

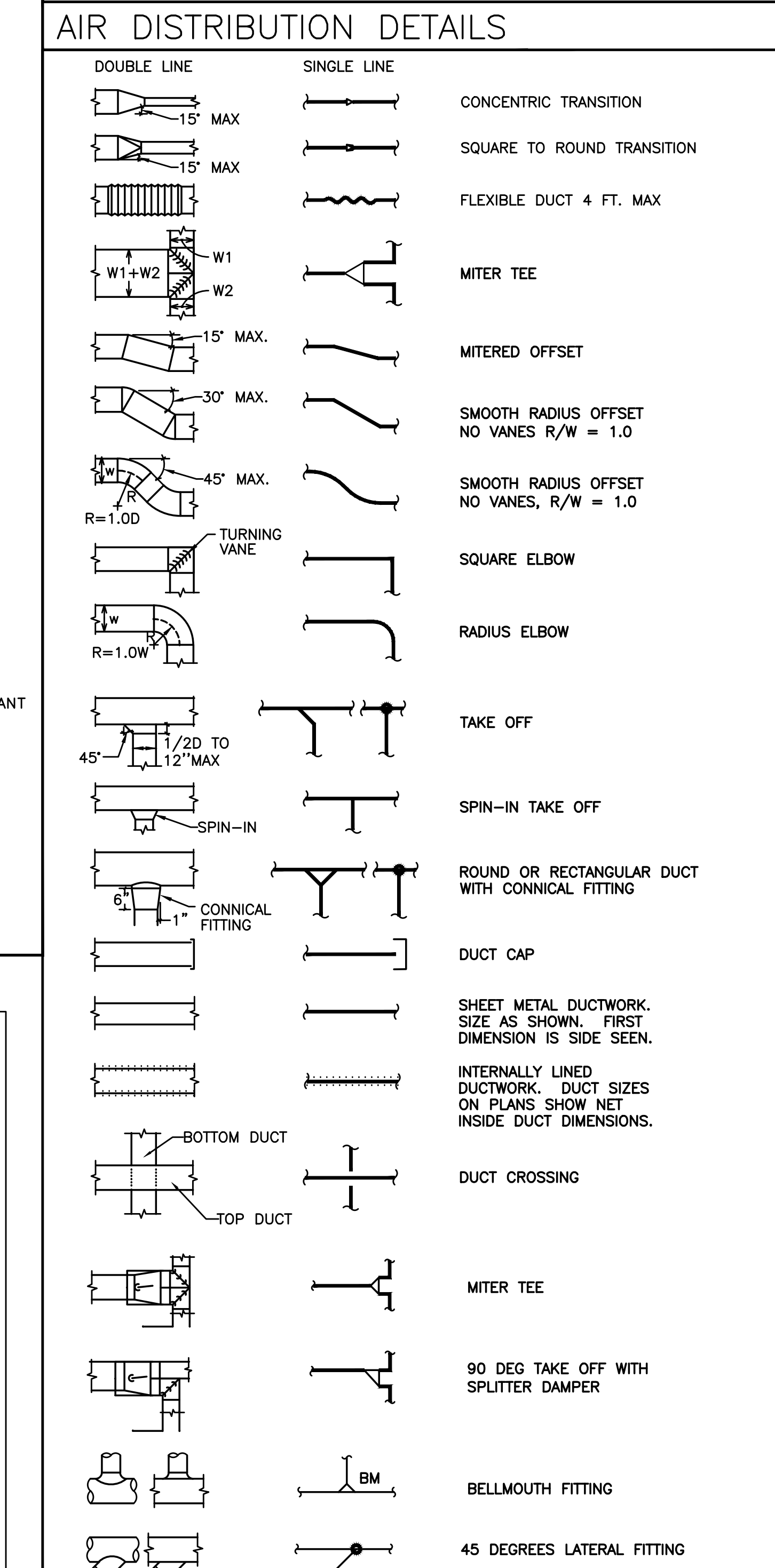
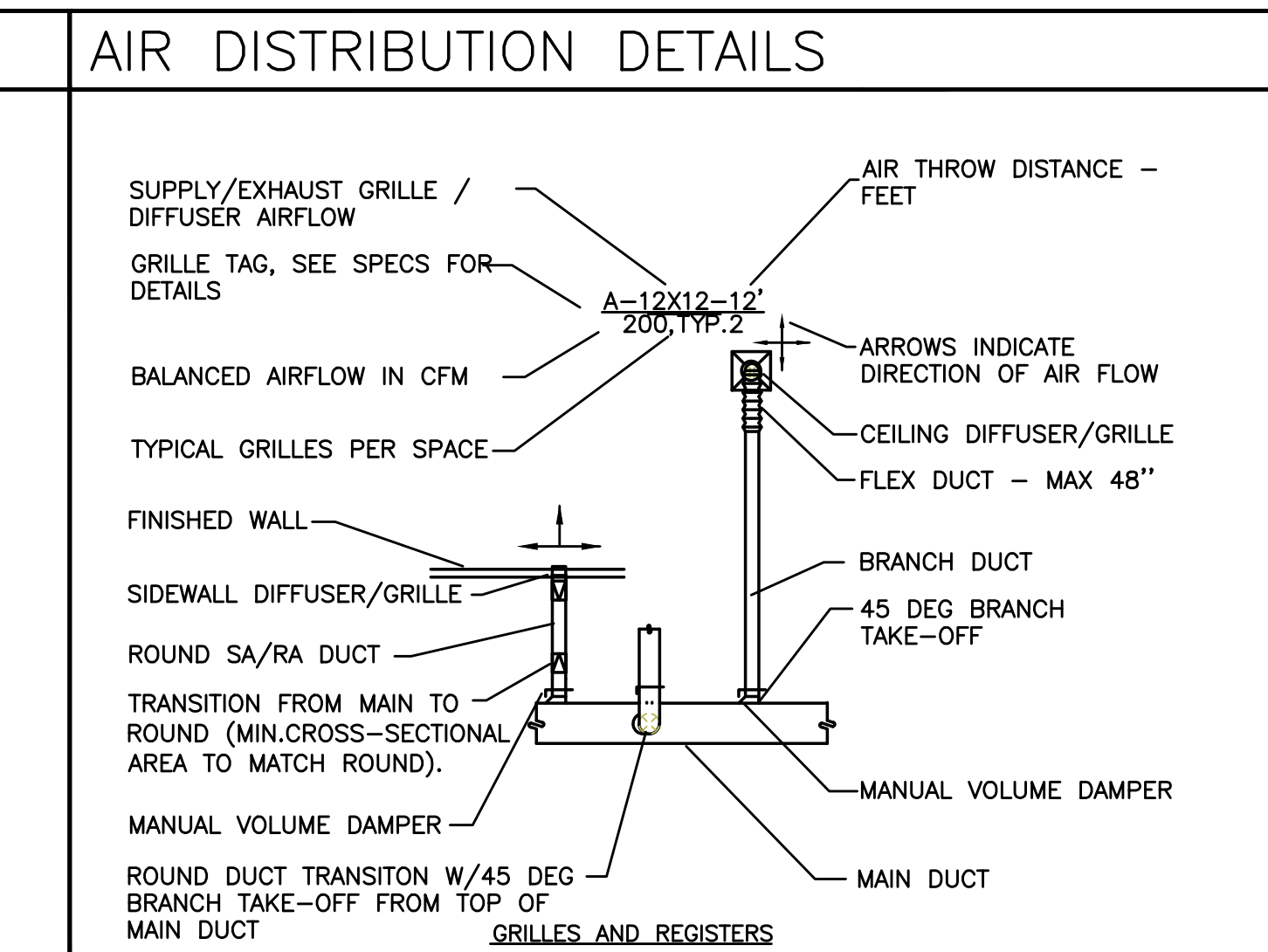
### MECHANICAL LEGEND

	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
	DEMOLISH		EXISTING
	CONNECT TO EXISTING		THERMOSTAT
	TEMPERATURE SENSOR		NOTE
	EQUIPMENT DESIGNATOR		GATE VALVE/SHUT-OFF VALVE SEE SPECS
	CHECK VALVE		BALANCING VALVE
	FLOW CONTROL/LIMITING VALVE		THERMOMETER
	DIRECTION OF FLOW		PUMP
	STRAINER W/RAIN VALVE		PRESSURE GAUGE
	PET'S PLUG		DOUBLE CHECK ASSEMBLY
	PRESSURE REDUCING VALVE		UNION
	2-WAY CONTROL VALVE		3-WAY CONTROL VALVE
	TRIPLE DUTY VALVE		CAP
	MOTORIZED DAMPER		BALL/SHUT-OFF VALVE(SEE SPECS)
	FIRE DAMPER		FIRE / SMOKE DAMPER
	SMOKE DAMPER		FAN MOTOR

- ### 3.2 DUCTWORK INSULATION
- A. Ductwork: Insulate the following:
- All supply and return ductwork in systems routed in unconditioned spaces or exposed to the outside conditions.
  - All outside air intake ducts.
  - All ductwork required to be insulated by code.
  - The last 5' of duct work connected to a lower or exhaust termination.
- B. Insulation Thickness: Select board and blanket insulation of thickness required to provide the following installed R-value.
- 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.
  - All heating and cooling system supply and return ducts located in unconditioned spaces within the building insulation envelope, R-5.
  - 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.
  - 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 crumpled 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.

### VENTILATION AIR SCHEDULE - LOBBY - CORRIDOR

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/PPM)	OUTSIDE AIR REQUIRED (CFM)	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 100	382	0	0	0.06	23	1.0	23	25	0.92	0	24	0.49	46.78		
CORRIDOR 200	218	0	0	0.06	13	1.0	13	40	0.33	0	40	1.08	26.70	ERV-2	
CORRIDOR 300	218	0	0	0.06	13	1.0	13	40	0.33	0	40	1.08	26.70	ERV-2	
CORRIDOR 400	218	0	0	0.06	13	1.0	13	40	0.33	0	40	1.08	26.70	ERV-2	
CORRIDOR 500	218	0	0	0.06	13	1.0	13	40	0.33	0	40	1.08	26.70	ERV-2	
<b>TOTAL</b>	<b>1254</b>	<b>0</b>	<b>0</b>	<b>0.06</b>	<b>75</b>	<b>1.0</b>	<b>75</b>	<b>185</b>	<b>0.75</b>	<b>0</b>	<b>184</b>	<b>0.49</b>	<b>154</b>		
				<b>CORRECTED TOTAL OUTDOOR AIR FLOW RATE</b>	<b>154</b>	<b>CFM</b>	<b>Corrected OSA Fraction</b>	<b>Zs =</b>	<b>0.83</b>						



### SYSTEM COMMISSIONING-VERIFICATION AND TESTING REQUIREMENTS:

ASHRAE 90.1-2019 REQUIREMENTS SECTION 4.2.5 THROUGH 4.2.5.3

THE OWNER OR GC SHALL PROCURE A COMMISSIONING PROVIDER THAT MEETS ONE OF THE FOLLOWING.

THE COMMISSIONING PROVIDER SHALL BE:

- A THIRD PARTY ENTITY NOT ASSOCIATED WITH THE BUILDING PROJECT
- AN OWNER'S QUALIFIED EMPLOYEE
- AN INDIVIDUAL ASSOCIATED WITH THE DESIGN FIRM, BUT NOT DIRECTLY ASSOCIATED WITH THE DESIGN OR INSTALLATION OF THE BUILDING SYSTEMS.

EXCEPTIONS:

- BUILDING IS LESS THAN 10,000 SQ FT

CONTRACTOR RESPONSIBILITIES

- THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING ALL THE REQUIREMENTS OF ASHRAE 90.1-2019.
- THE GENERAL CONTRACTOR OR OWNER SHALL HIRE AND UTILIZE AN APPROVED CX AGENT
- THE CX AGENT SHALL:
  - PREPARE A CX PLAN
  - OVERSEE THE TAB MEASUREMENTS
  - CONDUCT THE PRE-FUNCTIONAL & FUNCTIONAL TESTS
  - PREPARE THE PRELIMINARY CX REPORT
  - REVIEW THE TAB REPORT
  - REVIEW THE O&M'S
  - PREPARE THE SYSTEMS MANUALS

SYSTEMS REQUIRED TO BE COMMISSIONED

- SERVICE WATER HEATERS
- MIXING VALVES & RECIRC SYSTEMS
- ROOFTOP UNIT - HALLWAY VENTILATION
- SPLIT SYSTEM FAN COILS
- FTHP'S (SAMPLE SELECTION)
- DWELLING UNIT EXHAUST FANS (SAMPLE SELECTION)
- LIGHTING CONTROL SYSTEMS
- OCCUPANCY SENSORS
- EMERGENCY POWER SYSTEMS (GENERATOR)
- THERMOSTAT OPERATIONS AND SET POINTS
- FIRE PIT 7 BBQ TIMERS AND AUTO-SHUT OFF
- FIRE PUMP AND DOMESTIC WATER BOOSTER PUMP.

### MECHANICAL GENERAL NOTES

- 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.
- VERIFY ALL EXISTING CONDITIONS RELATIVE TO THE SCOPE OF WORK. REPORT DISCREPANCIES BACK TO THE ENGINEER.
- 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.
- DO NOT FABRICATE EQUIPMENT SUPPORTS/BASES W/O CONFIRMING SPACE EXISTS AND THE BUILDING ATTACHMENT POINTS.
- REFER TO THE MECHANICAL SPECIFICATIONS FOR MATERIALS, EQUIPMENT, AND ADDITIONAL CONSTRUCTION INSTRUCTIONS NOT COVERED BY THESE PLANS.
- 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.
- OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES HAVING JURISDICTION. SUBMIT ALL CERTIFICATES PRIOR TO ACCEPTANCE.
- COORDINATE ALL MECHANICAL AND CONTROL WORK WITH GENERAL CONTRACTOR, CONTROL CONTRACTOR, ELECTRICAL AND ARCHITECTURAL.
- COORDINATE OTHER TRADES FOR PATCH/REPAIR OF WALLS WHERE EXISTING SENSORS ARE REMOVED OR MODIFIED.
- PATCH & REPAIR WALLS / FLOORS / CEILING WHERE OLD DUCTWORK/PIPES HAVE BEEN REMOVED TO MATCH EXISTING FINISHES.
- COORDINATE WITH OTHER CRAFTS AS REQUIRED TO COMPLETE WORK IN ACCORDANCE WITH CONSTRUCTION SCHEDULE.
- PROVIDE OWNER INSTRUCTION BY QUALIFIED PERSONNEL ON EQUIPMENT AND SYSTEMS AT OWNER'S REQUEST.
- ALL DUCTWORK SHALL BE GALVANIZED STEEL, UNLESS OTHERWISE INDICATED, CONFORMING TO LATEST SMACNA, ASHRAE, OMSC, NFPA, AND UL STANDARDS.
- MANUFACTURERS AND MODEL NUMBERS LISTED IN THE EQUIPMENT SCHEDULES ARE THE BASIS OF DESIGN.
- CUT WALLS FOR PROPER EQUIPMENT, DUCT OR PIPE INSTALLATION. FILL HOLES WHICH ARE CUT OVERSIZED FOR A TIGHT FIT AROUND OBJECTS PASSING THROUGH.
- 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.
- INSTALL LABELS ON ALL MECHANICAL EQUIPMENT. SEE SPECIFICATIONS FOR CRITERIA.
- 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.
- 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.
- ALL NEW EQUIPMENT, PIPING, CONDUIT, AND DUCTWORK SHALL BE INSTALLED PER CURRENT SEISMIC CODE REQUIREMENTS.
- PROVIDE LOW LEAK AUTOMATIC DAMPERS ON OUTSIDE AIR, EXHAUST AIR AND RELIEF AIR CONTROL DAMPERS WHERE THESE ARE INDICATED.

### EXHAUST FANS

MARK NUMBER	CEILING CABINET	CEILING CABINET	CEILING CABINET	CEILING CABINET
TYPE	BATHROOM	TRASH	ELECTRICAL	BIKE
CFM	30/80	100	100	100
TOTAL SP. (N H2O)	0.20	0.125	0.125	0.125
RPM	1062/1146	1250	1250	1250
TIP SPEED (FPM)	NA	-	-	-
MOTOR WATTS OR HP	5/11.7 W	100 W	100 W	100 W
CONTROLLED BY	**	CONTINUOUS	T-STAT	T-STAT
INTERLOCK WITH	MOTION SENSOR	NONE	NONE	NONE
FAN SPEED CONTROLLER	YES	NO	NO	NO
WHEEL TYPE	BI	FC	FC	FC
BACK DRAFT DAMPER	YES	GRAVITY	GRAVITY	GRAVITY
ISOLATION	RUBBER	RUBBER	RUBBER	RUBBER
DESIGN WEIGHT (LBS)	25	25	25	25
MAX. SONES	0.3/0.6	1.5	1.5	1.5
MAX AMPS - ***	0.27	1.3	1.3	1.3
POWER (VOLTS/PHASE/HZ) - ***	120/1/60	120/60/1	120/60/1	120/60/1
BASIS OF DESIGN:	PANASONIC * PV-05-11VKSU2	BROAN L100	BROAN L100	BROAN L100

\* - FAN TO RUN AT LOW SPEED CONTINUOUSLY, AND INCREASE TO HIGH SPEED UPON ACTIVATION OF THE MOTION SENSOR.  
 \*\*\*- ELECTRICAL DATA LISTED FOR REFERENCE ONLY. COORDINATE WITH ELECTRICAL DESIGN CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

### MECHANICAL SHEET INDEX

M0.01	TITLE SHEET & MECHANICAL LEGEND
M3.01	MECH FLOOR PLAN - LEVEL 1
M3.02	MECH FLOOR PLAN - LEVEL 2
M3.03	MECH FLOOR PLAN - LEVEL 3
M3.04	MECH FLOOR PLAN - LEVEL 4
M3.05	MECH FLOOR PLAN - LEVEL 5
M3.06	MECH FLOOR PLAN - ROOF
M6.00	MECHANICAL DETAILS
M6.01	MECHANICAL DETAILS
M6.02	MECHANICAL DETAILS

### ENERGY RECOVERY VENTILATOR

MARK NUMBER	ERV-1 05 CFM	ERV-2
SYSTEM	DWELLING UNIT	CORRIDOR
CFM	65/105 CFM	40 CFM
CORE TYPE	MEDIA MEMBRANE	ENTHALPY PLATE
CONTROL	*	CONTROL
HEAT	NONE	NONE
VOLTS-PHASE	120/1	120/1
AMP RATING	0.9	0.15
ESP (*H2O)	0.20	0.10
EFFICIENCY @64CFM & 95F	68%	36%
WATTS *(HIGH/LOW)	103	154/60
WEIGHT	40 LBS	30 LBS
BASIS OF DESIGN	BROAN** ERV100S	PANASONIC FV-04VE1

\*\* PROVIDE V20W, 20 MINUTE PUSH BUTTON TIMER, PROVIDES HIGH SPEED VENTILATION. UNIT TO RUN AT 65 CFM CONTINUOUS, AND 105 CFM IN BOOST MODE  
 \*\*\* ELECTRICAL DATA LISTED FOR REFERENCE ONLY. COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

### DEFERRED SUBMITTALS - MECHANICAL

DEFERRED SUBMITTALS SHOWING THE ANCHOR DETAILS AND CALCULATION WILL BE PROVIDED TO THE CITY OF PORTLAND 30 DAYS PRIOR TO THE START OF WORK AND SHALL INCLUDE THE FOLLOWING EQUIPMENT

EQUIPMENT	DESCRIPTION	WEIGHT	SUBMITTED	INSPECTOR CHECK
HP-1,2,3,4	HP CONDENSING UNIT (ROOFTOP)	135 LBS		

### ELEC HEATER

MARK NUMBER	RADIANT PANEL
DESCRIPTION	DOG WASH/BIKE
LOCATION	DOG WASH/BIKE
SIZE	24X48
WATTS	750
AMPS	3.6
CONTROLLED BY:	WALL T-STAT
POWER (VOLTS/PHASE) *	208/1
DESIGN WEIGHT (LBS)	30
BASIS OF DESIGN:	BERKO CP758F

\* - ELECTRICAL DATA LISTED FOR REFERENCE ONLY. COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

### FIRE PENETRATION REQUIREMENTS FOR DUCTS:

2019 OMSC (OREGON MECHANICAL SPECIALTY CODE) & 2019 OSSC (OREGON STRUCTURAL SPECIALTY CODE)

CODE SECTIONS - SPECIFIC REQUIREMENTS, EXCEPTIONS AND DESIGN APPROACH REQUIREMENTS.

SECTION 607.6 - HORIZONTAL ASSEMBLIES  
 PENETRATIONS BY DUCTS OF A FLOOR/CEILING OR ROOF/CEILING ASSEMBLY SHALL BE PROTECTED BY A SHAFT ENCLOSURE THAT COMPLIES WITH SECTIONS 713, 717.6.1 THROUGH 717.6.3 (OSSC)  
 (SEE BELOW FOR VERTICAL ASSEMBLIES/SHAFT PENETRATIONS OR VERTICAL FIRE PARTITIONS - THIS WILL APPLY TO ALL DUCTS THAT ARE ROUTED UP IN A RATED SHAFT), OR  
 SECTIONS 607.6.1 THROUGH 607.6.3 THROUGH PENETRATIONS OF NOT MORE THAN TWO FLOORS TO BE PROTECTED WITH EITHER LISTED FIRE DAMPER OR A THROUGH PENETRATION PER SECTION 714.4  
 EXCEPTIONS: DUCTS PERMITTED TO PENETRATE THREE FLOORS OR LESS IF ALL 5 EXCEPTIONS ARE MET UNDER SECTION 607.6.1.

SECTION 607.5.5 FLAT ENCLOSURES - PENETRATIONS ARE PERMITTED BY DUCTS WITH A LISTED FIRE AND SMOKE DAMPER OR  
 EXCEPTIONS: (THE FOLLOWING EXCEPTIONS ARE USED IN PART OR IN WHOLE ON THIS PROJECT)  
 1. FIRE DAMPERS ARE NOT REQUIRED FOR ANY OF THE FOLLOWING  
 1.1 STEEL EXHAUST SUBDUCKS ARE EXTENDED NOT LESS THAN 22 INCHES ON A SUBDUCK SYSTEM WITH CONTINUOUS FLOW  
 1.2 PENETRATIONS ARE TESTED IN ACCORDANCE WITH ASTM E119 OR UL263 (SEE ATTACHED CUT SHEETS ON UL PENETRATION DETAILS)  
 2. GROUP R OCCUPANCIES USING A SUB DUCT SYSTEM AS NOTED ABOVE.  
 3. SMOKE DAMPERS ARE NOT REQUIRED AT PENETRATIONS OF EXHAUST SHAFTS IN PARKING GARAGES WHEN SHAFTS ARE SEPARATED FROM OTHER SHAFTS BY NOT LESS THAN A 2 HOUR RATING.  
 4. FIRE OR FIRE SMOKE DAMPERS ARE NOT REQUIRED IN KITCHEN OR CLOTHES DRYER EXHAUST SYSTEMS.

OSSC SECTION 713.8 PENETRATIONS.  
 PENETRATIONS IN A SHAFT ENCLOSURE SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714 AS REQUIRED FOR FIRE BARRIERS.

SECTION 714.2 A LISTED PENETRATION FIRESTOP SYSTEM SHALL BE INSTALLED.  
 SECTION 714.4.1 THROUGH PENETRATIONS  
 EXCEPTIONS #2  
 THE MATERIAL USED TO FILL THE ANNULAR SPACE SHALL PREVENT THE PASSAGE OF FLAME AND HOT GASSES SUFFICIENT TO IGNITE COTTON WASTE WHEN SUBJECTED TO ASTM E119 OR UL 263.

SECTION 714.4.1.2 THROUGH PENETRATION FIRE STOP SYSTEM  
 THROUGH PENETRATIONS SHALL BE PROTECTED BY AN APPROVED PENETRATION FIRE STOP SYSTEM INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E814 OR UL1479 (ASSEMBLY TEST) AND SHALL HAVE A F RATING NOT LESS THAN THE REQUIRED FIRE RESISTIVE RATING OF THE WALL PENETRATING.

DUCT CONSTRUCTION AND ROUTING:  
 \* UNLESS PROJECT EXPLICITLY USES A SUB DUCT SYSTEM, SERVED BY ROOF FANS ON A BACK UP POWER SUPPLY, ALL DUCTS ARE ROUTED INDIVIDUALLY TO SIDEWALL OR ROOF TERMINATIONS WITH NO INTER-CONNECTIONS OF DUCT WORK.  
 \* ALL DUCTWORK IS TO BE CONSTRUCTED PER OMSC AND PER SMACNA STANDARDS PER THE REQUIRED PRESSURE CLASSES. ALL DUCTWORK WILL BE SEALED TO BE AIR-TIGHT AND WILL NOT ALLOW TRANSFER OF SMOKE BETWEEN UNITS OR TO LEAK SMOKE INTO SHAFTS.

BUILDING CONSTRUCTION, FIRE RATED WALLS AND RATED SHAFTS:  
 \* SEE ARCHITECTURAL LIFE SAFETY PLANS FOR RATED WALLS AND SHAFTS  
 \* SEE ARCHITECTURAL WALL, SECTION DETAILS AND SHAFT WALL CONSTRUCTION DETAILS FOR REQUIRED FIRE RATINGS AND CONSTRUCTION METHODS  
 \* PROVIDE A UL LISTED FIRE STOP SYSTEM TO MATCH DUCT CONSTRUCTION AND WALL OR FLOOR CEILING CONSTRUCTION TO ENSURE COMPLIANCE WITH ASTM E119 AND UL 263 STANDARDS - WHICH IS DEMONSTRATED BY THE USE OF UL CONSTRUCTION METHODS COMPLYING WITH ASTM E814 OR UL1479.

- ### GENERAL NOTES:
- FOR ADDITIONAL EQUIPMENT INFORMATION AND REQUIREMENTS, SEE SPECIFICATIONS & EQUIPMENT SUBMITTALS.
  - MAINTAIN WALL ASSEMBLY FIRE RATING FOR INSTALLATION OF WALL HEATERS IN FIRE RATED WALLS. COORDINATE INSTALLATION WITH ARCHITECTURAL DRAWINGS.
  - ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR, TYPICAL ALL UNITS.
  - ALL DWELLING UNITS ARE VENTILATED BY NATURAL VENTILATION OR ERV'S. OPERABLE WINDOW & DOOR AREAS HAVE BEEN SIZED TO PROVIDE A MINIMUM OF 4% OF THE FLOOR AREA.
  - HALLWAYS ARE VENTILATED BY ERV'S PROVIDING OUTSIDE AIR THAT MEETS THE CODE MINIMUM 0.06 CFM/SQFT REQUIRED BE CODE.
  - ALL EQUIPMENT AND DUCTWORK IS LOCATED BELOW RATED ASSEMBLY.

### OUTDOOR UNITS - SPLIT SYSTEM HEAT PUMP

MARK NUMBER	HP-1 1/4 TON	HP-2 1 TON	HP-3 1.5 TON
SYSTEM	STUDIO	1 BEDROOM	1ST FLOOR LOBBY
TYPE	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP
NORMAL COOLING CAPACITY	9,000 BTUH	12,000 BTUH	16,000 BTUH
NORMAL HEATING CAPACITY	9,000 BTUH	12,000 BTUH	18,000 BTUH
EFFICIENCY SEER/EER	28.1/16.2	25.5/14	19/12.5
EFFICIENCY HSPF/COP	13/3.81	13/3.81	9/3.3
REFRIGERANT	410 A	410 A	410 A
REFRIGERANT CHARGE	X LBS	X LBS	X LBS
MAX OPERATING TEMPS	115/5	115/5	122/-22
MAX PIPING LENGTH	82 FT	82 FT	98 FT
MAX PIPING HEIGHT	32 FT	32 FT	65 FT
VOLTS-PHASE - **	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE
MCA/MOP - **	15/15 AMPS	15/15 AMPS	18/25 AMPS
COMPRESSOR	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED
WEIGHT	100 LBS	100 LBS	120 LBS
BASIS OF DESIGN	CARRIER 38MARBQ9AA3	CARRIER 38MARBQ12AA3	CARRIER 38MAGB18R-3

\*\* - ELECTRICAL DATA LISTED FOR REFERENCE ONLY. COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS.

### INDOOR UNITS - \*

MARK NUMBER	FC-1 9 MBH	FC-2 12 MBH	FC-3 18 MBH
SYSTEM	STUDIO	1 BEDROOM	1ST FLOOR LOBBY
TYPE	WALL MOUNTED	WALL MOUNTED	CEILING CASSETTE
EFFICIENCY	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT
NOMINAL COOLING CAPACITY	9,000 BTUH	12,000 BTUH	16,000 BTUH
HEATING CAPACITY	9,000 BTUH	12,000 BTUH	18,000 BTUH
TOTAL SUPPLY CFM	382	380	420
OSA CFM	-	-	0
EXTERNAL SP. (*H2O)	0.25	0.25	0.25
VOLTS/PHASE	-	-	208-1
MCA/MOP	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	-
WEIGHT	25	25	40
BASIS OF DESIGN	CARRIER 40MAHBQ09XA3	CARRIER 40MAHBQ12XA3	CARRIER 40MBC018---3***
OUTDOOR UNIT	HP-1 1/4 TON	HP-2 1 TON	HP-3 1.5 TON

\* - PROVIDE ALL UNITS THAT CANNOT BE DRAINED BY GRAVITY WITH CONDENSATE PUMP, ROUTE ALL CONDENSATE LINES W/ODIN WITHIN STRUCTURE TO AN APPROVED LOCATION PROVIDED BY THE PLUMBER.

Project Title: **NORTHBOUND 30 COLLABORATIVE**  
 Drawing Title: **BUILDING 8 LEVEL 1 MECHANICAL PLAN**

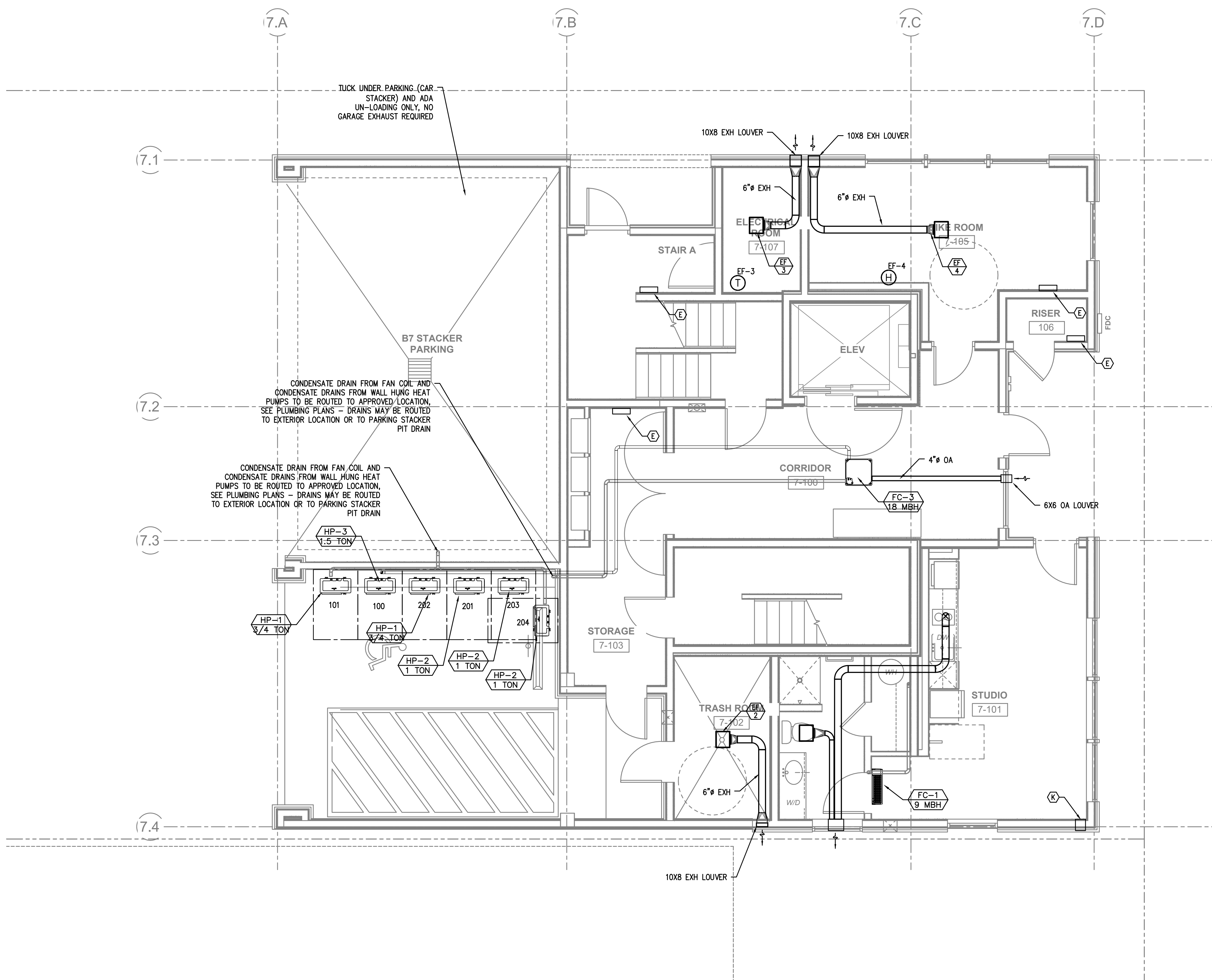
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Date: **06-07-22**

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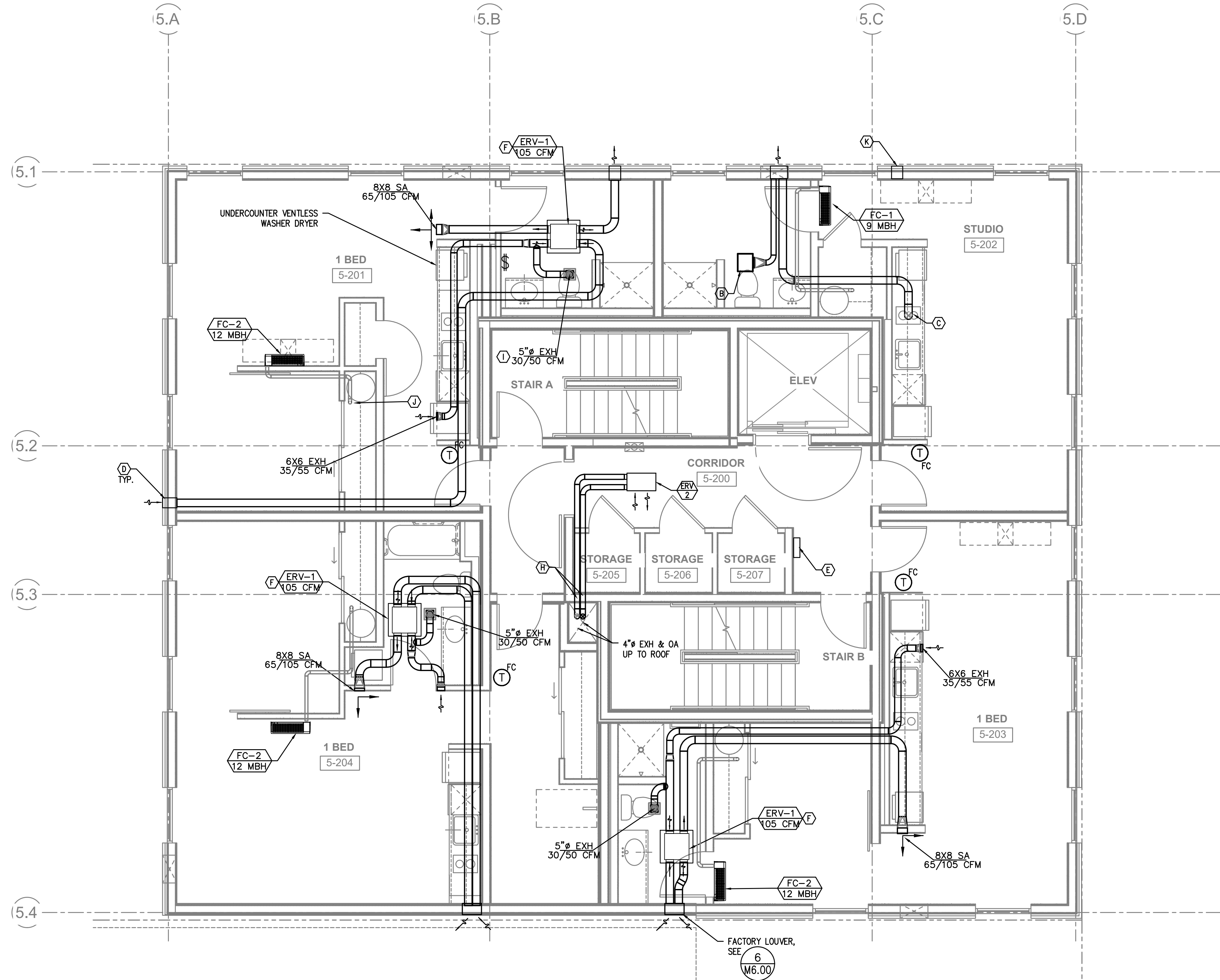
**M7-01.01**



1 BLDG 7 LVL 1 MECHANICAL PLAN  
SCALE: 1/4" = 1'-0"

**KEY NOTES:**

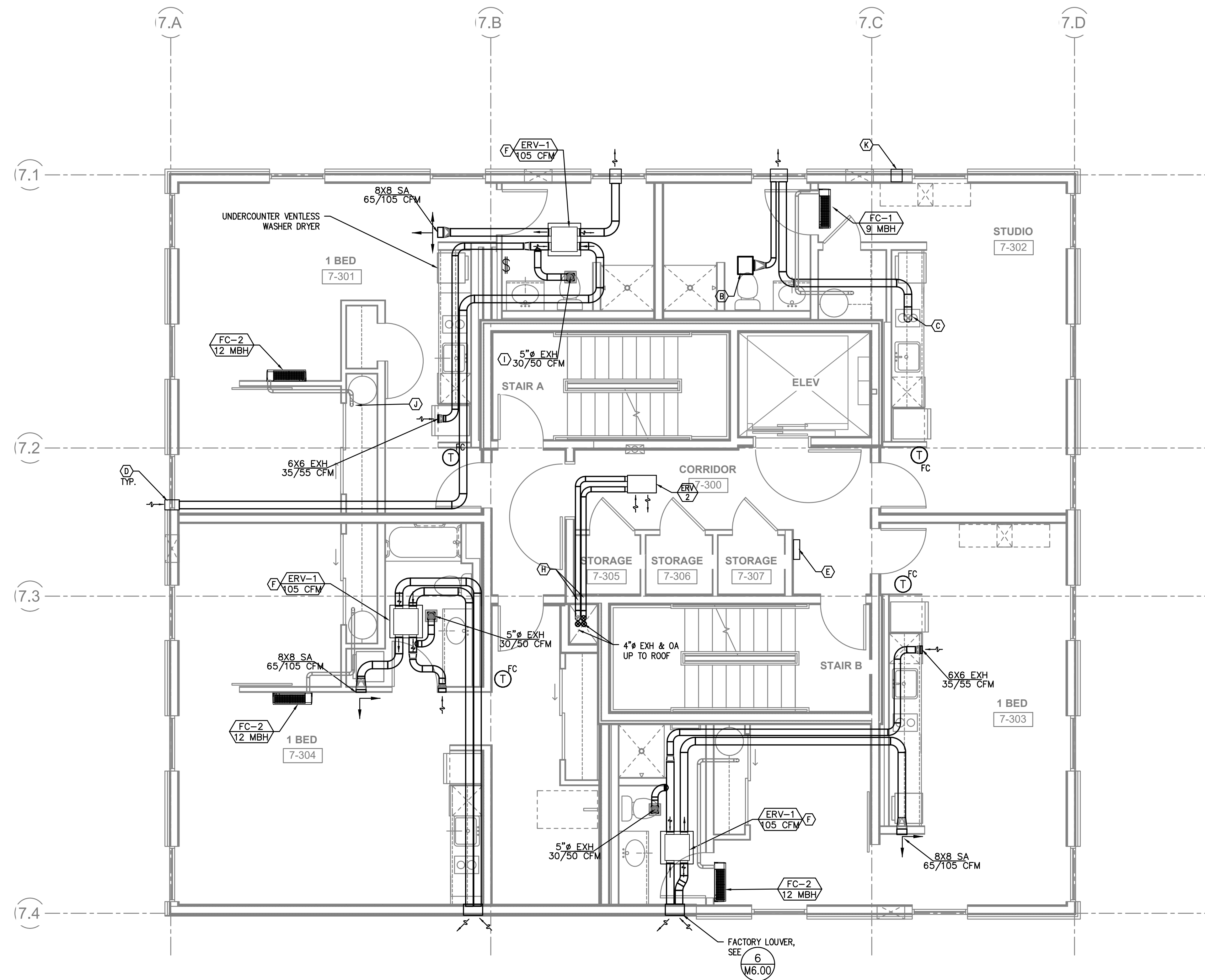
- (A) — REFRIGERANT LINE SETS FROM CONDENSING UNITS ON LEVEL 1/ROOF, TO FAN COILS SEE UNIT NUMBERS AND ROUTING FOR EXACT PLACEMENT. CLT PENETRATION, 3-1/2" HOLE, ALL HOLES SPACED 2" MIN. APART.
- (B) — PANASONIC WHISPERGREEN CEILING FAN WITH 4" DUCT TO ROOF OR EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO FAN, FAN TO OPERATE AT LOW SPEED CONTINUOUS (30CFM) AND INCREASE TO 80CFM WHEN BUILT-IN MOTION SENSOR IS ACTIVATED. INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. SEE (M6.00) (M6.02)
- (C) — 6" HOOD DUCT TO ROOF/EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO HOOD, INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN TO OPERATE INTERMITTENTLY PER 2019 OMSC 505.3 HOOD DUCTS SHALL HAVE SMOOTH INNER WALLS AND SHALL BE AIR TIGHT AND BE EQUIPPED WITH A BACKDRAFT DAMPER.
- (D) — EXTERIOR EXHAUST PLENUM — SEE (M6.01) MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
- (E) — 1.5KW WALL HEATER QMARK AWH4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (F) — ERV DETAILS, SEE (M6.01) 6" OA, 6" EXH, AND 6" SA DUCTS.
- (G) — 1.5KW CADET WALL HEATERS FOR LIVING UNITS, 120V. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (H) — FIRE PENETRATION DETAILS, SEE (M6.00) (5)
- (I) — ERV EXHAUST DUCT, SEE (M6.00) (7)
- (J) — 3/4" CONDENSATE TO WATER HEATER FLOOR DRAIN.
- (K) — FRESH AIR DAMPER FOR DWELLING UNITS < 500SQ FT, SEE (M6.01) (3)



**KEY NOTES:**

- (A) — REFRIGERANT LINE SETS FROM CONDENSING UNITS ON LEVEL 1/ROOF, TO FAN COILS SEE UNIT NUMBERS AND ROUTING FOR EXACT PLACEMENT. CLT PENETRATION, 3-1/2" HOLE, ALL HOLES SPACED 2" MIN. APART.
- (B) — PANASONIC WHISPERGREEN CEILING FAN WITH 4" DUCT TO ROOF OR EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO FAN, FAN TO OPERATE AT LOW SPEED CONTINUOUS (30CFM) AND INCREASE TO 80CFM WHEN BUILT-IN MOTION SENSOR IS ACTIVATED. INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. SEE 1 M6.00 1 M6.02
- (C) — 6" HOOD DUCT TO ROOF/EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO HOOD. INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN TO OPERATE INTERMITTENTLY. PER 2019 OMSC 505.3 HOOD DUCTS SHALL HAVE SMOOTH INNER WALLS AND SHALL BE AIR TIGHT AND BE EQUIPPED WITH A BACKDRAFT DAMPER.
- (D) — EXTERIOR EXHAUST PLENUM — SEE 2 M6.01 MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
- (E) — 1.5KW WALL HEATER QMARK AWH4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (F) — ERV DETAILS, SEE 1 M6.01 6" OA, 6" EXH, AND 6" SA DUCTS.
- (G) — 1.5KW CADET WALL HEATERS FOR LIVING UNITS, 120V. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (H) — FIRE PENETRATION DETAILS, SEE 5 M6.00
- (I) — ERV EXHAUST DUCT, SEE 7 M6.00
- (J) — 3/4" CONDENSATE TO WATER HEATER FLOOR DRAIN.
- (K) — FRESH AIR DAMPER FOR DWELLING UNITS < 500SQ FT, SEE 3 M6.01

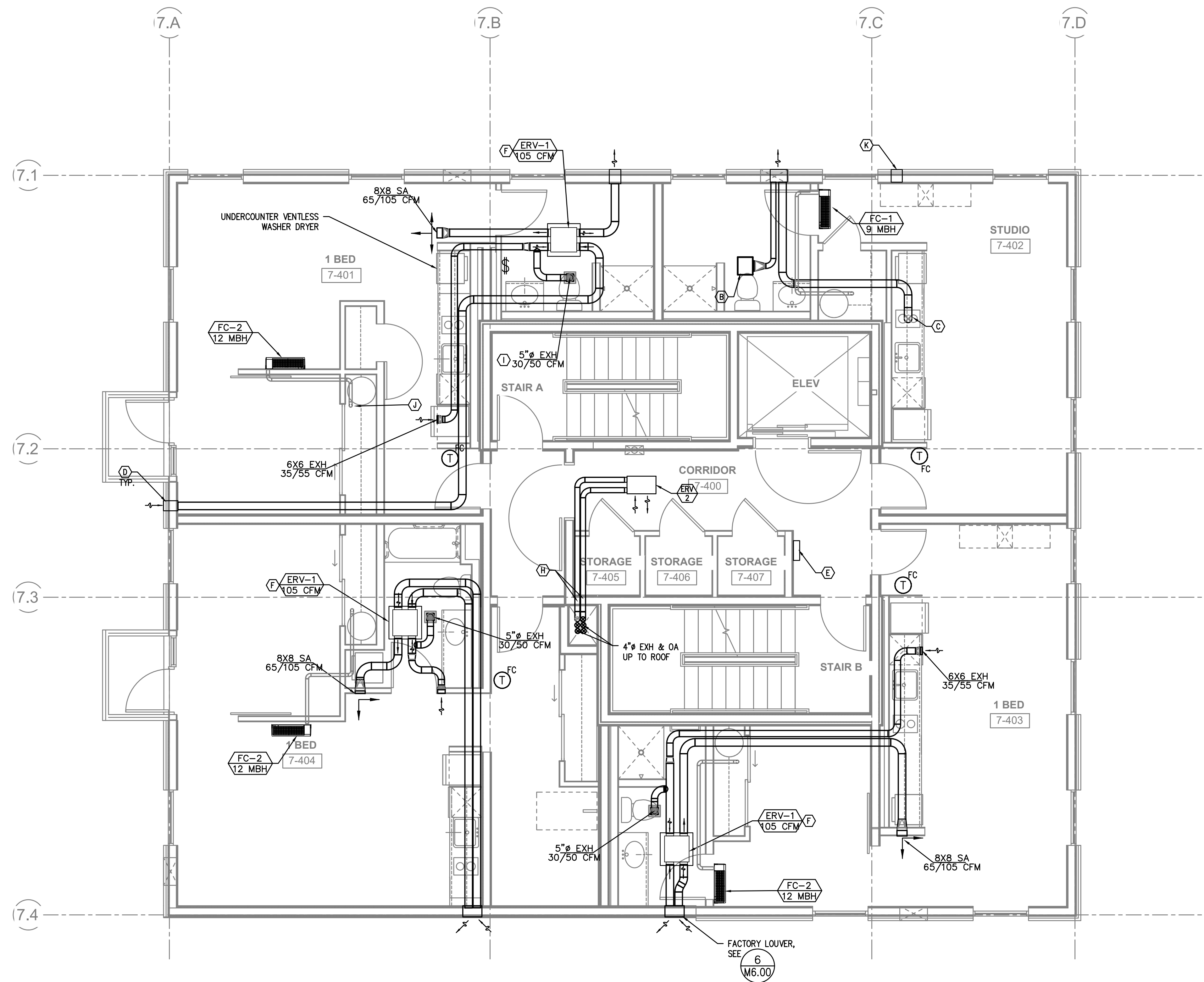
1 BLDG 7 LVL 2 MECHANICAL PLAN  
M3.02 SCALE: 1/4" = 1'-0"



**KEY NOTES:**

- (A) — REFRIGERANT LINE SETS FROM CONDENSING UNITS ON LEVEL 1/ROOF, TO FAN COILS SEE UNIT NUMBERS AND ROUTING FOR EXACT PLACEMENT. CLT PENETRATION, 3-1/2" HOLE, ALL HOLES SPACED 2" MIN. APART.
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- (H) — FIRE PENETRATION DETAILS, SEE 5 M6.00
- (I) — ERV EXHAUST DUCT, SEE 7 M6.00
- (J) — 3/4" CONDENSATE TO WATER HEATER FLOOR DRAIN.
- (K) — FRESH AIR DAMPER FOR DWELLING UNITS< 500SQ FT, SEE 3 M6.01

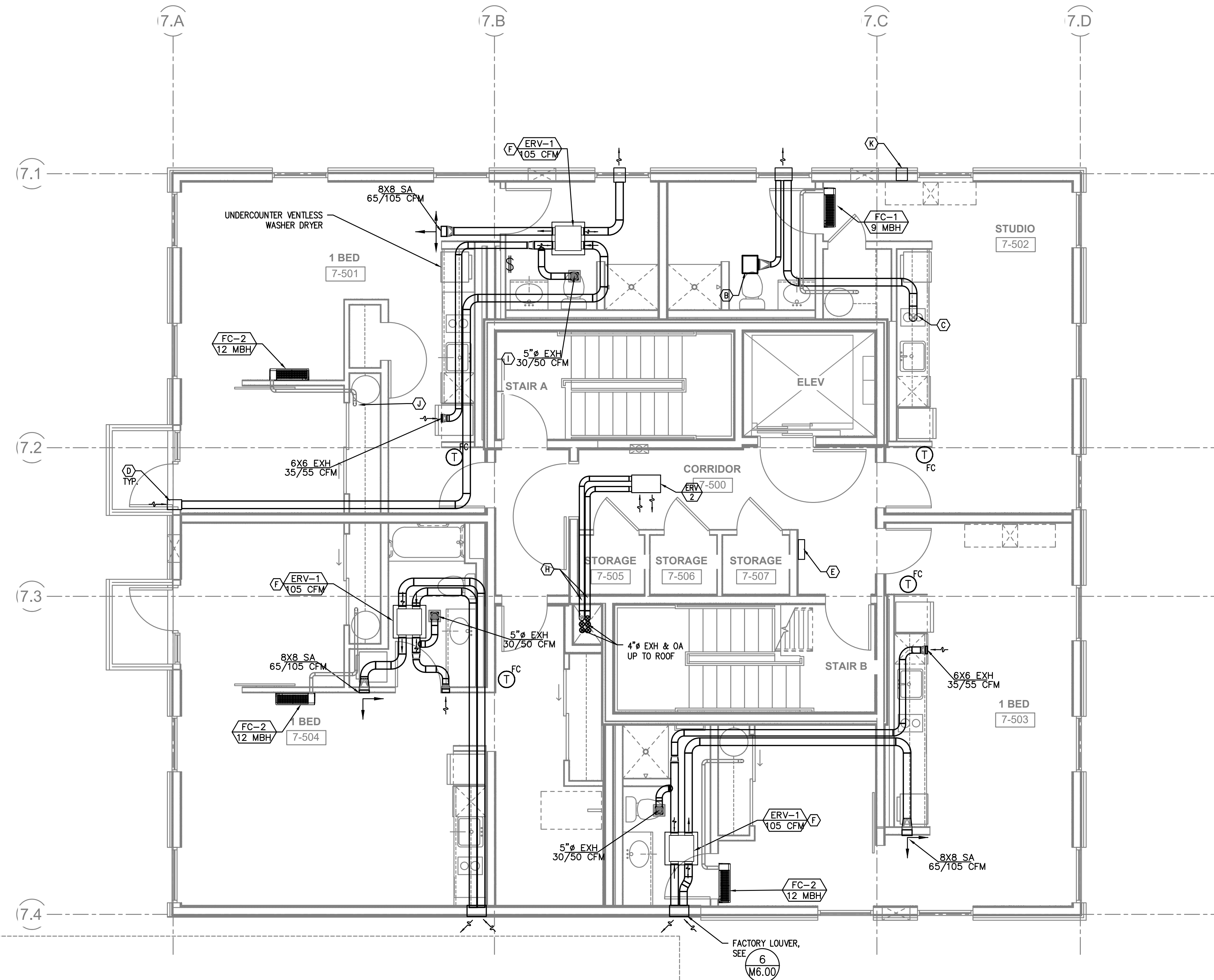
1 BLDG 7 LVL 3 MECHANICAL PLAN  
M3.03 SCALE: 1/4" = 1'-0"



**KEY NOTES:**

- (A) — REFRIGERANT LINE SETS FROM CONDENSING UNITS ON LEVEL 1/ROOF, TO FAN COILS SEE UNIT NUMBERS AND ROUTING FOR EXACT PLACEMENT. CLT PENETRATION, 3-1/2" HOLE, ALL HOLES SPACED 2" MIN. APART.
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- (C) — 6" HOOD DUCT TO ROOF/EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO HOOD, INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN TO OPERATE INTERMITTENTLY PER 2019 OMSC 505.3 HOOD DUCTS SHALL HAVE SMOOTH INNER WALLS AND SHALL BE AIR TIGHT AND BE EQUIPPED WITH A BACKDRAFT DAMPER.
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- (E) — 1.5KW WALL HEATER QMARK AWH4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (F) — ERV DETAILS, SEE 1 M6.01 6" OA, 6" EXH, AND 6" SA DUCTS.
- (G) — 1.5KW CADET WALL HEATERS FOR LIVING UNITS, 120V. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (H) — FIRE PENETRATION DETAILS, SEE 5 M6.00
- (I) — ERV EXHAUST DUCT, SEE 7 M6.00
- (J) — 3/4" CONDENSATE TO WATER HEATER FLOOR DRAIN.
- (K) — FRESH AIR DAMPER FOR DWELLING UNITS < 500SQ FT, SEE 3 M6.01

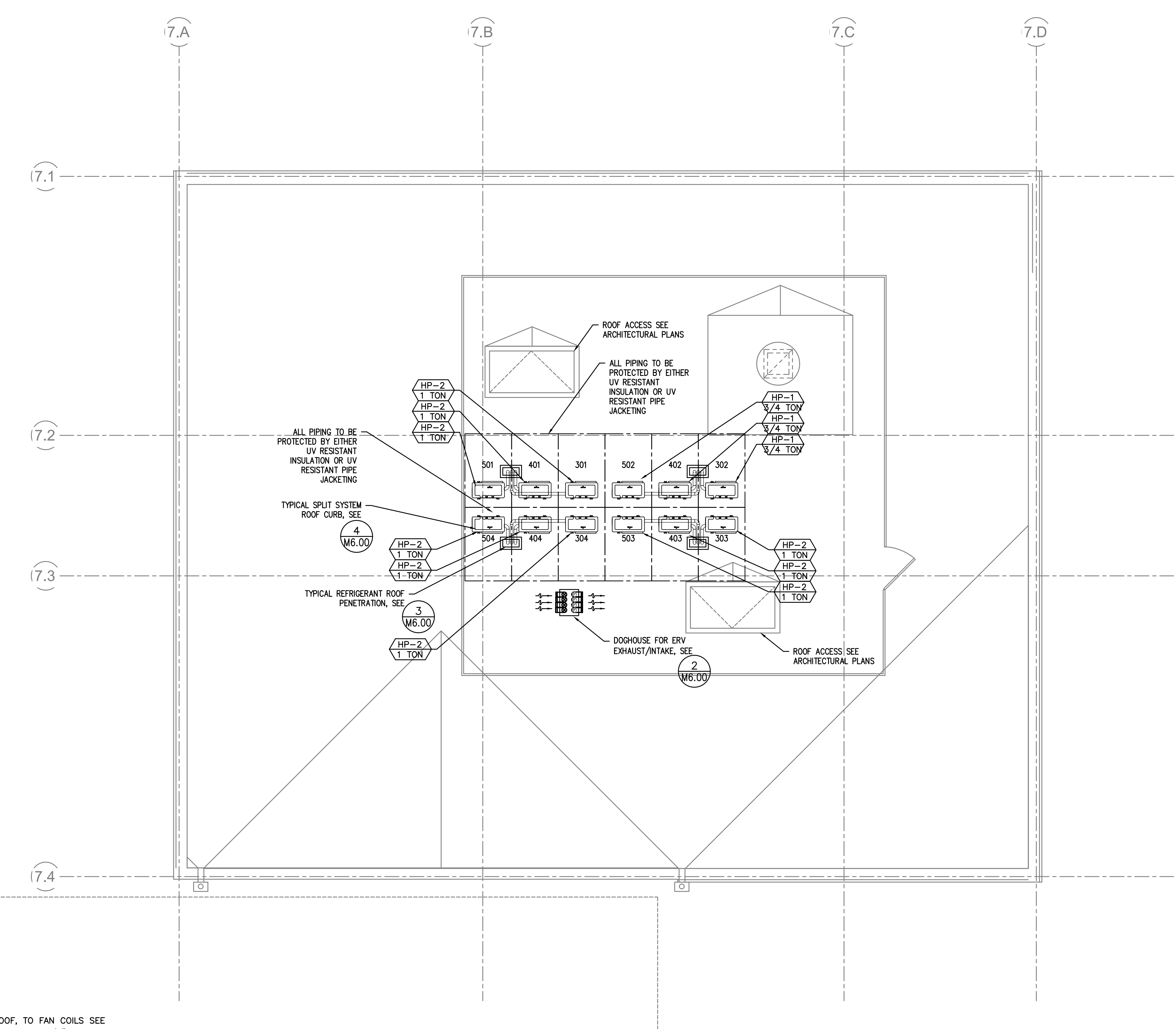
1 BLDG 7 LVL 4 MECHANICAL PLAN  
M3.04 SCALE: 1/4" = 1'-0"



