs.