MECHANICAL LEGEND

Symbol	Description
	SUPPLY AIR DIFFUSER
	RETURN AIR DIFFUSER
	EXHAUST AIR DIFFUSER
	DIRECTIONAL AIR FLOW
	MANUAL VOLUME DAMPER
	SUPPLY/OUTSIDE AIR DUCT UP & DOWN
	RETURN AIR DUCT UP & DOWN
	EXHAUST AIR DUCT UP & DOWN
(D)	DEMOLISH
(E)	EXISTING
	CONNECT TO EXISTING
(T) F-?	THERMOSTAT
(S)	TEMPERATURE SENSOR
?	NOTE
XX ?	EQUIPMENT DESIGNATOR
	GATE VALVE/SHUT-OFF VALVE SEE SPECS
	CHECK VALVE
	BALANCING VALVE
	FLOW CONTROL/LIMITING VALVE
	THERMOMETER
	DIRECTION OF FLOW
	PUMP
	STRAINER W/DRAIN VALVE
	PRESSURE GUAGE
	PETE'S PLUG
	DOUBLE CHECK ASSEMBLY
	PRESSURE REDUCING VALVE
	UNION
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	TRIPLE DUTY VALVE
	CAP
	MOTORIZED DAMPER
M	MOTORIZED DAMPER
	BALL/SHUT-OFF VALVE(SEE SPECS)
	FIRE DAMPER
	FIRE / SMOKE DAMPER
S	SMOKE DAMPER
M	FAN MOTOR

Abbreviation	Meaning
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
B.D.	BOTTOM OF DUCT
BHP	BRAKE HORSEPOWER
BOG	BOTTOM OF GRILLE
BTU	BRITISH THERMAL UNITS
CFM	CUBIC FEET PER MINUTE
CONN.	CONNECTION
CONT.	CONTINUATION
CW	DOMESTIC COLD WATER
DB	DRY BULB
DIA.	DIAMETER
DIST.	DISTRIBUTION
EXH	EXHAUST AIR
EDB	ENTERING DRY BULB TEMPERATURE
EWB	ENTERING WET BULB TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
FF	FINISH FLOOR
FIXT.	FIXTURE
F.O.B.	FLAT ON BOTTOM
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT.	FEET / FOOT
GA.	GAUGE
GEXH	GREASE EXHAUST AIR DUCT
GPM	GALLONS PER MINUTE
H	HEIGHT
HP	HORSEPOWER
I.D.	INSIDE DIAMETER
IN.	INCHES
L	LENGTH
LBS.	POUNDS
LDB	LEAVING DRY BULB
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MA	MAKE UP AIR
MAX.	MAXIMUM
MBH	THOUSANDS OF BTUs PER HOUR
MD	MOTORIZED DAMPER
MIN.	MINIMUM
MVD	MANUAL VOLUME DAMPER
NC	NOISE CRITERIA
N.C.	NORMALLY CLOSED
N.I.M.	NOT IN MECHANICAL
NO.	NUMBER
N.O.	NORMALLY OPEN
O.A.	OUTSIDE AIR
P	PERSON
PSI	POUNDS PER SQUARE INCH
P/T	PRESSURE / TEMPERATURE
R.A.	RETURN AIR
RECT.	RECTANGULAR
REQ'D	REQUIRED
S.A.	SUPPLY AIR
S.P.	STATIC PRESSURE
SQ.	SQUARE
TEMP.	TEMPERATURE
TYP.	TYPICAL
VAV	VARIABLE AIR VOLUME
W	WIDTH
WB	WET BULB
WPD	WATER PRESSURE DROP
ø	DIAMETER

Line type	Description
(thin line)	(E) EXISTING
(dashed line)	(D) DEMOLISH
(solid line)	NEW WORK
—G—	(G) NATURAL GAS
—CD—	(CD) CONDENSATE DRAIN
—RF—	(RF) TWO OR THREE REFRIGERANT LINES
—HWS—	(HWS) HEATING WATER SUPPLY
—HWR—	(HWR) HEATING WATER RETURN
—CHS—	(CHWS) CHILLED WATER SUPPLY
—CHR—	(CHWR) CHILLED WATER RETURN
(dotted box)	EQUIPMENT MAINTENANCE CLEARANCE AND ACCESS

MECHANICAL GENERAL NOTES

A. THE DRAWINGS ARE DIAGRAMMATIC. PROVIDE ALL MATERIAL (NEW AND UNDAMAGED) AND LABOR FOR A COMPLETE AND OPERABLE SYSTEM. VERIFY ALL BUILDING MEASUREMENTS DIMENSIONS AND EQUIPMENT LOCATIONS BEFORE PROCEEDING WITH ANY OF THE WORK.

B. VERIFY ALL EXISTING CONDITIONS RELATIVE TO THE SCOPE OF WORK. REPORT DISCREPANCIES BACK TO THE ENGINEER.

C. VERIFY INDICATED (E)DUCTWORK/PIPE SIZES PRIOR TO RECONNECTING NEW EQUIPMENT. EQUIPMENT SHALL NOT BE CONNECTED TO EXISTING DUCT/PIPE OF SMALLER DIAMETER THAN NEW DUCT/PIPE. REPORT DISCREPANCIES BACK TO ENGINEER.

D. DO NOT FABRICATE EQUIPMENT SUPPORTS/BASES W/O CONFIRMING SPACE EXISTS AND THE BUILDING ATTACHMENT POINTS.

E. REFER TO THE MECHANICAL SPECIFICATIONS FOR MATERIALS, EQUIPMENT, AND ADDITIONAL CONSTRUCTION INSTRUCTIONS NOT COVERED BY THESE PLANS.

F. ALL INSTALLATIONS SHALL COMPLY WITH APPLICABLE FEDERAL AND STATE CODES INCLUDING, 2019 OREGON STRUCTURAL SPECIALTY CODE (OSSC) INCLUDING APPENDIX N FOR OREGON FIRE CODE REGULATIONS, 2021 OREGON PLUMBING SPECIALTY CODE (OPSC), 2019 OREGON MECHANICAL SPECIALTY CODE (OMSC), 2021 OREGON ENERGY EFFICIENCY SPECIALTY CODE (OEESC)—BASED ON ASHRAE 90.1—2019, AND NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). WHERE TWO CODES DIFFER THE MORE STRICT OF THE TWO SHALL BE FOLLOWED.

G. OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES HAVING JURISDICTION. SUBMIT ALL CERTIFICATES PRIOR TO ACCEPTANCE.

H. COORDINATE ALL MECHANICAL AND CONTROL WORK WITH GENERAL CONTRACTOR, CONTROL CONTRACTOR, ELECTRICAL AND ARCHITECTURAL.

I. COORDINATE OTHER TRADES FOR PATCH/REPAIR OF WALLS WHERE EXISTING SENSORS ARE REMOVED OR MODIFIED.

J. PATCH & REPAIR WALLS / FLOORS / CEILING WHERE OLD DUCTWORK/PIPES HAVE BEEN REMOVED TO MATCH EXISTING FINISHES.

K. COORDINATE WITH OTHER CRAFTS AS REQUIRED TO COMPLETE WORK IN ACCORDANCE WITH CONSTRUCTION SCHEDULE.

L. PROVIDE OWNER INSTRUCTION BY QUALIFIED PERSONNEL ON EQUIPMENT AND SYSTEMS AT OWNER'S REQUEST.

M. ALL DUCTWORK SHALL BE GALVANIZED STEEL, UNLESS OTHERWISE INDICATED, CONFORMING TO LATEST SMACNA, ASHRAE, OMSC, NFPA, AND UL STANDARDS.

N. MANUFACTURERS AND MODEL NUMBERS LISTED IN THE EQUIPMENT SCHEDULES ARE THE BASIS OF DESIGN.

O. CUT WALLS FOR PROPER EQUIPMENT, DUCT OR PIPE INSTALLATION. FILL HOLES WHICH ARE CUT OVERSIZED FOR A TIGHT FIT AROUND OBJECTS PASSING THROUGH.

P. PROVIDE UL LISTED FIRESTOP SYSTEM TO MAINTAIN THE CODE REQUIRED F AND T RATING OF THE CONSTRUCTION ASSEMBLY AT A DUCT/PIPE PENETRATION THROUGH A RATED BUILDING CONSTRUCTION.

Q. INSTALL LABELS ON ALL MECHANICAL EQUIPMENT. SEE SPECIFICATIONS FOR CRITERIA.

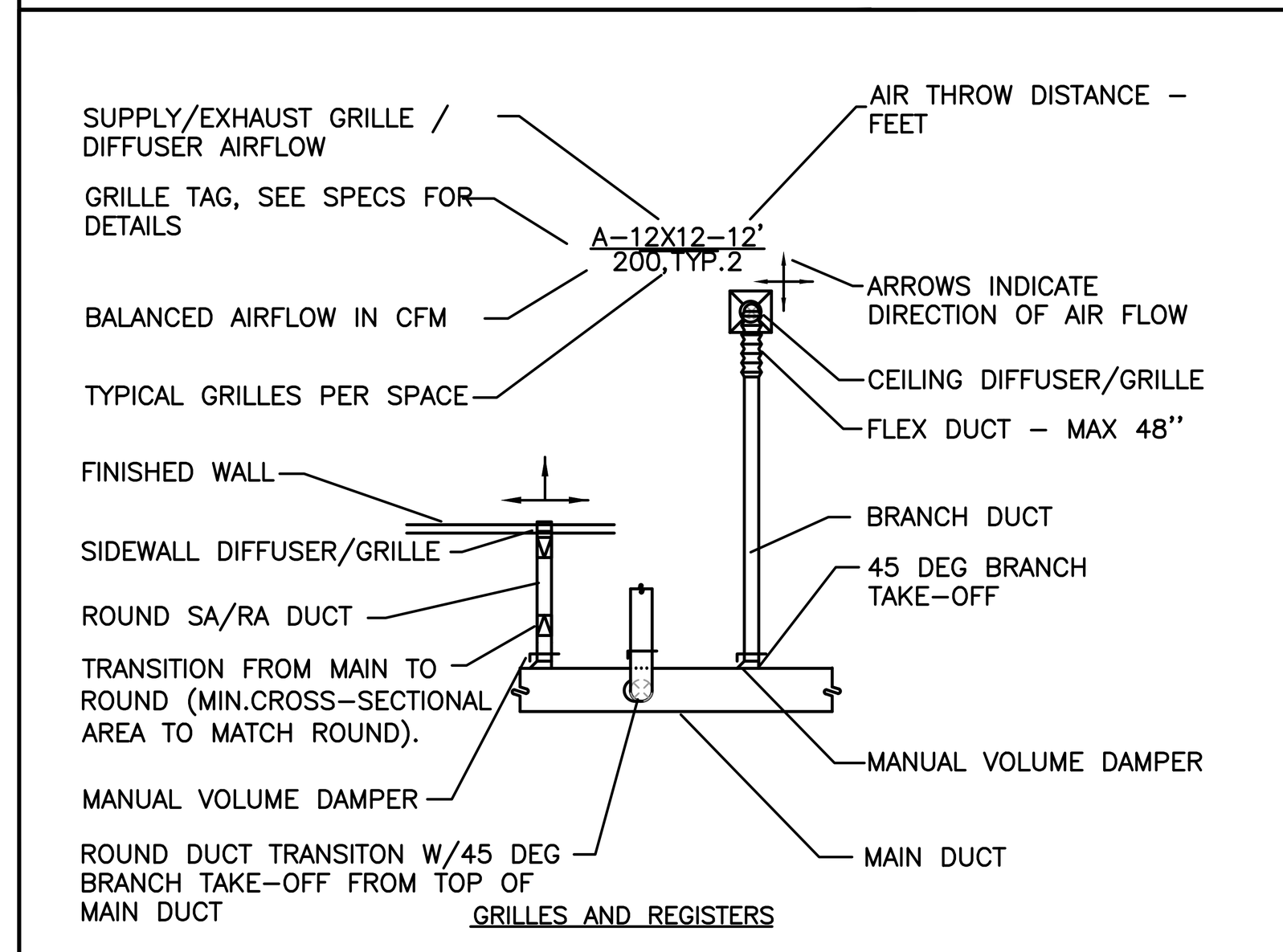
R. CONTROLS AND WIRING SHALL MEET ALL ELECTRICAL REQUIREMENTS OF APPLICABLE ELECTRICAL SPECIFICATIONS AND REQUIREMENTS OF OWNER, BUILDING OFFICIALS AND EQUIPMENT SUPPLIERS OF EQUIPMENT INSTALLED ON PROJECT.

S. ELECTRIC MOTORS SHALL HAVE BUILT-IN THERMAL OVERLOAD PROTECTION OR BE PROTECTED EXTERNALLY WITH SEPARATE THERMAL OVERLOAD DEVICES, WITH LOW-VOLTAGE RELEASE OR LOCK OUT AS REQUIRED.

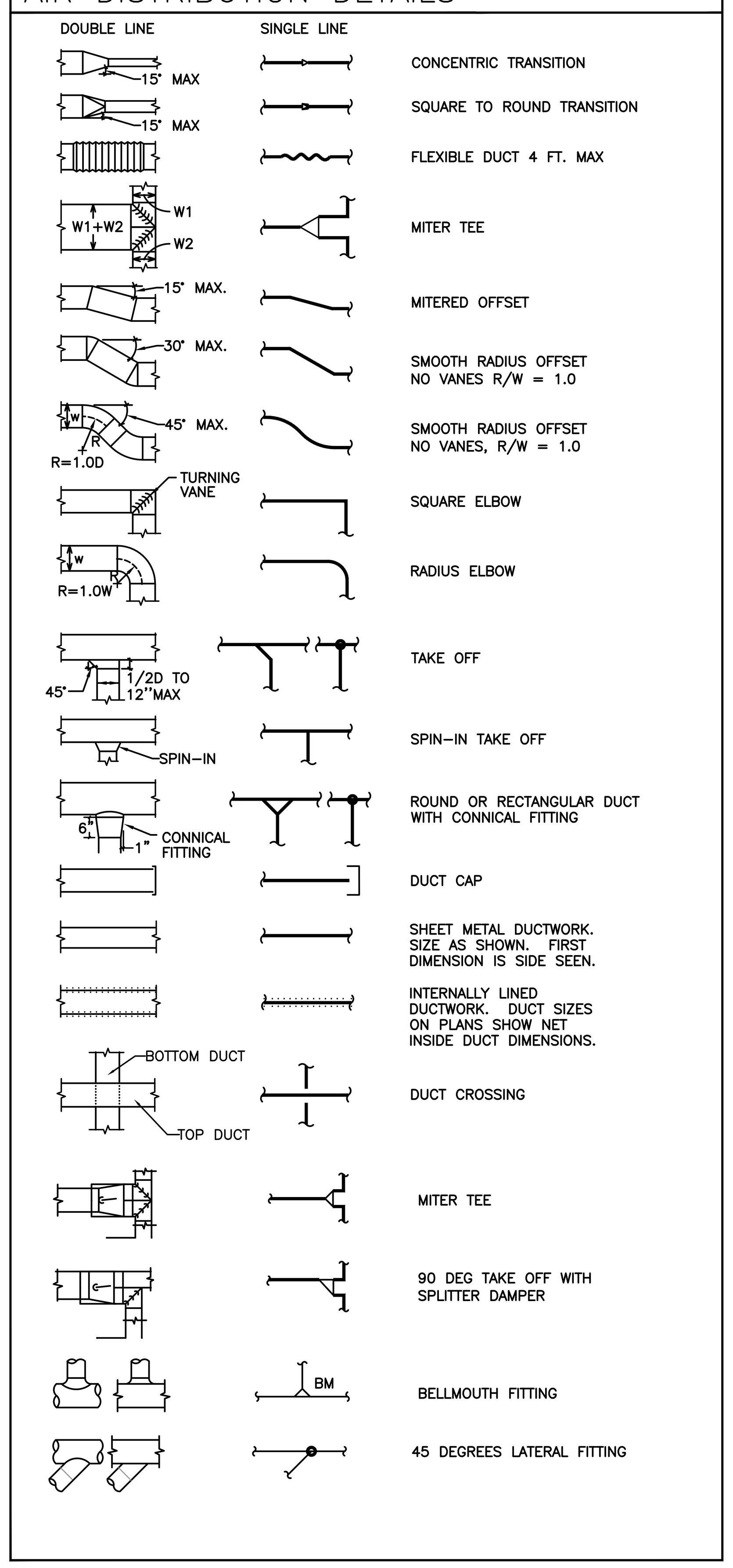
T. ALL NEW EQUIPMENT, PIPING, CONDUIT, AND DUCTWORK SHALL BE INSTALLED PER CURRENT SEISMIC CODE REQUIREMENTS.

U. PROVIDE LOW LEAK AUTOMATIC DAMPERS ON OUTSIDE AIR, EXHAUST AIR AND RELIEF AIR CONTROL DAMPERS WHERE THESE ARE INDICATED.

AIR DISTRIBUTION DETAILS



AIR DISTRIBUTION DETAILS



3.2 DUCTWORK INSULATION

A. Ductwork: Insulate the following:

1. All supply and return ductwork in systems routed in unconditioned spaces or exposed to the outside conditions.
2. All outside air intake ducts.
3. All ductwork required to be insulated by code.
4. The last 5' of duct work connected to a louver or exhaust termination.

B. Insulation Thickness: Select board and blanket insulation of thickness required to provide the following installed R-value.

1. All heating or cooling system supply and return ducts located on the exterior of the insulated building envelope, including ventilated attics, and all outside air intake ducts, R-8.
2. All heating and cooling system supply and return ducts located in unconditioned spaces within the building insulation envelope, R-5.
3. All heating and cooling system supply ducts located in conditioned spaces and where exposed in unfinished spaces or concealed from view in finished spaces, R-3.3. Exposed ductwork in finished spaces shall not be externally insulated.
4. Ducts located within or below concrete slabs on grade, R-4.

C. Fittings: Install with wire, straps, and duct adhesive as required. To prevent sagging on all rectangular or square ducts over 24" wide, install Gramweld or equal welding pins on the bottom. Maximum spacing 18" on center in both directions.

D. Installation: Applied with butt joints, all seams sealed with vapor seal mastic or taped with 2" wide vapor-proof, pressure-sensitive tape. Seal all penetrations with vapor barrier adhesive.

E. Internally Lined Ductwork: Where internally lined ductwork is indicated on the Drawings and/or specified, no exterior insulation is required. Select duct lining to provide the required R-value. Carefully lap the ends of the exterior insulation a minimum of 6" past the interior insulation unless otherwise shown. Seal the end of vapor barrier jacket to the duct with mastic where the vapor barrier is required.

E.1. Line Supply and Return ducts for 10' on intake and discharge of fan.

E.2. Line Supply ducts routed in vertical shafts directly below RTUs

EXHAUST FANS

MARK NUMBER	EF 1
TYPE	CEILING CABINET
SYSTEM	RESTROOM
CFM	110
TOTAL SP. (IN H20)	0.125
RPM	1190
TIP SPEED (FPM)	--
MOTOR WATTS OR HP	47.3 W
CONTROLLED BY	LIGHTS
INTERLOCK WITH	NONE
FAN SPEED CONTROLLER	NO
WHEEL TYPE	FC
BACK DRAFT DAMPER	GRAVITY
ISOLATION	RUBBER
DESIGN WEIGHT (LBS)	25
MAX. SONES	3.0
MAX AMPS - ***	0.40
POWER (VOLTS/PHASE/HZ) - ***	120/60/1
BASIS OF DESIGN:	BROAN A110

***— ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DEIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

MECHANICAL SHEET INDEX

VENTILATION AIR SCHEDULE - FC-1

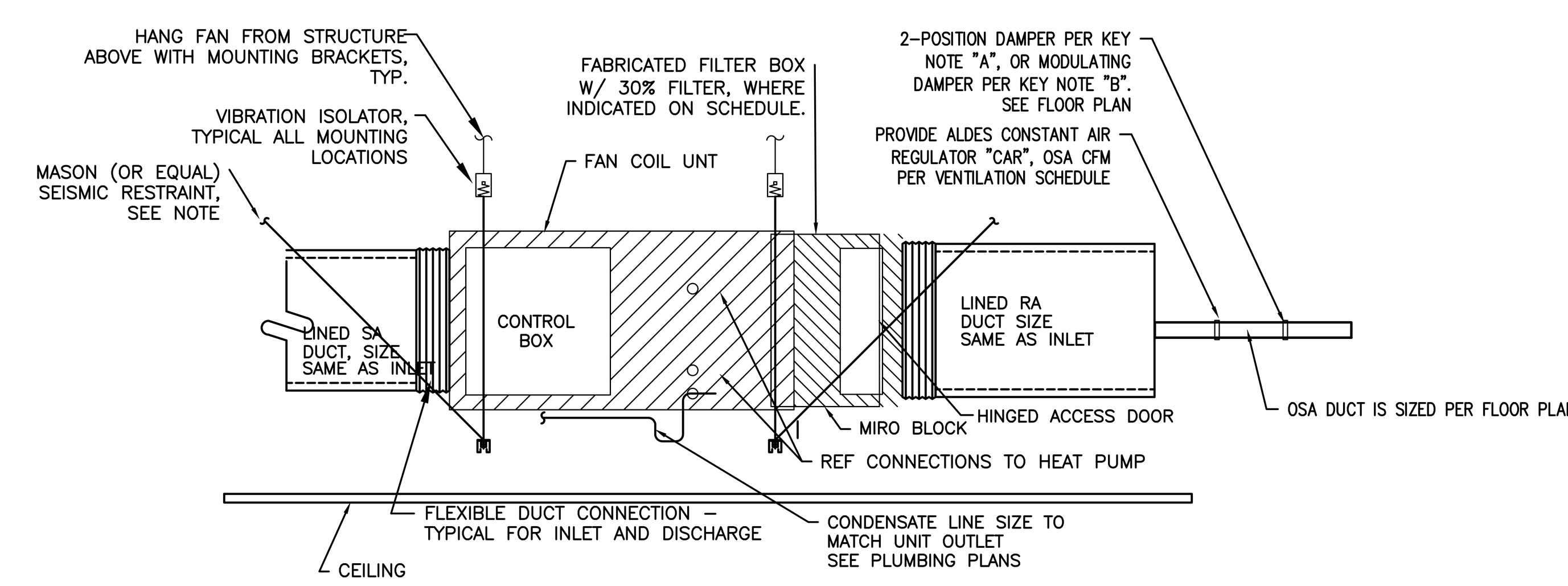
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		**Pz**	**Rp**	**Ra**	**Vbz**	**Ez**	**Voz**	**Vpz**	**Zp**			**Evz**		
LOBBY	277	0	0	0	0.06	17	0.8	21	300	0.07	523	0	1.02	21.62	FC-1
FLEX	90	5	1	5	0.06	10	0.8	13	110	0.12	0	0	0.97	13.53	FC-1
OFFICE 102	106	5	1	5	0.06	11	0.8	14	150	0.09	0	0	1.00	14.77	FC-1
OFFICE 104	111	5	1	5	0.06	12	0.8	15	150	0.10	100	0	1.00	15.17	FC-1
WORKROOM	75	5	1	5	0.06	10	0.8	12	90	0.13	100	0	0.96	12.36	FC-1
TOTAL	**659**		**4**			**60**		**74**	**800**		**723**	**0**	**0.96**	**77**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**77**	**CFM**	**Corrected OSA Fractio**		**Zs =**	**0.10**

VENTILATION AIR SCHEDULE - FC-2

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		**Pz**	**Rp**	**Ra**	**Vbz**	**Ez**	**Voz**	**Vpz**	**Zp**			**Evz**		
FITNESS	861	10	9	20	0.06	232	0.8	290	1200	0.24	910	0	1.00	289.58	FC-2
TOTAL	**861**		**9**			**232**		**290**	**1200**		**910**	**0**	**1.00**	**290**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**290**	**CFM**	**Corrected OSA Fractio**		**Zs =**	**0.24**

VENTILATION AIR SCHEDULE - FC-3

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		**Pz**	**Rp**	**Ra**	**Vbz**	**Ez**	**Voz**	**Vpz**	**Zp**			**Evz**		
LOUNGE	956	0	0	0	0.06	57	0.8	72	1200	0.06	1128	0	1.00	71.70	FC-3
TOTAL	**956**		**0**			**57**		**72**	**1200**		**1128**	**0**	**1.00**	**72**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**72**	**CFM**	**Corrected OSA Fractio**		**Zs =**	**0.06**



1 DUCTED FAN COIL
M0.01 SCALE: DETAIL

INDOOR UNITS – *

MARK NUMBER	FC-1 24 MBH ***	FC-2 36 MBH ****	FC-3 36 MBH ****
SYSTEM	FLEX/HALL/LOBBY/OFFICE	FITNESS	LOUNGE
TYPE	DUCTED	DUCTED	DUCTED
EFFICIENCY	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT
NOMINAL COOLING CAPACITY	23,600 BTUH	33,000 BTUH	33,000 BTUH
HEATING CAPACITY	24,000 BTUH/6 KW ELECT	33,000 BTUH/10 KW ELECT	33,000 BTUH/10 KW ELECT
TOTAL SUPPLY CFM	850	1150	1150
OSA CFM	XXX	XXX	XXX
EXTERNAL SP. ("H20)	0.25	0.25	0.25
VOLTS/PHASE	208/1	208/1	208/1
MCA/MOP**	29.4/35	45.5/60	45.5/60
WEIGHT	135	135	135
BASIS OF DESIGN	CARRIER FMC4Z2400AL	CARRIER FMC4Z3600AL	CARRIER FMC4Z3600AL
OUTDOOR UNIT	HP-1 2 TON	HP-2 3 TON	HP-3 3 TON

* – PROVIDE ALL UNITS THAT CANNOT BE DRAINED BY GRAVITY WITH CONDENSATE PUMP, ROUTE ALL CONDENSATE LINES HIDDEN WITHIN STRUCTURE TO AN APPROVED LOCATION PROVIDED BY THE PLUMBER.

** – ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS. ELECTRICAL CONTRACTOR RESPONSIBLE FOR SIZING ALL CONDUCTORS & OVERCURRENT PROTECTION. VERIFY WITH EQUIPMENT SUBMITTALS FOR EQUIPMENT ELECTRICAL REQUIREMENTS

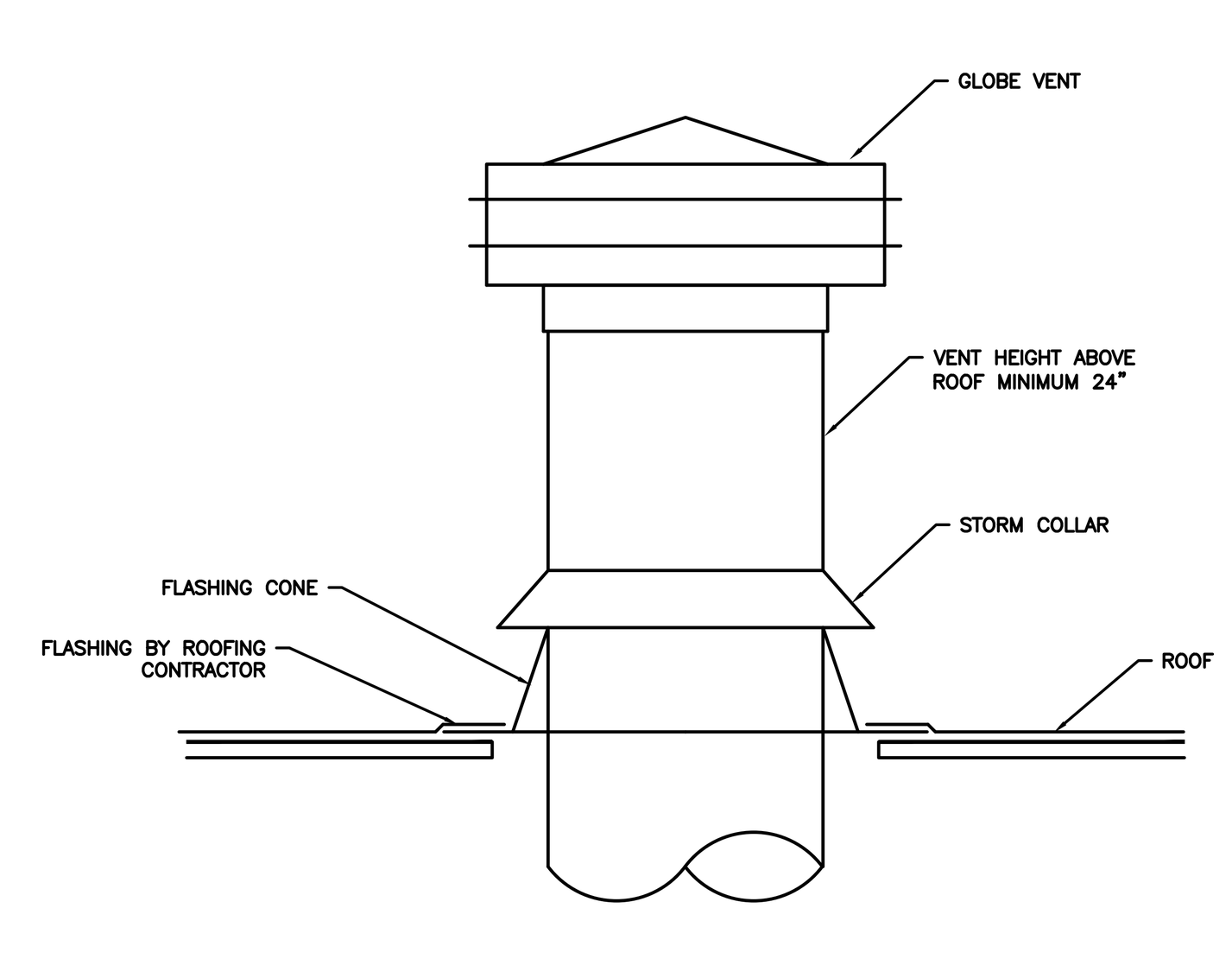
*** – ELECTRIC HEAT MODEL NUMBER EHK3-06B, 6KW 240V ELECTRIC HEAT WITH CIRCUIT BREAKER. ACCESS PANEL FOR INDOOR UNIT , MODEL # KFAGP0101COV.

**** – ELECTRIC HEAT MODEL NUMBER EHK3-10B, 10KW 240V ELECTRIC HEAT WITH CIRCUIT BREAKER. ACCESS PANEL FOR INDOOR UNIT , MODEL # KFAGP0201COV.

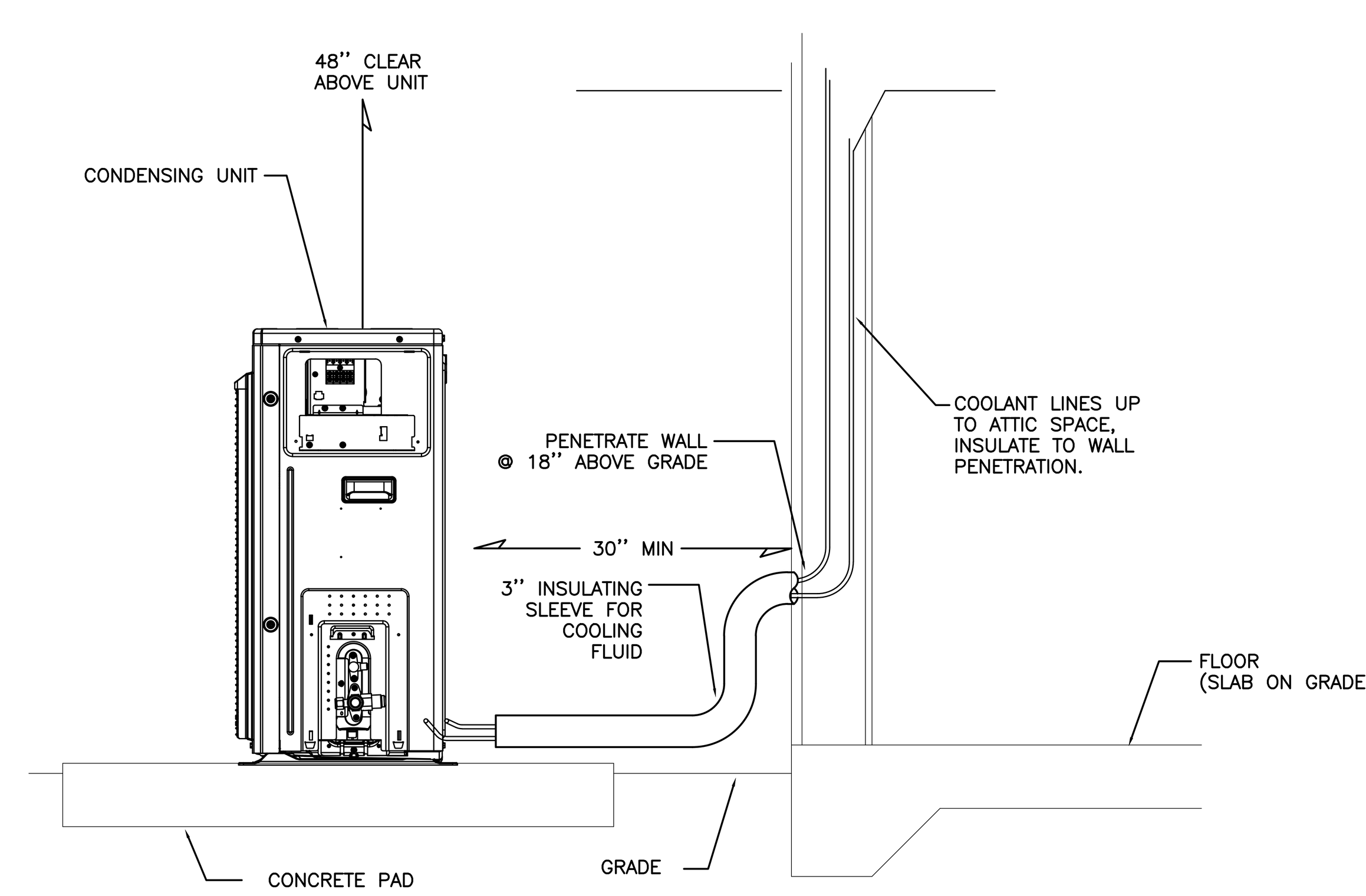
OUTDOOR UNITS – SPLIT SYSTEM HEAT PUMP

MARK NUMBER	HP-1 2 TON	HP-2 3 TON	HP-3 3 TON
SYSTEM	FLEX/HALL/LOBBY/OFFICE	FITNESS	LOUNGE
TYPE	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP
NORMAL COOLING CAPACITY	22,000 BTUH	33,000 BTUH	33,000 BTUH
NORMAL HEATING CAPACITY	30,000 BTUH	36,000 BTUH	36,000 BTUH
EFFICIENCY SEER/EER	14.0/11.5	14.0/11.7	14.0/11.7
EFFICIENCY HSPF/COP	8.2/3.88	8.2/3.85	8.2/3.85
REFRIGERANT	410 A	410 A	410 A
REFRIGERANT CHARGE	X LBS	X LBS	X LBS
MAX OPERATING TEMPS	115/5	115/5	115/5
MAX PIPING LENGTH	200 FT	200 FT	200 FT
MAX PIPING HEIGHT	80 FT	80 FT	80 FT
VOLTS-PHASE - ***	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE
MCA/MOP - ***	14.2/25 AMPS	18.3/30 AMPS	18.3/30 AMPS
COMPRESSOR	CONSTANT SPEED	CONSTANT SPEED	CONSTANT SPEED
WEIGHT	200 LBS	227 LBS	227 LBS
BASIS OF DESIGN	CARRIER 25HCE424AP06	CARRIER 25HCE436AP05	CARRIER 25HCE436AP05

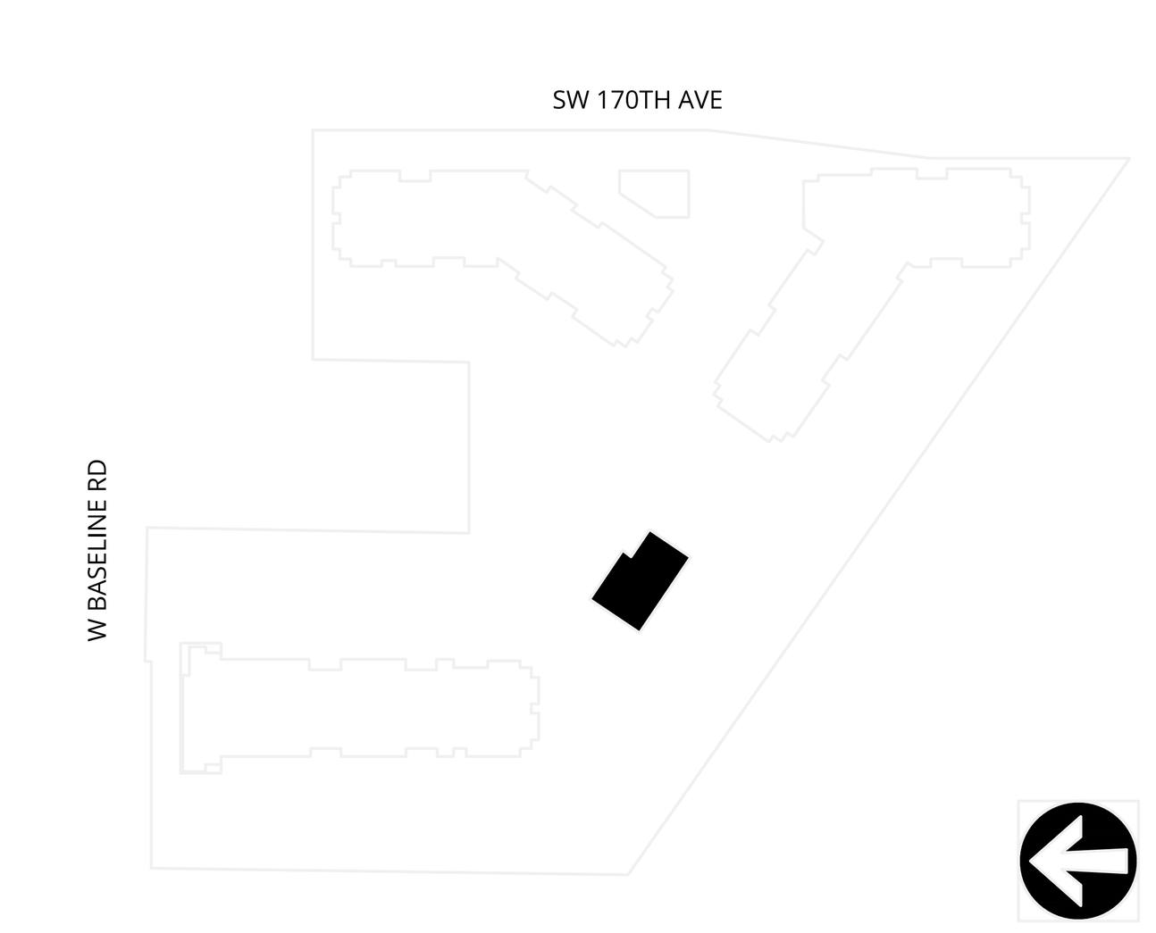
***— ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DEIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS



2 GLOBE STYLE ROOF VENT
M0.01 NOT TO SCALE



3 TYP. CONDENSER INSTALLATION
M0.01 DETAIL



KEY PLAN

09-07-22
REGISTERED PROFESSIONAL ENGINEER 54,607 OREGON JULY 11, 2000 MARK R. DENYER
EXPIRES: 31DEC23

Ankrom Moisan

38 NORTHWEST DAVIS, SUITE 300
PORTLAND, OR 97209
T 503.245.7100

1505 5TH AVE, SUITE 300
SEATTLE, WA 98101
T 206.576.1600

1014 HOWARD STREET
SAN FRANCISCO, CA 94103
T 415.252.7063

JACOBS

MFI Consulting Engineers
2007 S.E. Ash St.
Portland, OR 97214
PHN: (503) 234-0548
CONTACT: MATT AUTRY

ELMONICA STATION APARTMENTS BUILDING 4
SW 170TH AND W BASELINE
REMBOLD PROPERTIES

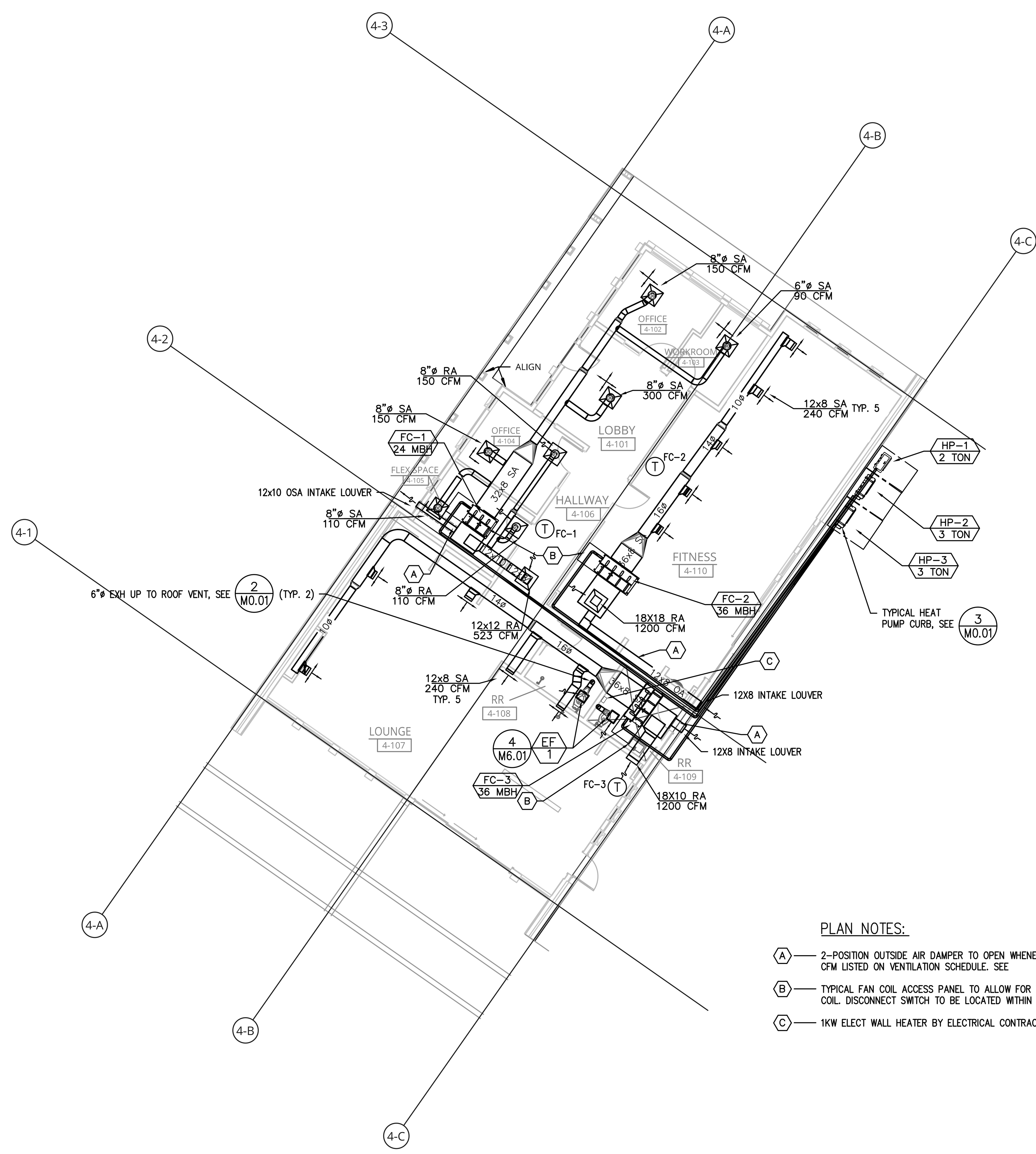
REVISION	DATE	REASON FOR ISSUE

TITLE SHEET, MECHANICAL SHEETS & DETAILS

PERMIT SET

DATE 09/23/2022
PROJECT NUMBER 215390

M0.01-4



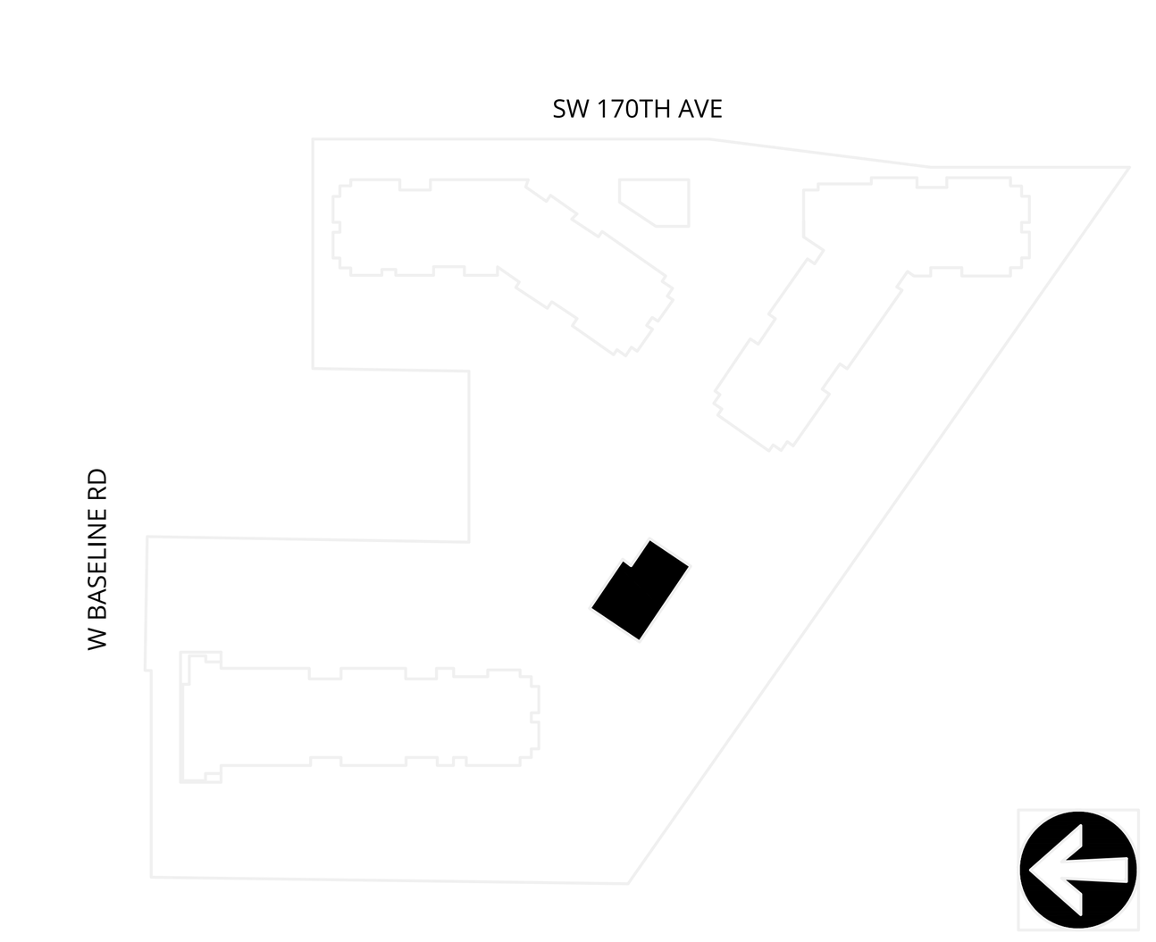
1 M2.01 BUILDING 4 — LEVEL 1 — MECHANICAL PLAN
SCALE: 1/8" = 1'-0"

PLAN NOTES:

(A) 2–POSITION OUTSIDE AIR DAMPER TO OPEN WHENEVER UNIT OPERATES (PROVIDE CAR DAMPER SET TO OSA CFM LISTED ON VENTILATION SCHEDULE. SEE

(B) TYPICAL FAN COIL ACCESS PANEL TO ALLOW FOR FULL MAINTENANCE ACCESS AND FULL REMOVAL OF FAN COIL. DISCONNECT SWITCH TO BE LOCATED WITHIN REACH OF ACCESS PANEL. 1 M0.01

(C) 1KW ELECT WALL HEATER BY ELECTRICAL CONTRACTOR, SHOWN FOR REFERENCE



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PORTLAND, OR 97209
T 503.245.7100

1505 5TH AVE, SUITE 300
SEATTLE, WA 98101
T 206.576.1600

1014 HOWARD STREET
SAN FRANCISCO, CA 94103
T 415.252.7063

MFIA INC.
Consulting Engineers
2007 S.E. Ash St.
Portland, OR 97214
PHN: (503) 234-0548
FAX: (503) 234-0677
WWW.MFIA-ENG.COM
CONTACT: MATT AUTRY

ELMONICA STATION APARTMENTS BUILDING 4

SW 170TH AND W BASELINE

REMBOLD PROPERTIES

REVISION	DATE	REASON FOR ISSUE

LEVEL 1 - MECHANICAL PLAN

PERMIT SET

DATE	PROJECT NUMBER
09/23/2022	215390

M2.01-4