1 BLDG 7 LVL 5 MECHANICAL PLAN  
 M3.05 SCALE: 1/4" = 1'-0"

**KEY NOTES:**

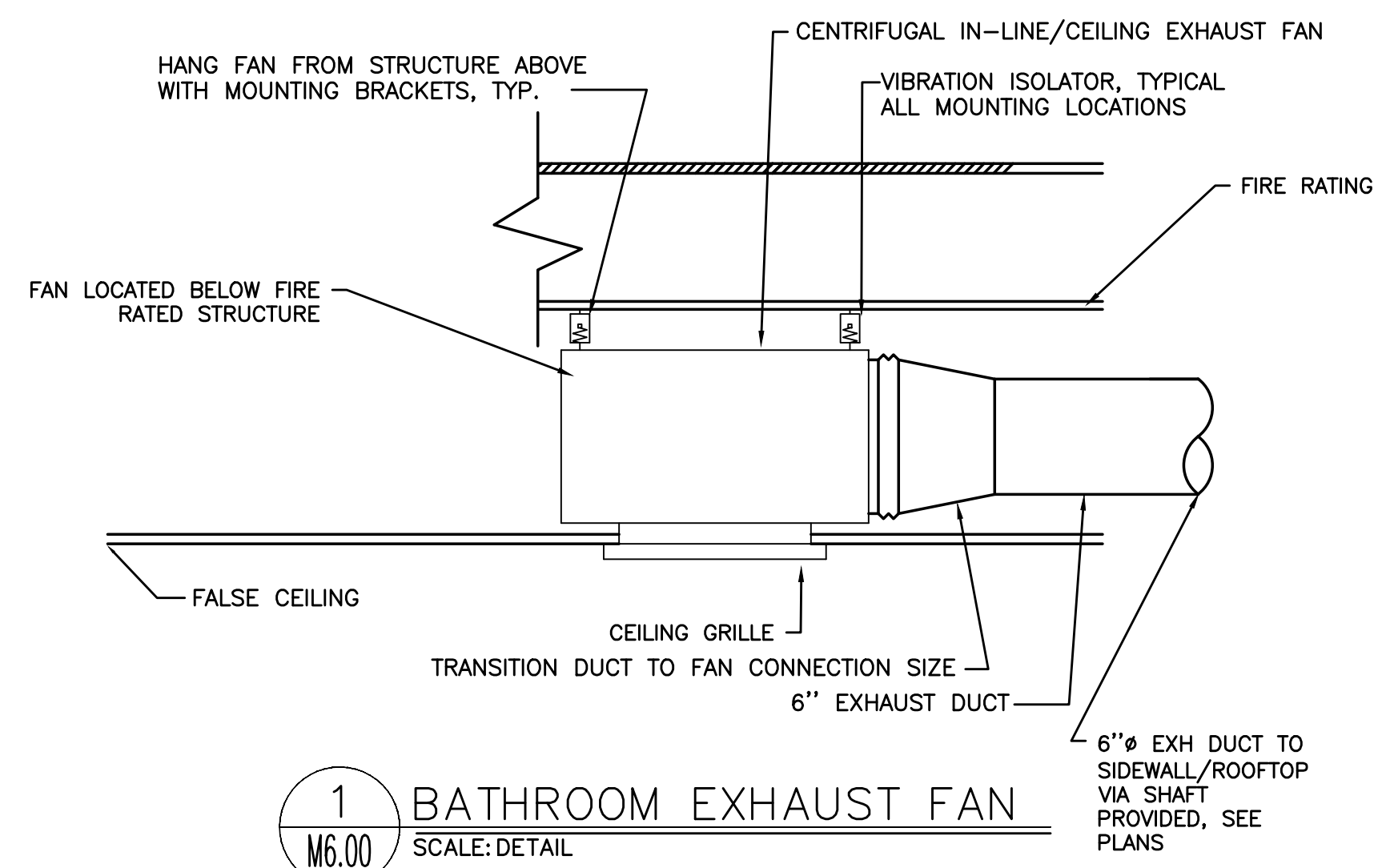
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- (C) — 6" HOOD DUCT TO ROOF/EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO HOOD, INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN TO OPERATE INTERMITTENTLY PER 2019 OMSC 505.3 HOOD DUCTS SHALL HAVE SMOOTH INNER WALLS AND SHALL BE AIR TIGHT AND BE EQUIPPED WITH A BACKDRAFT DAMPER.
- (D) — EXTERIOR EXHAUST PLENUM — SEE (2) M6.01 MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
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- (F) — ERV DETAILS, SEE (1) M6.01 6" OA, 6" EXH, AND 6" SA DUCTS.
- (G) — 1.5KW CADET WALL HEATERS FOR LIVING UNITS, 120V. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
- (H) — FIRE PENETRATION DETAILS, SEE (5) M6.00
- (I) — ERV EXHAUST DUCT, SEE (7) M6.00
- (J) — 3/4" CONDENSATE TO WATER HEATER FLOOR DRAIN.
- (K) — FRESH AIR DAMPER FOR DWELLING UNITS < 500SQ FT, SEE (3) M6.01



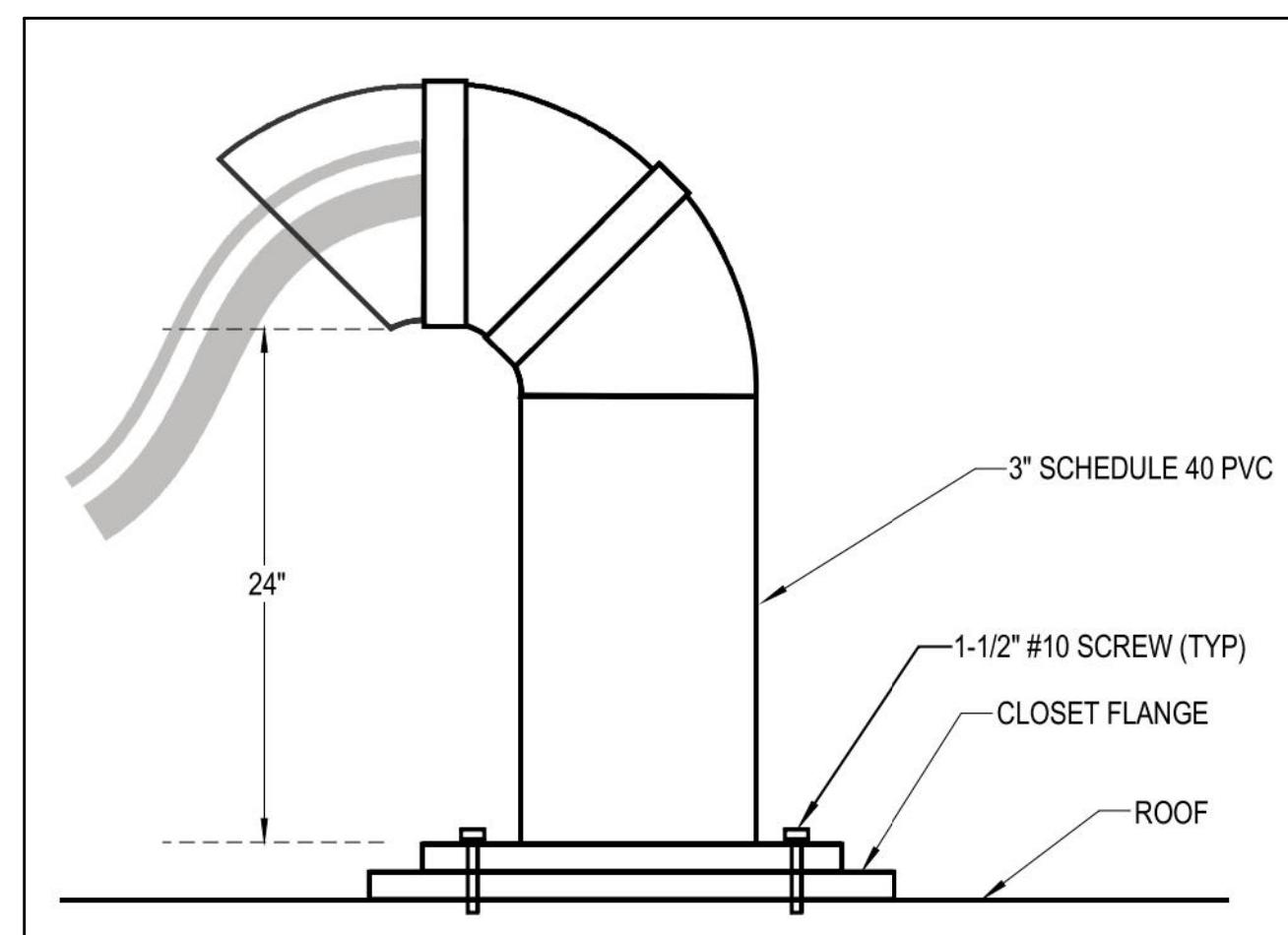
**1 BLDG 7 ROOF MECHANICAL PLAN**  
 M3.06 SCALE: 1/4" = 1'-0"

**KEY NOTES:**

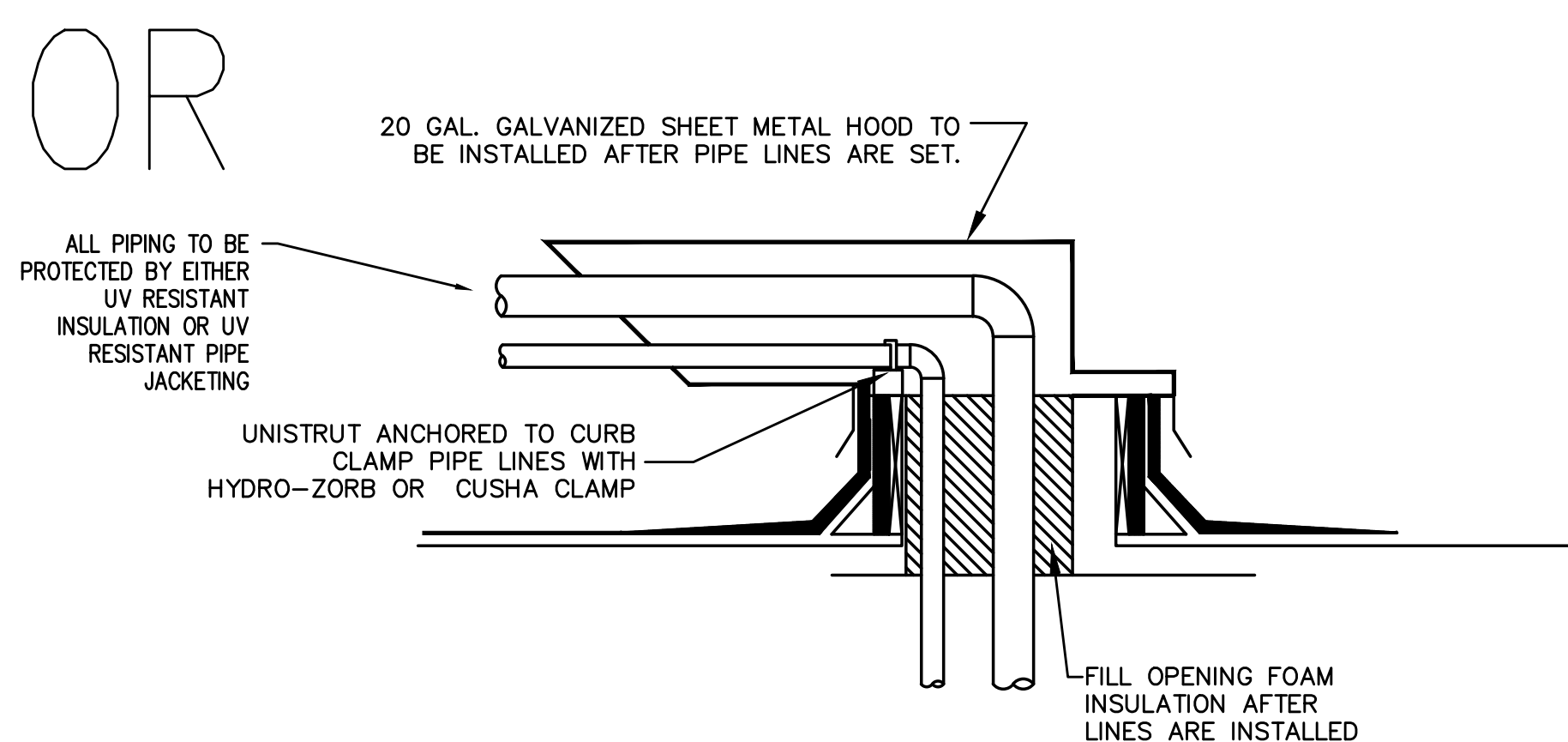
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- (C) — 6" HOOD DUCT TO ROOF/EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO HOOD, INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN TO OPERATE INTERMITTENTLY PER 2019 OMSC 505.3 HOOD DUCTS SHALL HAVE SMOOTH INNER WALLS AND SHALL BE AIR TIGHT AND BE EQUIPPED WITH A BACKDRAFT DAMPER.
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- (H) — FIRE PENETRATION DETAILS, SEE **5 M6.00**
- (I) — ERV EXHAUST DUCT, SEE **7 M6.00**
- (J) — 3/4" CONDENSATE TO WATER HEATER FLOOR DRAIN.
- (K) — FRESH AIR DAMPER FOR DWELLING UNITS < 500SQ FT, SEE **3 M6.01**



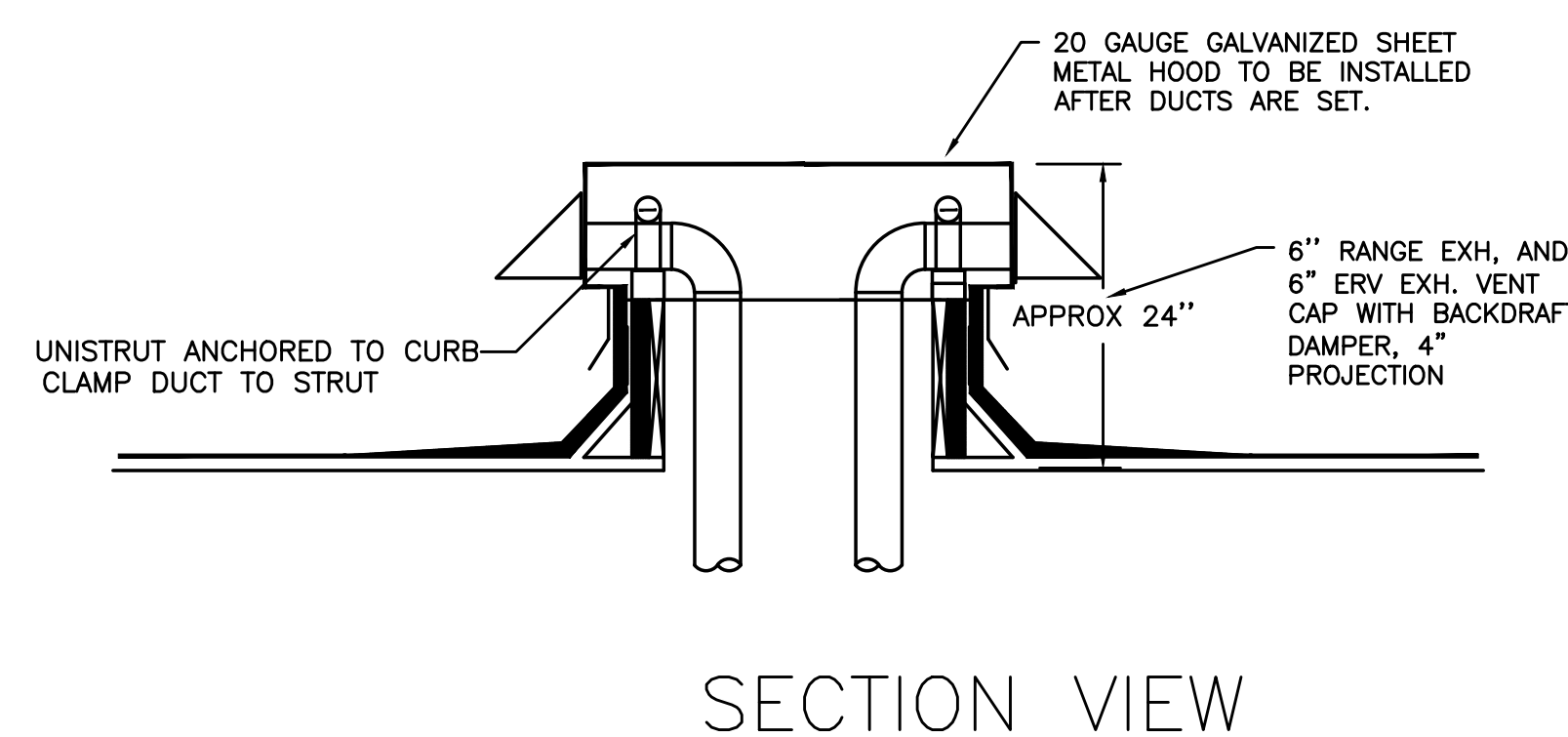
1 BATHROOM EXHAUST FAN  
SCALE: DETAIL  
M6.00



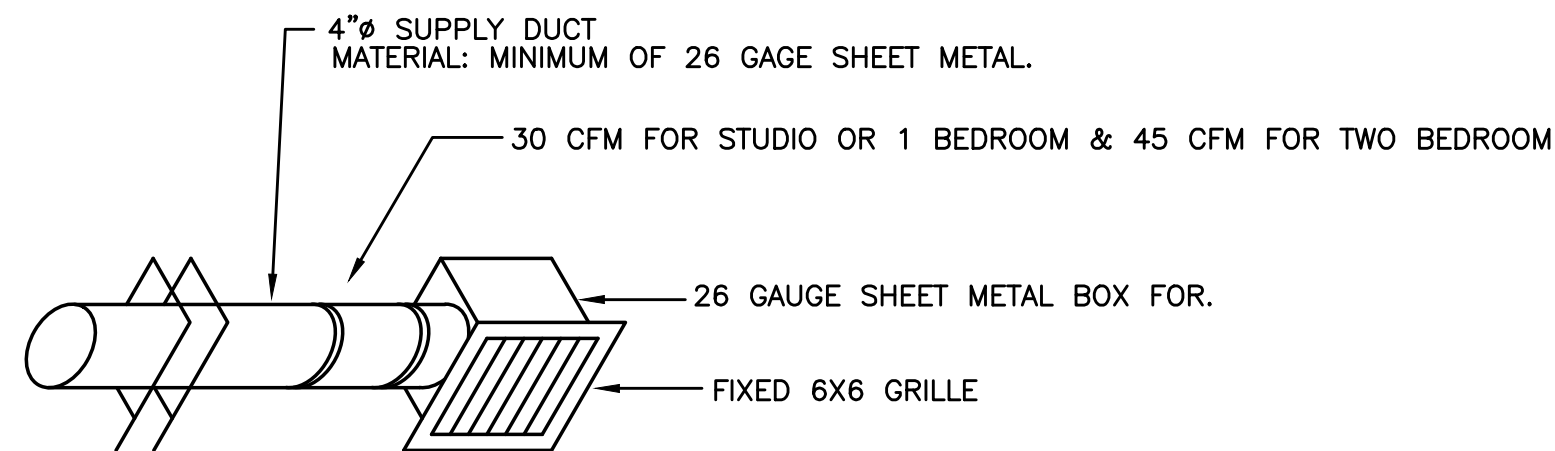
2 TYPICAL ROOFTOP OUTLET HOOD  
NOT TO SCALE  
M6.00



3 REFRIGERANT ROOF PENETRATIONS  
DETAIL  
M6.00

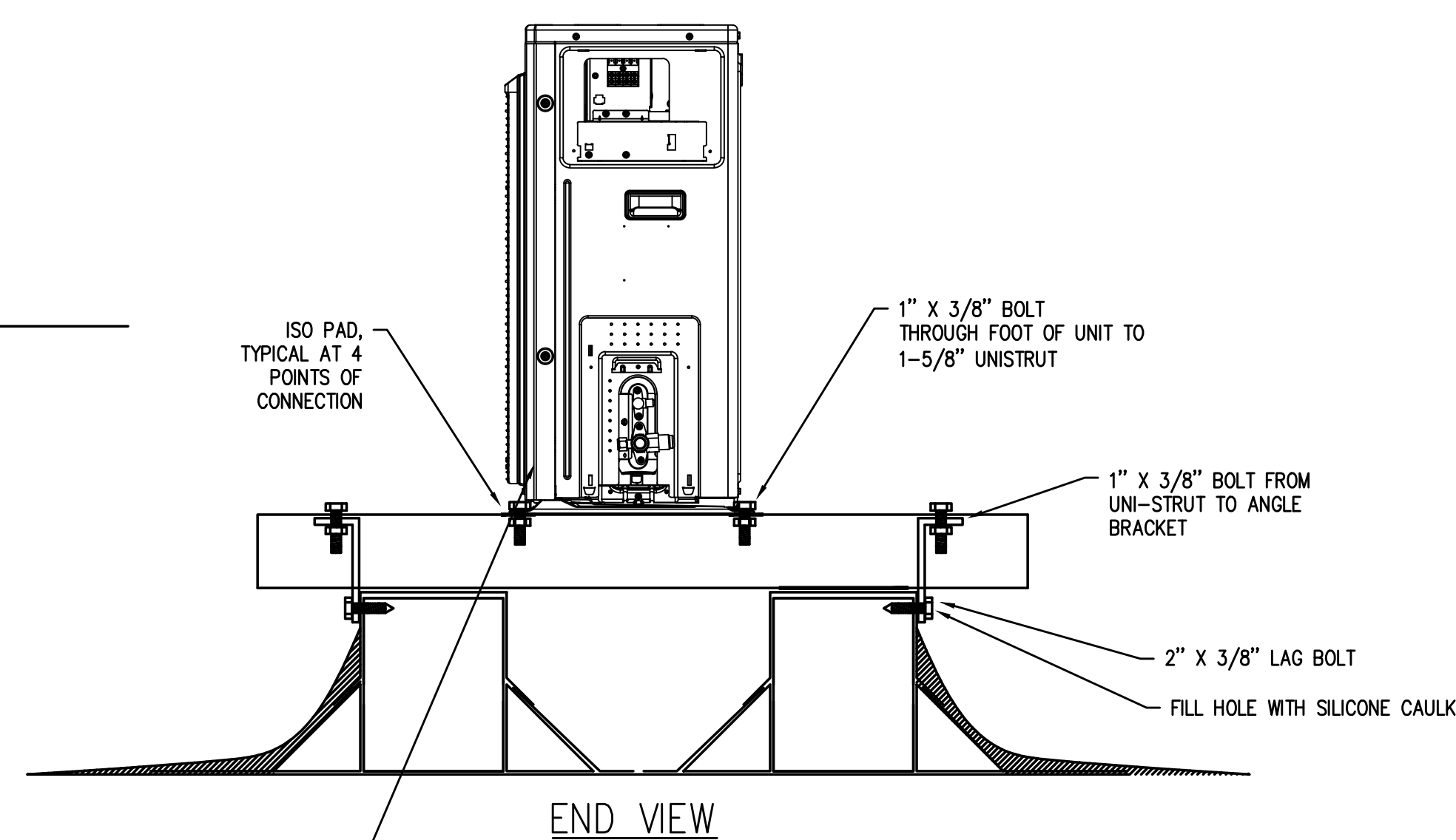


4 HEAT PUMP CURB  
DETAIL  
M6.00

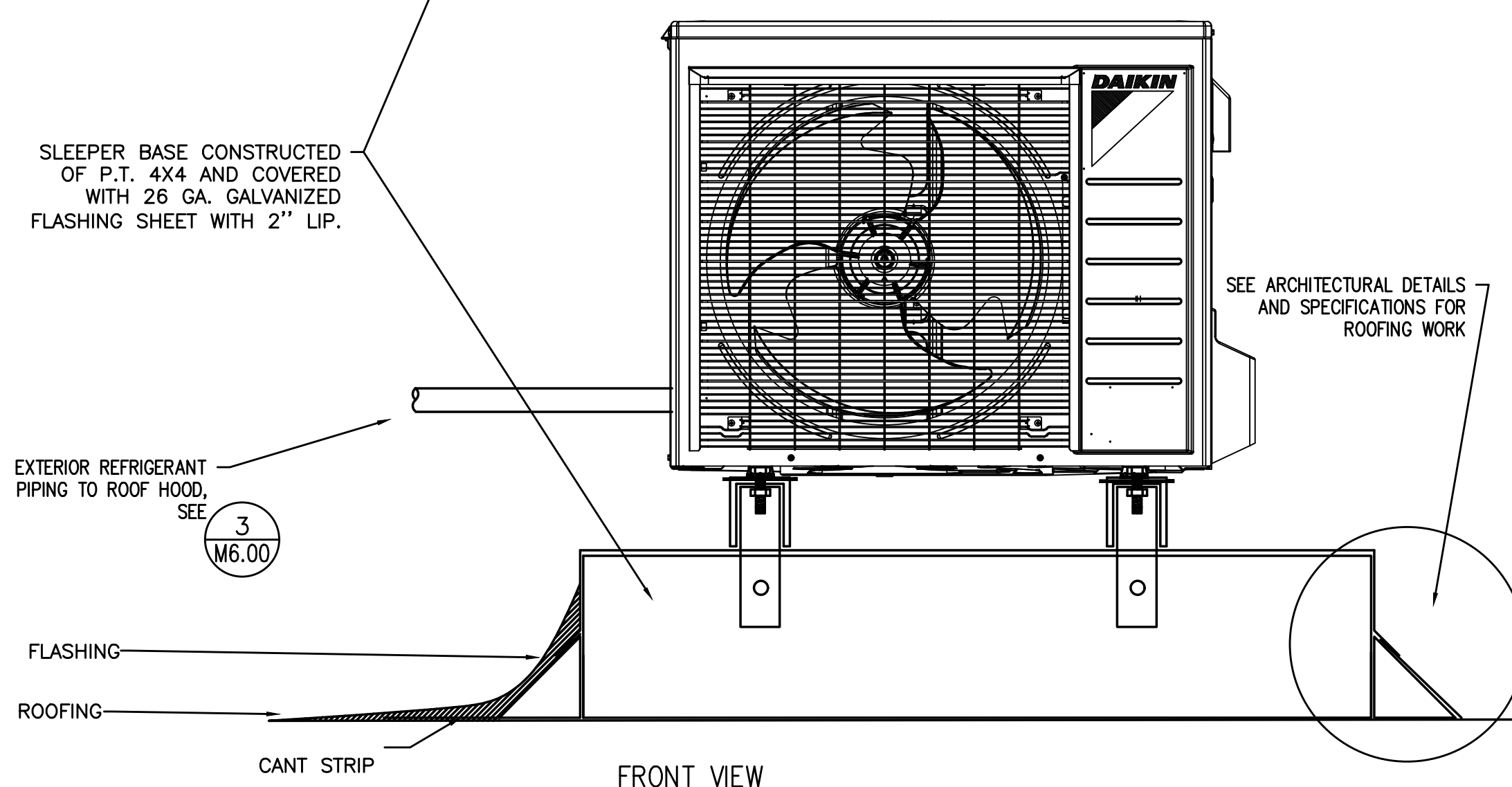


5 FIRE PENETRATION DETAIL - 5\"/>

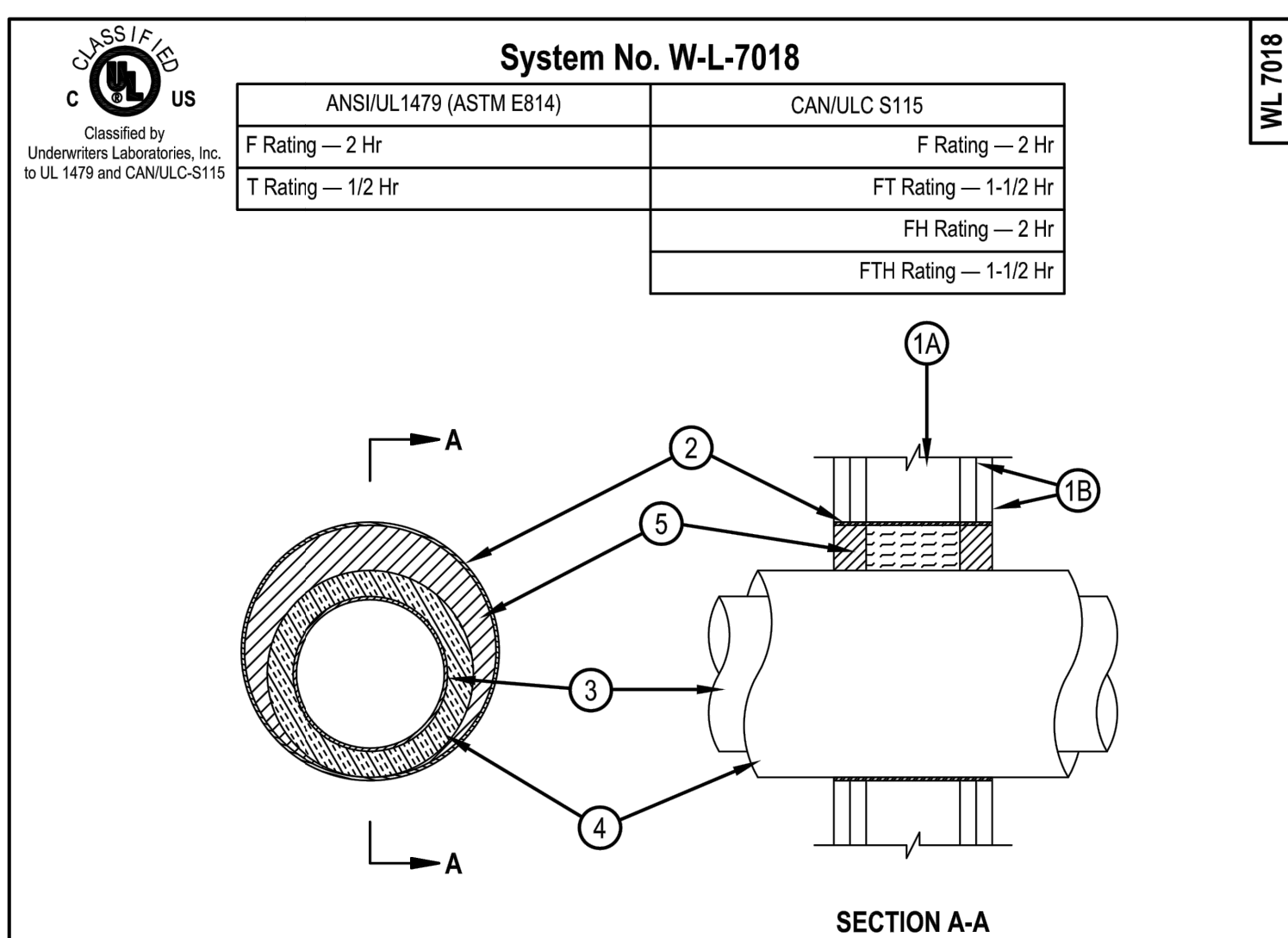
7 CONSTANT AIR REGULATOR (CAR) - CEILING  
NOT TO SCALE  
M6.00



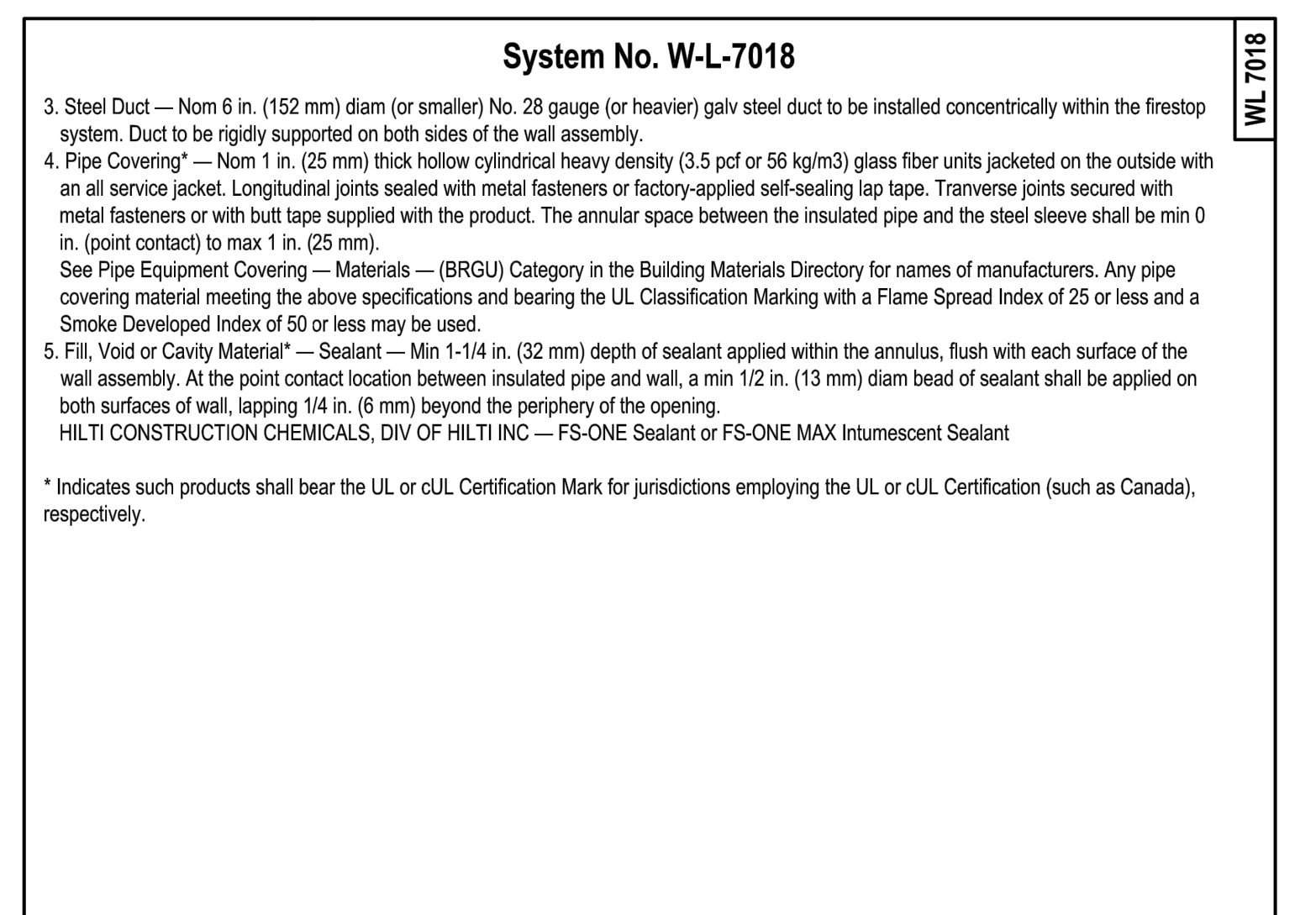
6 ERV INTAKE/EXHAUST TERMINATION  
DETAIL  
M6.00



3 REFRIGERANT ROOF PENETRATIONS  
DETAIL  
M6.00



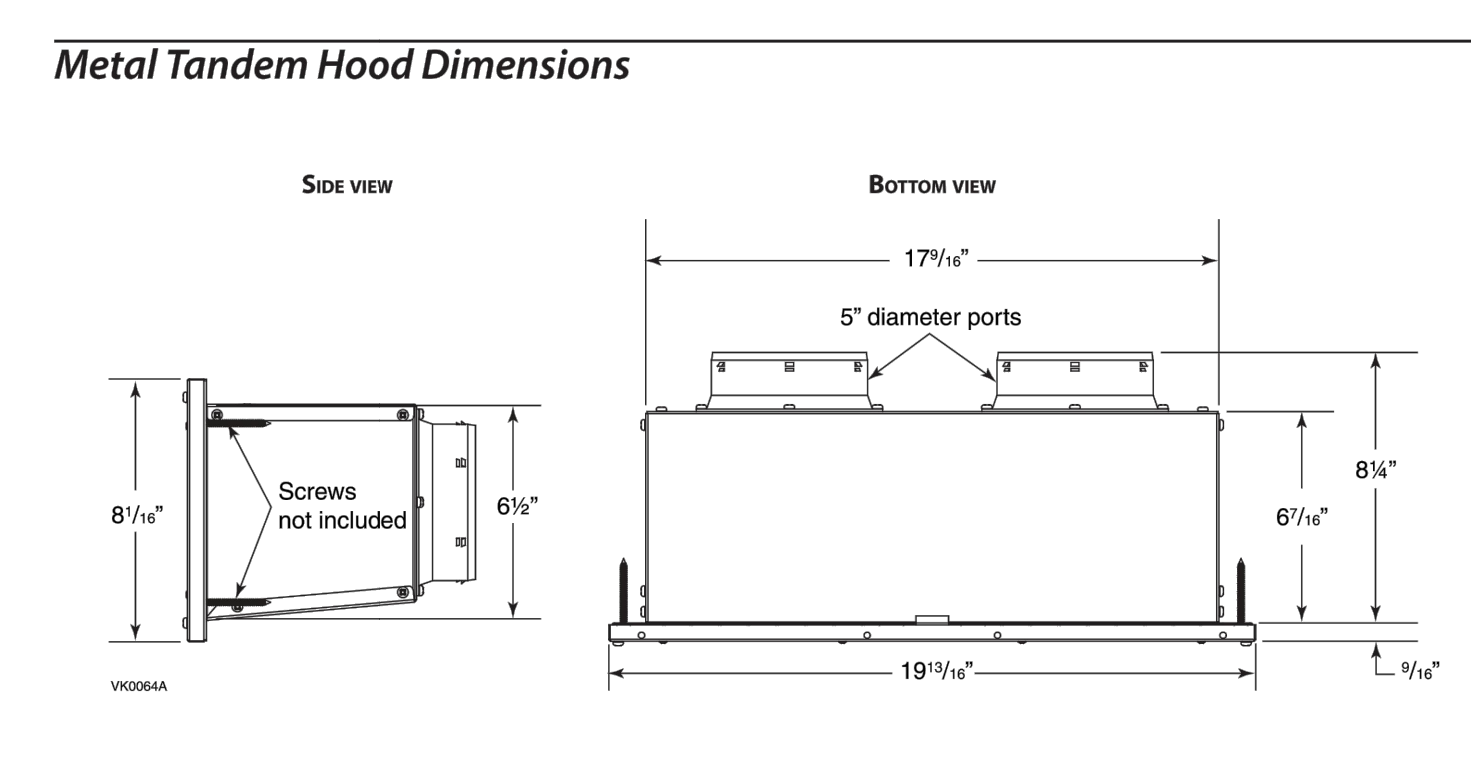
5 FIRE PENETRATION DETAIL - 5\"/>



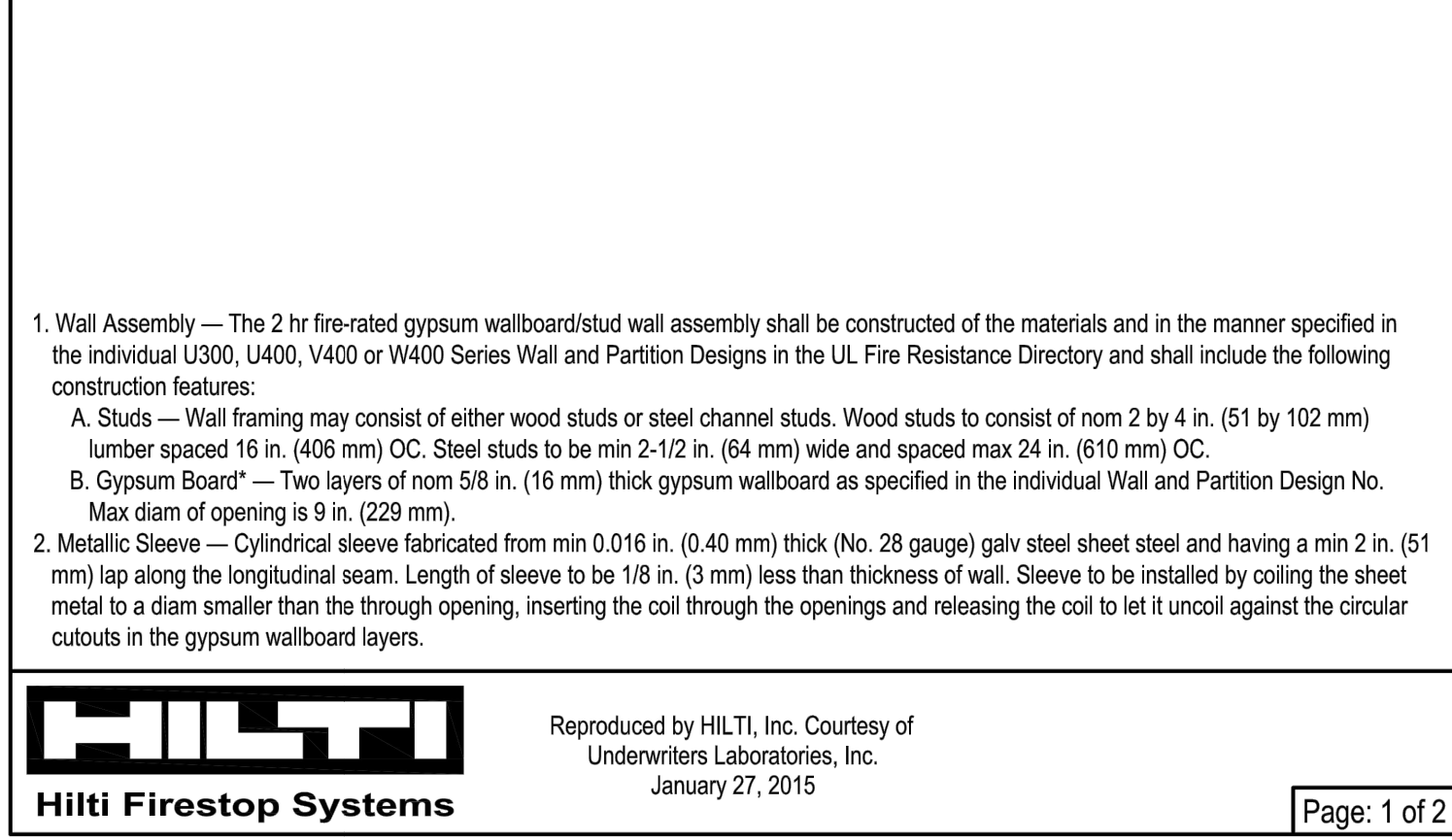
7 CONSTANT AIR REGULATOR (CAR) - CEILING  
NOT TO SCALE  
M6.00



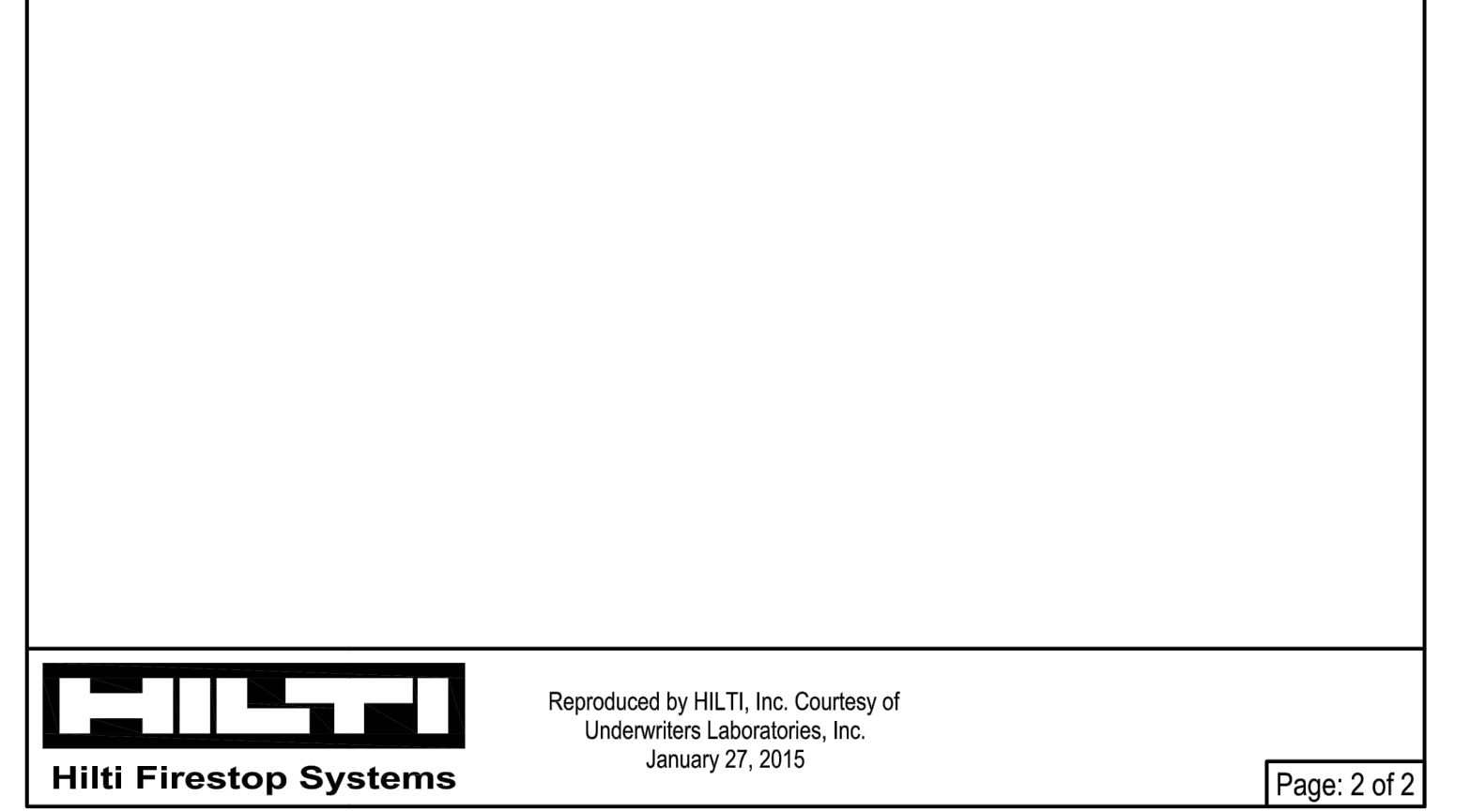
6 ERV INTAKE/EXHAUST TERMINATION  
DETAIL  
M6.00



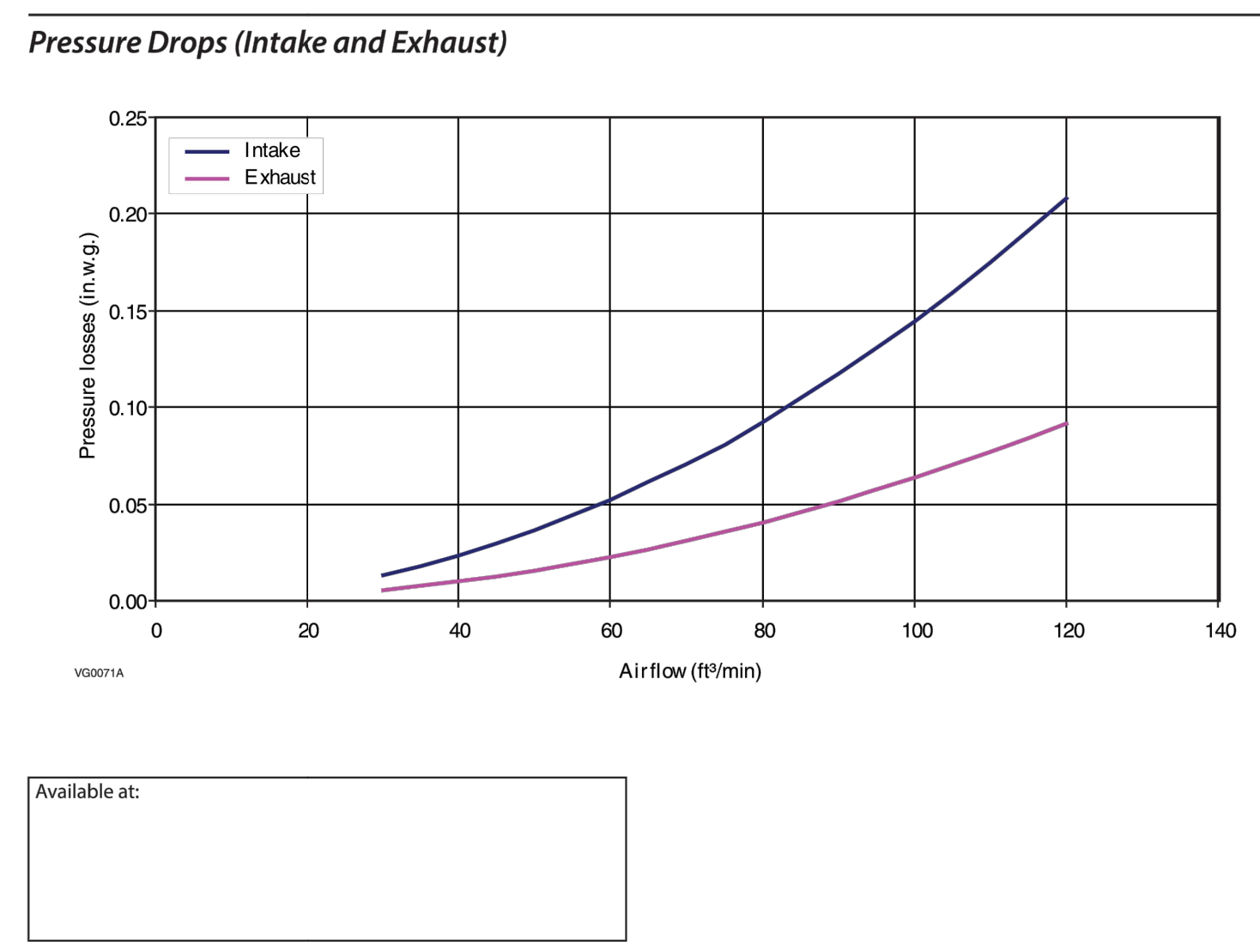
4 HEAT PUMP CURB  
DETAIL  
M6.00



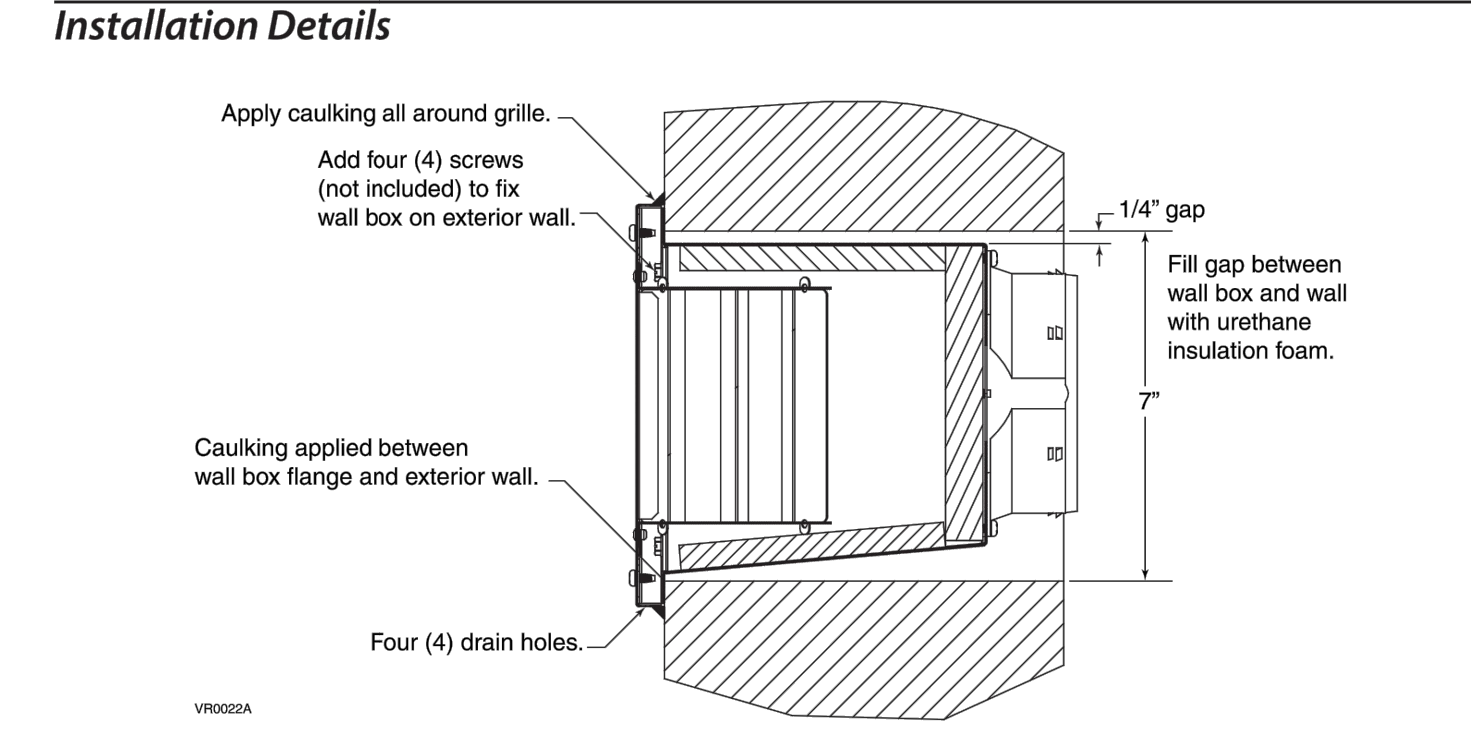
5 FIRE PENETRATION DETAIL - 5\"/>



7 CONSTANT AIR REGULATOR (CAR) - CEILING  
NOT TO SCALE  
M6.00



6 ERV INTAKE/EXHAUST TERMINATION  
DETAIL  
M6.00



4 HEAT PUMP CURB  
DETAIL  
M6.00



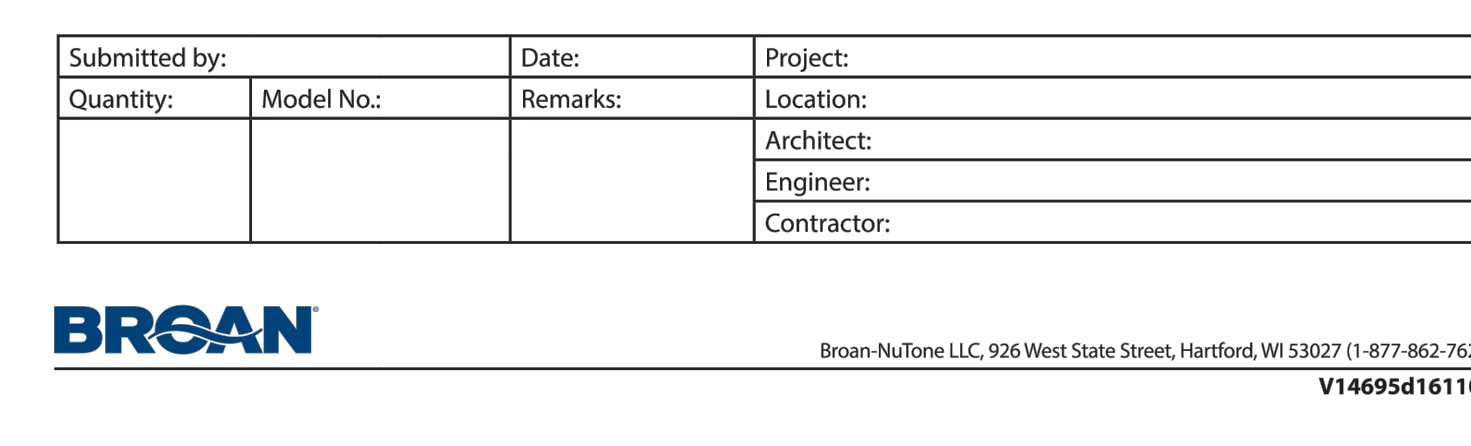
5 FIRE PENETRATION DETAIL - 5\"/>



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NOT TO SCALE  
M6.00



6 ERV INTAKE/EXHAUST TERMINATION  
DETAIL  
M6.00



4 HEAT PUMP CURB  
DETAIL  
M6.00

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FAX: (503) 234-2907  
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Project Title:  
NORTHBOUND 30 COLLABORATIVE  
NW 29TH AVE PORTLAND, OREGON 97210

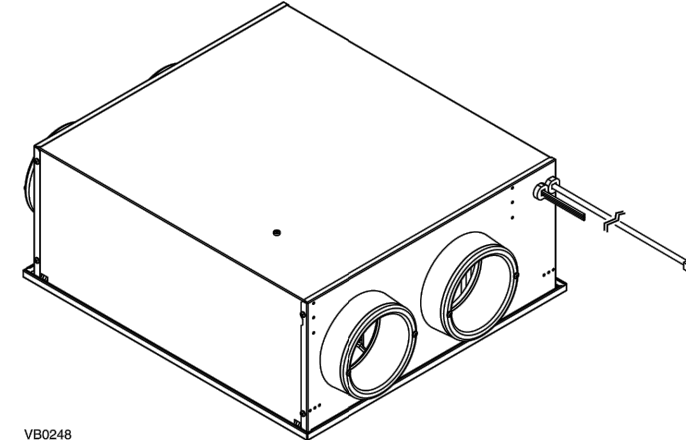
Submitted by:	Date:	Project:
Quantity:	Model No.:	Location:
Remarks:	Architect:	Engineer:
	Contractor:	

MECHANICAL DETAILS  
M7-6.00





**BROAN™ ERVS100**  
Part no. ERVS100S  
65-105 CFM (0.4 in. w.g.)



**Product balancing**

The ERVS100 is equipped with 2 high static pressure blowers and is factory balanced. Once installed, the ERVS100 will remain balanced (within a 10% total difference between the exhaust and supply airflow) when the static pressure difference between the exhaust and the supply remains below 0.2 in. w.g. No balancing dampers are required when this condition is met.

**Filters**

- 2 washable filters, 20 PPI
- MERV 8 optional filters, part V21030.

**Defrosting system**

Unit performs a negative defrost during 10 minutes every 20 minutes when outdoor temperature is below 14°F, and 10 minutes every 10 minutes below -4°F.

**Energy Recovery Core**

Material: Polymerized paper  
Type: Cross flow  
Warranty: 5 years

**Options**

- Broan VTYIK1 Tandem transition (requires an additional backdraft damper, not included)
- Broan VB20W 20-minute push-button control
- Broan 69V Single-Function Control, Ivory (Dry contact standby switch)
- Broan 69W Single-Function Control, White (Dry contact standby switch)
- Broan 634M black exhaust roof cap 6" with backdraft damper and bird screen
- Broan 641 aluminum exhaust wall cap 6"
- Broan 641FA aluminum inlet wall cap 6" with bird screen
- Broan CV6 interior inlet plastic grille 6"
- Broan CVL6 mounting sleeve for inlet grille CV6G
- Broan CVLD6 sleeve with 6" backdraft damper

**Requirements and standards**

- Complies with the UL 1812 requirements regulating the installation of Energy Recovery Ventilators;
- HVI certified;
- Airflow and energy recovery performance tested in accordance with CSA C439 standard.

**THE FRESH AIR SOLUTION FOR SOUTHERN REGIONS**

The Broan ERVS100 is an effective, balanced ventilation solution designed specifically for homes in southern regions. The ERVS100 provides a continuous supply of fresh air to the home while exhausting stale air and pollutants. Plus it manages excess moisture - making it a centerpiece for tightly-constructed, energy efficient homes in hot and humid or dry climates.

- 65 to 105 CFM at 0.4 in. w.g.
- Energy recovery core recovering up to 51% of the excess moisture and up to 71% of the apparent heat or coolness;
- Built-in humidity sensor limiting the ventilation during periods of excessive outdoor humidity levels contributes to maintain a comfortable living area and mitigate the risks of mold growth;
- Exclusive bracket system providing a faster and easier installation in the ceiling, an attic or in a closet. See the installation and User guide for more details.
- Integrates with existing forced-air furnace ducting for easy installation but runs independently to limit energy consumption related to ventilation;
- Built-in damper on fresh air supply port to prevent outdoor air infiltration when the unit is turned off;
- Integrated control to easily set the unit at installation.

**REPAIRS AND MAINTENANCE**

All parts requiring maintenance can be removed in less than 5 minutes allowing easy access for repairs. The PSC motors are permanently lubricated.

**WARRANTY**

The BROAN™ ERVS100 is protected by a 5-year warranty on parts only. The energy recovery core is covered by a 5-year warranty, with the original proof of purchase.

**Noise level**

0.4 sone @ 105 cfm at grille with 5' of flexible ducting (tested in accordance with ISO 5136 and HVI 915).

**Specifications**

Model: Broan ERVS100  
Part number: ERVS100S

Total assembled weight including packaging: 40 lb.  
Insulated round ports: 6" diameter

Built-in magnetic backdraft damper to close outdoor fresh air supply when the unit is turned off

Energy recovery core:

- Type cross flow
- Media membrane: Polymerized paper with aluminum

Core filters: 2 washable filters, 20 PPI

Optional MERV 8 filter kit, part no. V21030

Housing material: galvanized steel 22 ga

Door and door frame material: White pre-painted steel 20 ga

Insulation material: Molded Expanded polystyrene, UL certified for Energy recovery ventilators requirements

Supply and exhaust blower motors:

- PSC motors
- Protection type: Thermally protected
- Lock rotor electronic detection stops unit if motors failed

Installation brackets: included with the unit, allow attic, flush to ceiling and under-ceiling installations. Unit must be installed with the door facing upward or downward. No vertical installation allowed.

**Unit electrical characteristics**

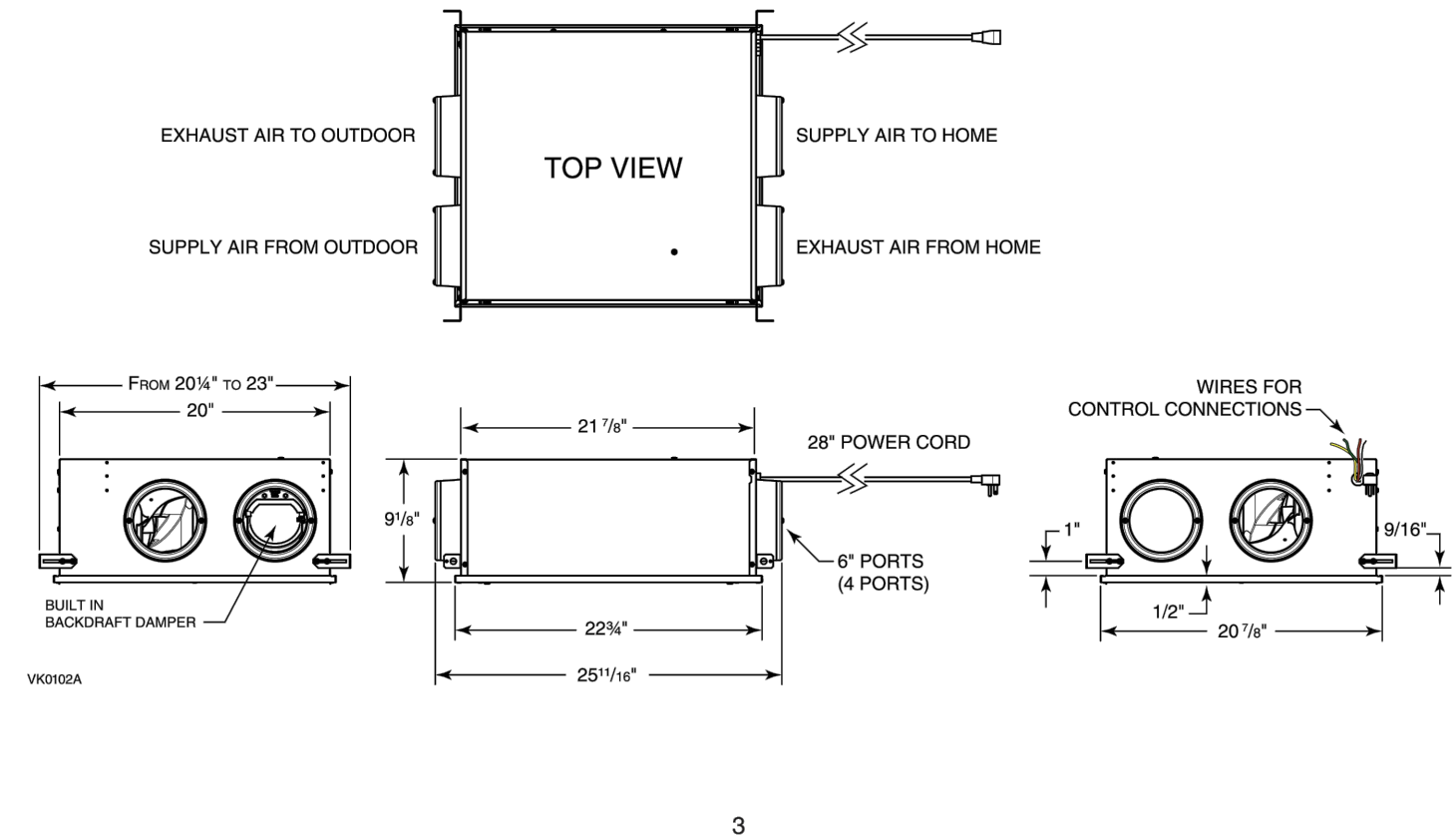
-Power cord 28" with 3-prong plug

Volts Frequency Ampere Watts

120 60 hz 0.9 103

Low voltage connections for optional controls energized by 5V

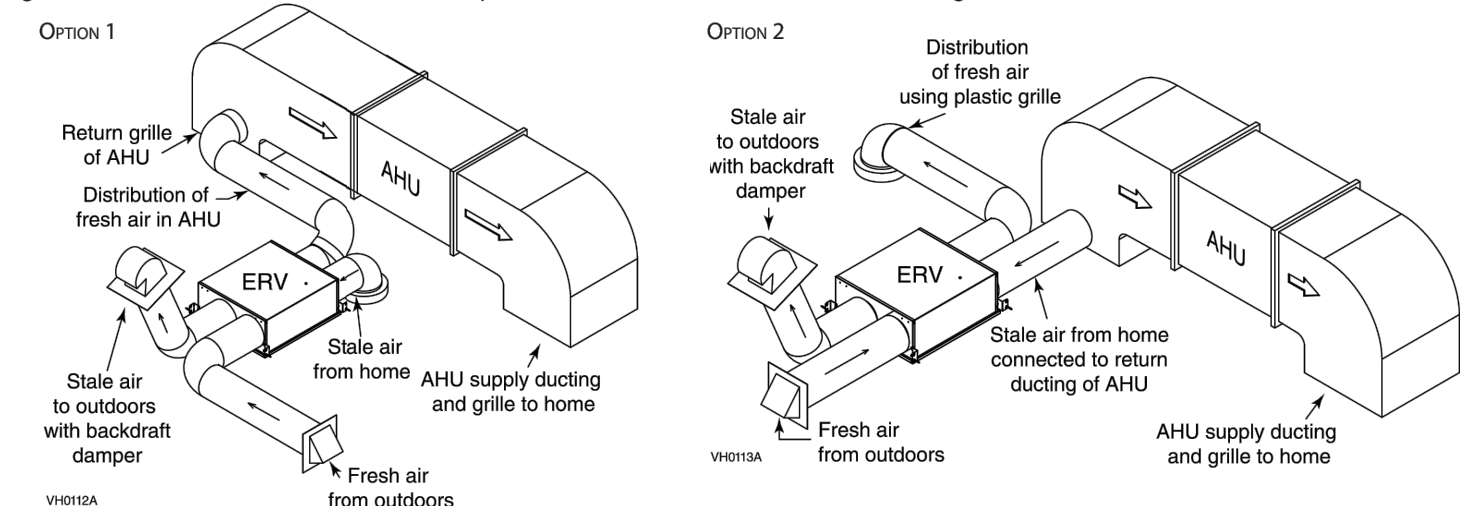
**Dimensions**



**Combining with an AHU**

Recommended configurations

Option 1 - When the distribution of fresh air from the ERV is connected to the return of an AHU (such as in the image below, on the left), static pressure where the fresh air from the ERV enters the AHU return ducting must be below 0.15 in.w.g. to ensure proper functioning of the built-in fresh air damper. If return duct static pressure exceeds the 0.15 in.w.g. threshold, an indirect connection combined with a supplemental return grille or "T" connection with the conditioned space should be used. See the User and installer guide for more details.

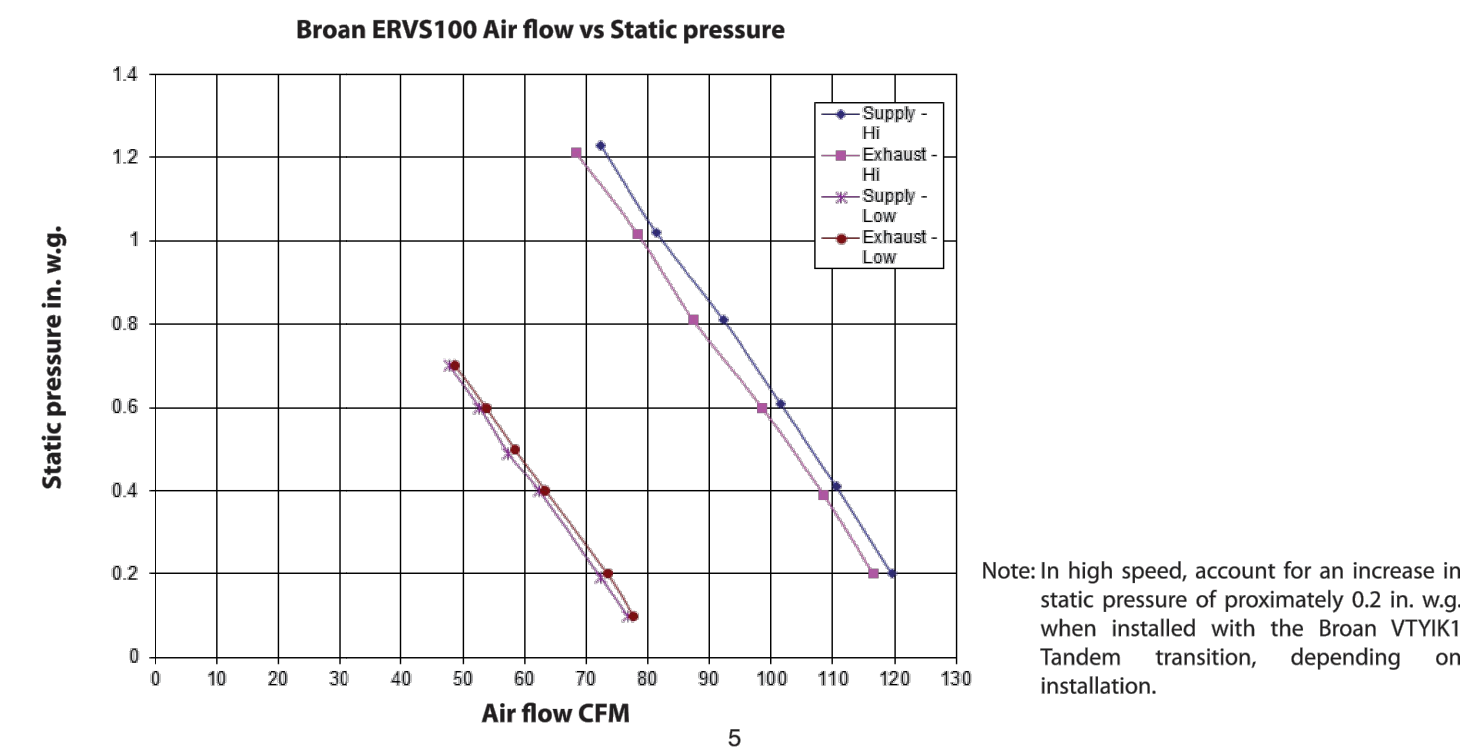


**Energy performance ERVS100**

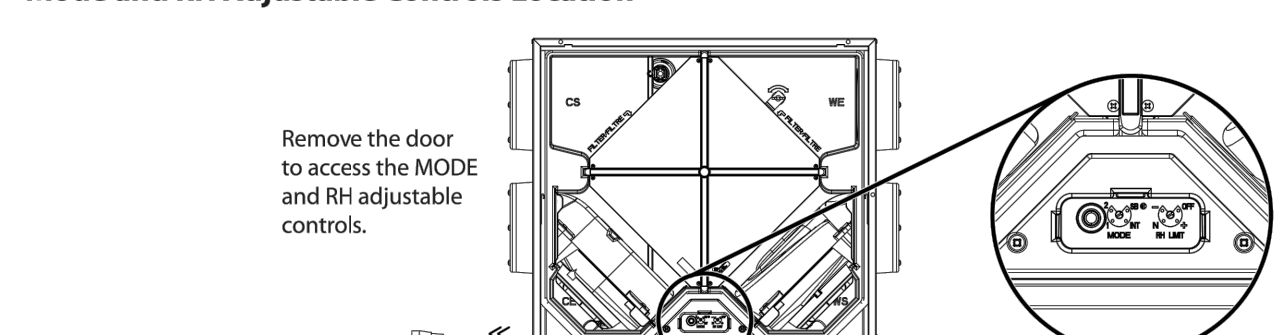
Supply Temperature	Net Air Flow	Power Consumed	Sensible Recovery Efficiency	Adjusted Sensible Recovery Efficiency	Apparent Sensible Effectiveness*	Latent Recovery/Moisture Transfer†	Total Recovery Efficiency	Adjusted Total Recovery Efficiency
°F	CFM	Watts	%	%	%	%	%	%
95	64	46			62	45	48	51
Cooling	95	106	103		55	35	38	41
32	64	46	64	68	71	51		
Heating	32	106	103	57	67	42		

\*Data not certified by HVI. \*\*Note: All specifications are subject to change without notice.

**Ventilation performance**



**Mode and RH Adjustable Controls Location**



Remove the door to access the MODE and RH adjustable controls.

**Relative humidity limit**

The ERVS100 monitors the outdoor air conditions (temperature and humidity level) every 10 minutes with a built-in sensor. When the outdoor conditions are above the set limits, the unit will limit the ventilation to 10 minutes per hour and come back to its previous setting when the conditions get back to the set limit. The accepted RH limit varies in function of the outdoor conditions and can be adjusted to 4 different positions:

Position	Description	RH* limit of distributed air	
		Outdoor temp. <73°F	Outdoor temp. ≥73°F
OFF	Relative humidity limit is deactivated.	-	-
+	Higher relative humidity limit.	Up to 60%	Up to 80%**
N	Factory set relative humidity limit.	Up to 55%	Up to 75%**
-	Lower relative humidity limit.	Up to 50%	Up to 70%**

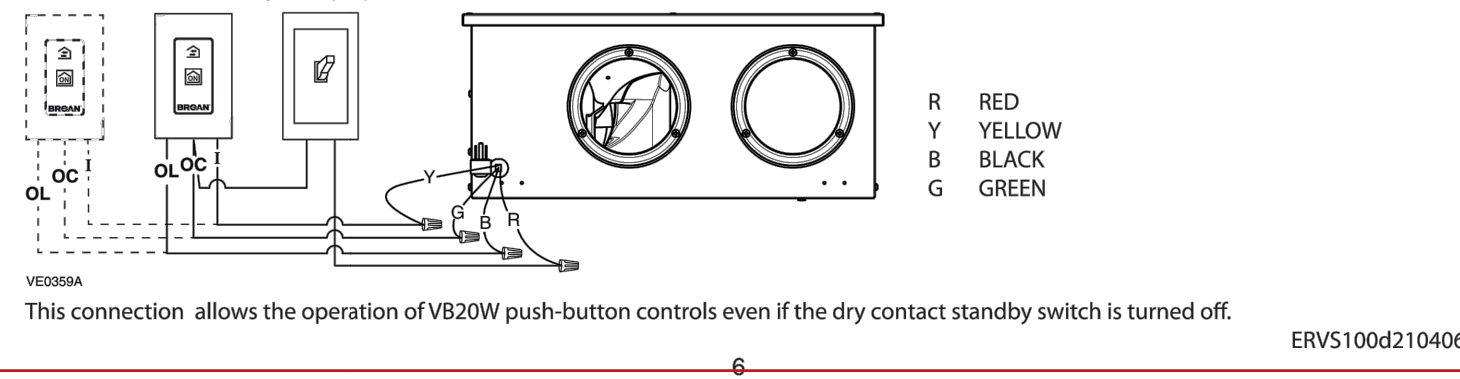
\* The RH limit of distributed air is calculated at 75°F. \*\* When the outdoor temperature is equal or above 73°F, the maximum relative humidity level accepted is higher considering that the air conditioning will partly dehumidify the incoming fresh air after it is distributed and mixed with the conditioned indoor air.

**Control Ventilation modes**

Position	Mode	Description
SB*	Standby	Unit is off. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.
INT	Intermittent	Unit works 20 minutes per hour in low speed. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.
1	Low Speed	Unit runs at 65 cfm. Unit can be activated in high speed by VB20W 20-minute push-button control, if applicable.
2	High Speed	Unit runs at 105 cfm. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.

\*Factory setting

**Optional controls wiring**



**EQUIPMENT CAPACITY VERIFICATION**

THE ERV IS RATED FOR 105 CFM AT 0.4" OF STATIC - DESIGN CONDITION OF WORST CASE UNIT IS 0.372" (HIGH SPEED) & 0.216" (LOW SPEED). MINIMUM REQUIRED VENTILATION FOR THE TWO BEDROOM UNIT IS 60 CFM AND A ONE BEDROOM IS 45 CFM.

MINIMUM EXH CFM FOR A 1 BATHROOM UNIT IS 45 CFM AND A TWO BATHROOM UNIT IS 65 CFM. THE ERV FOR ALL UNITS WILL OPERATE AT 65 CFM CONTINUOUS AND BOOST TO 105 CFM WITH WALL SWITCH (20 MINUTE TIMER).

1 ERV SUBMITTAL/DETAILS  
M6.01 NOT TO SCALE



FULL SIZE INTEGRAL ACCESS PANEL FOR ERV S-100 UNIT ACCESS DOOR IS ALSO CEILING ACCESS PANEL. UNIT INSTALLED IN A NON-RATED CEILING. ACCESS DOOR CONTAINS FAN CUT-OFF SWITCH (FAN DISCONNECT) TO ALLOW SERVICE OF ERV.

**PRIMEX HVAC VENTING** Product Specification Sheet

**WC Series** Intake and Exhaust Wall Cap Vents

**1. PRODUCT SUMMARY**

The Primex Wall Cap Series (WC) is ideal for exhaust and intake applications. This includes the through-wall exhaust of dryers, bathroom kitchen fans and stove vents, and the intake for furnaces and fresh air make-up vents. This rainscreen-compatible series comes in sizes ranging from 3-8 inches and in multiple colours.

**2. FEATURES & BENEFITS**

- Compatible with rainscreen applications via extended base, compensating for cavity between sheathing and cladding.
- Patented design eliminates leaky joints while maximizing water protection with one-piece molded base and built-in drip edge.
- Integrity of the building envelope is maintained via a removable hood for simple cleaning or replacement.
- Suitable for intake and exhaust applications.
- Over-sized flange ensures watertight installation.
- Made with UV-protected durable polymer resin.
- Highly resistant to mechanical impact including a built-in bird screen.
- Quick and easy installation.
- \* For dryer applications we recommend the no screen "NS" model.

**3. COLOURS**

- Snow White (01)
- Taupe (23)
- Black (25)
- Dark Grey (28)
- Light Grey (31)
- Tan (45)
- Dark Brown (68)

FOR MORE INFORMATION CONTACT:  
20160 92A Avenue Langley BC V1M 3A4 Canada  
1.877.881.7875 info@primexvents.com primexfits.com

**PRIMEX HVAC VENTING** Product Specification Sheet

**WC Series** Intake and Exhaust Vents

**4. SIZING/PART NUMBER**

W/BIRD SCREEN	W/O BIRD SCREEN	COLLAR SIZE	FREE AREA	DESCRIPTION	PKG
WC3	WC3NS	3"	7.7 sq. in.	For use with 3" dia. ducting	25/box
WC4	WC4NS	4"	9.5 sq. in.	For use with 4" dia. ducting	25/box
WC5	WC5NS	5"	19.6 sq. in.	For use with 5" dia. ducting	10/box
WC6	WC6NS	6"	28.3 sq. in.	For use with 6" dia. ducting	10/box
WC7	WC7NS	7"	38.5 sq. in.	For use with 7" dia. ducting	2/box
WC8	WC8NS	8"	46.8 sq. in.	For use with 8" dia. ducting	2/box

**5. TECHNICAL DRAWINGS**

(WC4 Shown)

FOR MORE INFORMATION CONTACT:  
20160 92A Avenue Langley BC V1M 3A4 Canada  
1.877.881.7875 info@primexvents.com primexfits.com

**alides** MAKE-UP AIR SOLUTIONS AIRLET™ TL98 Manually Adjustable Fresh Air Inlet

**DESCRIPTION**

The AIRLET™ TL98 manually adjustable fresh air inlet incorporates a unique, variable, precision-control damper that provides superior comfort control for the user. The damper is manually adjusted using a discreet slide control accessible from behind the front cover, which prevents unwanted tampering.

The interior grille is both attractive and multi-functional. The slightly arched grille face and horizontal lower slot take advantage of air currents to provide condensation protection. The superior air-distribution pattern ensures draft-free performance.

Every AIRLET™ TL98 includes an expandable wall sleeve, an exterior louvre, and a permanent, washable filter that is easily accessible for cleaning. The white color blends well with any decor, and the unit can be cleaned with a damp cloth. Pollen filters and sound-absorbing wall sleeves are also available.

**UNITS & ACCESSORIES**

P/N: 13 550	AIRLET™ TL98 Complete (4" x 8" Sleeve)
P/N: 13 201	4" Sleeve Expansion Section
P/N: 13 102	Pollen Filter (Optional)
P/N: 13 101	Standard Filter (Replacement)
P/N: 13 552-12	Sound-Absorbing Sleeve (For walls 5"-12" thick)

**WARRANTY**

The entire unit is guaranteed for three (3) years, from date of shipment, against all manufacturing defects, provided the material has been installed and operated per manufacturer's instructions and under normal conditions. Warranty is limited to the repair or replacement of the material upon its return freight paid to our factory. This warranty is not transferable and is limited to the original end user.

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2 SIDEWALL EXHAUST TERMINATION  
M6.01 NOT TO SCALE

3 STUDIO MAKEUP AIR  
M6.01 NOT TO SCALE

Project Title: NORTHBOUND 30 COLLABORATIVE

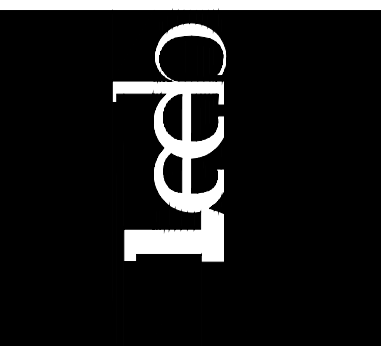
Drawing Title: MECHANICAL DETAILS

M7-6.01

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Project Title: NORTHBOUND 30 COLLABORATIVE  
NW 287th AVE PORTLAND, OREGON 97210

Revision	Date	Drawn by	MD	Project No.
1	06-07-22			A2172

# WhisperGreenSelect

VENTILATION FAN

## Specification Submittal Data / Panasonic Ventilation Fan

**Description**  
Customizable Ventilation Fan shall be low noise ceiling mount rated for continuous run. Fan shall be ENERGY STAR® rated and certified by the Home Ventilating Institute (HVI). Evaluated by Underwriters Laboratories and conform to both UL and cUL safety standards.

### Motor/Blower

- Enclosed DC brushless motor technology rated for continuous run.
- Fan ventilation rates shall be manually adjustable for 50-80-110 CFM.
- Powering shall be 120 volts and 60 Hz.
- Fan shall be UL listed for bathroom enclosure when used with a GFCI protected circuit and used in installed ceiling (TYPE I.C.).
- Fan equipped with a thermal cutoff fuse.
- Phenolic, permanently lubricated, plug-in motor.

### Hoisting

- Rust proof epoxy and polyester resin coating, 26 gauge galvanized steel body.
- Integrated dual 1" Ø diameter duct adapter.
- Built-in metal flange provides backing for penetrations through drywall as an Air Barrier, and assists with the decrease in leakage in the Building Envelope during blower door testing.
- Built-in backdraft damper.
- Adjustable and expandable installation bracket up to 24".

### Grilles

- Attractive design using Play Pro material.
- Attaches directly to housing with tension springs.
- Includes a motion sensor cap for use as a cover when the motion sensor Plug 'N Play™ module has not been selected.

### Warranty

- ALL Parts: 3 Years from original purchase date.
- DC Motor: 8 Years from original purchase date.

### Architectural Specifications

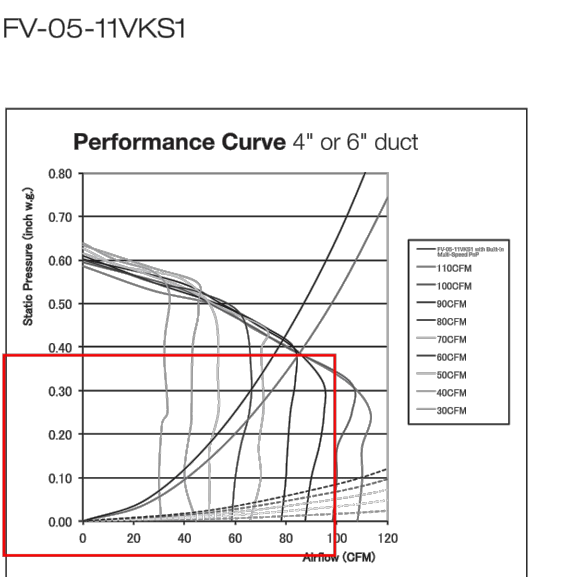
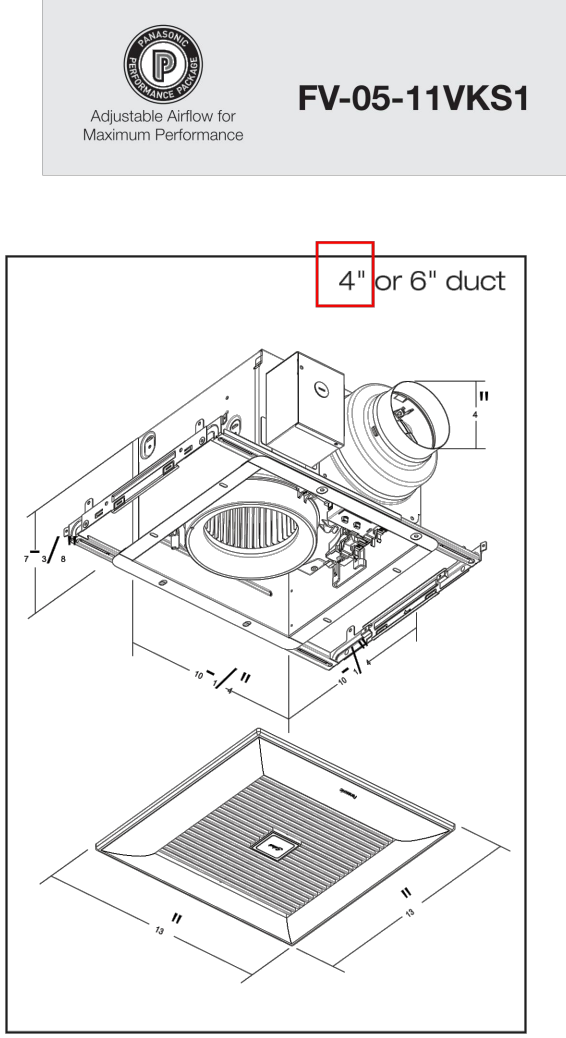
Customizable Ventilation Fan shall be ceiling mount, ENERGY STAR® rated type with multi-speed control (0, 50, 100 CFM, in 10 CFM increments) that shall be built-in with a high/low adjustable delay timer and activated by wall switch. Motion Sensor Plug 'N Play™ module or Condensation Sensor Plug 'N Play™ module. Equipped with built-in speed selector. Select from 0-10 CFM and no more than 0.33 gpcpd, as certified by the Home Ventilating Institute (HVI) at 0.1 w.g. with no less than 5000/110 CFM and no more than 0.300/40.0 h score at 25 w.g. Power Consumption shall be no greater than 3.0/5.0/6.8 watts at 0.1 w.g. and 0.5/1.0/1.5 watts at 0.25 w.g. ENERGY STAR® rated with efficiency of no less than 15.1/15.3/15.6 CFM/watt at 0.1 w.g. and the 18.4/17.2 CFM/watt at 0.25 w.g. The motor shall be enclosed with brushless DC motor engineered to run continuously. DC motor speed shall automatically increase when the fan senses static pressure to maintain selected CFM. Power rating shall be 120V/60Hz. Duct diameter shall be no less than 4". Inclusive of an integrated dual 1" or 2" duct adapter. **Plug 'N Play™ modules** provide up to two additional features: Select from Condensation Sensor, LED Night Light and DC Motor Speed. Fan shall be UL and cUL listed for bathroom enclosure when used with a GFCI protected circuit. Fan can be used to comply with ASHRAE 62.2, LEED, ENERGY STAR®, VAV, California, California Title 24 and WA Ventilation Code.

### DC Motor Technology

When fan senses static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised, which allows the fan to perform as rated.

For complete installation instructions visit [us.panasonic.com/ventfans](http://us.panasonic.com/ventfans)

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:



# WhisperGreenSelect

VENTILATION FAN

## Plug 'N Play™ Modules

Plug 'N Play™ modules provide up to two additional features (multi-speed is already built-in to FV-05-11VKS1). Select from Motion Sensor, Condensation Sensor and LED Night Light.

### FV-VS1VK1: Multi-Speed with Time Delay - N/A for this Fan, already built-in.

Allows you to select the proper CFM settings to satisfy ASHRAE 62.2 continuous ventilation requirements. The fan runs continuously at a pre-set lower level (0, 50, 100 CFM, in 10 CFM increments), then elevates to a maximum level of operation (0-10 CFM) when the wall switch is turned on, or when the motion sensor or Condensation Sensor module is activated. A high/low delay timer returns the fan to the pre-set CFM level after a period of time set by the user.

### FV-MSVK1: Motion Sensor

Automatically activates when someone enters the room. Once the settings have been applied, the fan becomes truly automatic. This module also activates a 20 minute delay off timer for the fan.

### FV-CSVK1: Condensation Sensor

Helps control bathroom condensation to prevent mold and mildew. Sensor technology detects relative humidity and temperature to anticipate dew point, automatically turning the fan on to control humidity. Built-in Relative Humidity (RH) sensitivity adjustment enables the tuning for moist conditions and for satisfying CalGreen requirements. When the condensation sensor is used in conjunction with multi-speed functionality, the fan will kick up to high speed when the condensation sensor detects moisture in the room. This module also activates a 20 minute delay off timer for the fan.

### FV-NLVK1: LED Night Light

A photocell automatically turns on the 1 watt LED night light when darkness is sensed in the room. High/Low brightness switch enables you to fine tune the photocell to work in conjunction with the darkness level of your bathroom. This module also activates an automatic 20 minute delay off timer for the fan.

Fan Specifications	WhisperGreen Select™ FV-05-11VKS1
Static Pressure (inches w.g.)	0.1   0.25   0.5   1.0   1.5   2.0   2.5   3.0   3.5   4.0   4.5   5.0   5.5   6.0   6.5   7.0   7.5   8.0   8.5   9.0   9.5   10.0
Air Volume (CFM)	110   110   180   180   260   260   340   340   420   420   500   500   580   580   660   660   740   740   820   820   900   900   980   980   1060   1060
Power Consumption (watts)	4.0   4.0
Energy Efficiency (CFM/watt)	27.5   27.5
Speed (RPM)	800   1000   1200   1400   1600   1800   2000   2200   2400   2600   2800   3000   3200   3400   3600   3800   4000   4200   4400   4600   4800   5000   5200   5400   5600
Current (amps)	0.18   0.18
MAX Current (amps)	0.22
Power Rating (Watt)	100W
ENERGY STAR rated	Yes

Panasonic Eco Solutions Company of North America  
Eco Products Division  
Two Riverfront Plaza  
Newark, NJ 07102  
[us.panasonic.com/ventfans](http://us.panasonic.com/ventfans)



**System No. W-L-8110**

ANSIUL1479 (ASTM E814)	CANULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
F Ratings — 0 Hr	FT Rating — 0 Hr
	FH Ratings — 1 and 2 Hr (See Item 1)
	FTH Rating — 0 Hr

**W-L-8110**

- Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/steel wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400, V400 or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
  - Studs** — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
  - Gypsum Board** — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening 5 in. (127 mm).
- Air Conditioning (AC) Line Sets** — AC line set consists of max two pipes or tubes (Item 2A), tubing insulation (Item 2B) and a thermostat cable (Item 2C). The AC line sets shall be rigidly supported on both sides of the wall assembly.
  - Metallic Penetrants** — A max of two pipes or tubes to be installed in each AC line set. The following types and sizes of through penetrants may be used:
    - Steel Pipe — Nom 3/4 in. (19 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
    - Iron Pipe — Nom 3/4 in. (19 mm) diam (or smaller) cast or ductile iron pipe.
    - Copper Pipe — Nom 3/4 in. (19 mm) diam (or smaller) Regular (or heavier) copper pipe.
    - Copper Tube — Nom 3/4 in. (19 mm) diam (or smaller) Type L (or heavier) copper tube.
  - Tube Insulation - Plastics** — Nom 1 in. (25 mm) thick acrylonitrile butadiene/polyvinyl chloride (ABIPVC) flexible foam furnished in the form of tubing. The tube insulation may be installed on one max 3/4 in. (19 mm) diam pipe or tube in each AC line set. The space between the insulated and uninsulated pipes or tubes within each AC line set shall be 0 in. (point contact). See Plastics (CMF22) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94V-0 may be used.
  - Cable** — One 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials may be installed with each AC line set.

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Page: 1 of 2

**System No. W-L-8110**

**W-L-8110**

- Firestop Device** — Firestop device consists of a corrugated steel tube with flanges and gasketing material. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device flanges are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm).
- Fill Void or Cavity Material - Plug** — Nom 4 in. (102 mm) plug sized for the firestop device (Item 3) friction fit within the sleeve flush with the end of the sleeve on both sides of the wall assembly. Plug cut to fit around the line set and installed tightly within the sleeve. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-PL Firestop Plug

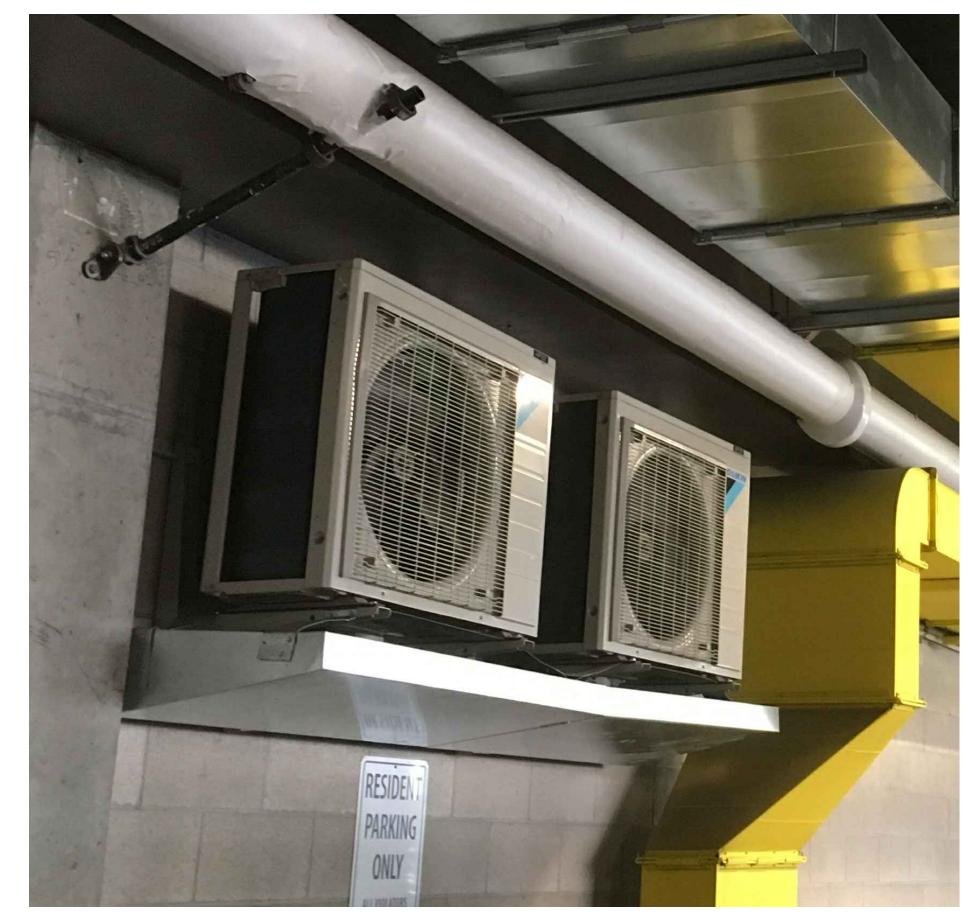
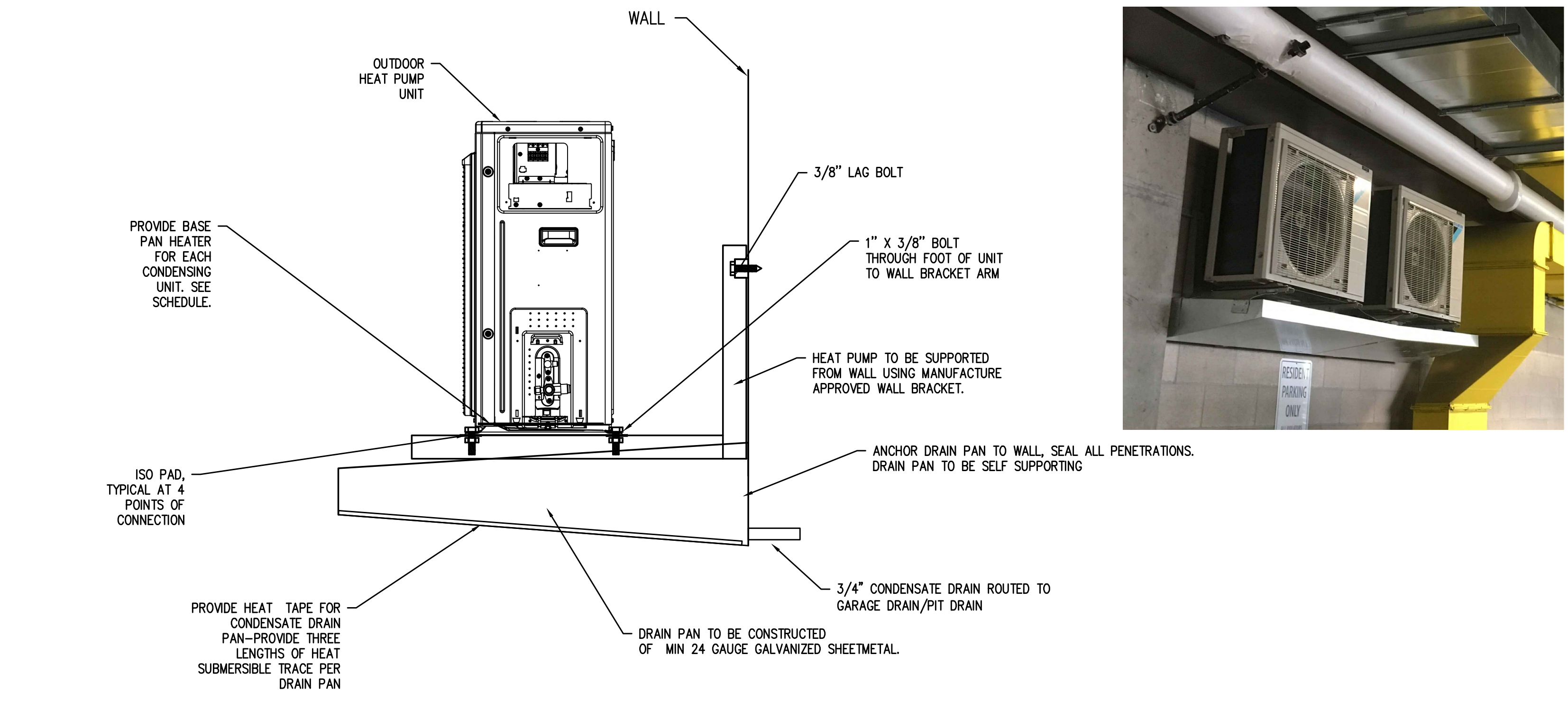
\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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1 BATH FAN SUBMITTAL  
M6.02 NOT TO SCALE

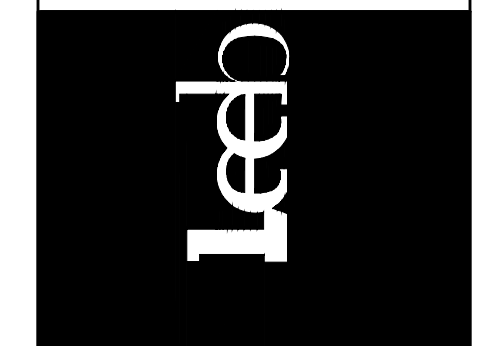
3 SINGLE HVAC LINESET PENETRATION  
M6.06 SCALE: DETAIL



2 HEAT PUMP WALL BRACKET  
M6.01 SCALE: DETAIL

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Project Title:  
**NORTHBOUND 30 COLLABORATIVE**  
NW 28TH AVE PORTLAND, OREGON 97210

Revision:	Date:	Drawn by:	Project No.:
	06-07-22	MD	A212

MECHANICAL DETAILS

M7-6.02